PROJECT MANUAL

for

ROSAMOND HIGH EARLY COLLEGE CAMPUS DANCE ROOM & WEIGHT ROOM MODERNIZATION

2925 West Rosamond Blvd.
Rosamond, CA 93560

SOUTHERN KERN UNIFIED SCHOOL DISTRICT
2601 Rosamond Blvd.
Rosamond, CA 93560

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Project No. 3139

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DSA No. 03-125472
DSA File No. 15-H10

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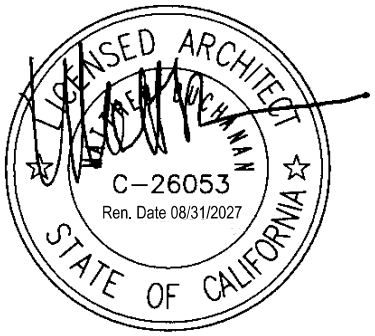

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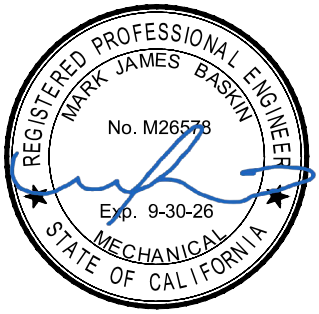

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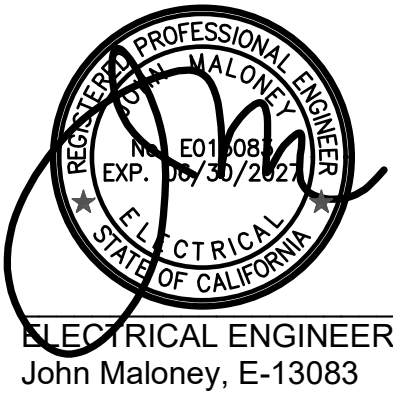

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REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 04/30/2026

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SUMMARY OF WORK

1.00 GENERAL

1.01 SUMMARY

A. The Project consists of design and construction of the following items:

1. Demolition of existing boys and girls locker room area, showers and restrooms, boys and girls coach and storage rooms.

2. Demolition of existing equipment in boiler room which will include storage tank, water heater and all components associated with this equipment.

3. Replace girls locker room with a new dance room, changing room, accessible restroom and storage room.

4. Replace boys locker room with new weight room and accessible restroom.

5. Upgrade fire alarm for the new dance room and weight room only.

6. Addition of new HVAC units for the dance room and weight room only.

7. Structural anchorage of new equipment.

8. Removal and replacement of existing areas of slab on grade due to existing floor drains throughout the locker areas.

9. Voluntary improvements of the existing concrete tilt-up wall and out of plane anchorage to the existing roof diaphragm.

1.02 PHASING/CONTRACTOR'S USE OF PREMISES

A. Move stored products, which interfere with operations of District or other contractors.

B. Obtain and pay for use of additional storage, work areas or parking needed for operations or Contractor's employees.

C. Use of site: Limit to areas directed by the District.

1. Allow District access to maintain and operate other existing facilities.

2. Permit unimpeded access by firefighting, law enforcement agencies and rescue equipment.

3. Access to and egress from construction site shall be in strict conformance to prearranged routes approved by the District, with the understanding that curtailment of traffic or revision of access routes may be required on short notice if the District's operations mandate such changes because of excessive noise, or problems with safety, service, or supply.

D. Partial District's occupancy: The District reserves the right to place and install equipment in areas of the Project prior to Substantial Completion provided it doesn't interfere with normal completion of Work. This partial occupancy shall not constitute acceptance of the Work.

1.03 WORK NOT IN CONTRACT

A. The following will be provided by the District under separate contracts.

1. Encapsulation, removal and disposal of asbestos, toxic substances and other hazardous materials.

2. Tests and inspections specified to be provided by the District in the Contract Documents.

3. Items noted NIC (Not In Contract) on the Drawings or in the Specifications.

4. Items noted OFCI (Owner Furnished Contractor Installed) on the drawings or the specifications shall identify those items that will be purchased and delivered to project by the Owner but for which the Contractor(s) shall be responsible for all labor and materials necessary to fully and properly install the supplied items.

B. When work of this Contract requires the Contractor to make allowance for the above in his work, and to provide supports, power, conduits, stub-outs and other services to these items, the drawings, manufacturer's data and other information necessary for Contractor's work will be provided by the District upon request.

1.04 DEFINITIONS

A. In addition to other definitions included in these Specifications, the following applies to the Work:

1. Approved, approved equal, or equal, mean as approved and accepted by the Architect and District.

2. As necessary means essential to completion of Work.

3. As required means as required by Contract Documents.

4. As selected, as approved, as directed or words of similar import mean as selected by, as approved by, or as accepted by the Architect. No implied meaning shall be interpreted to extend Architect's responsibility into the Contractor's area of Contractor's supervision.

5. As shown, as detailed, as indicated and words of similar import mean as indicated on the Drawings.

6. Building Department and Authorities Having Jurisdiction: All agencies, individually or collectively, charged by statute with administration/ enforcement of requirements of the Building Code at Project location.

7. Concealed means embedded in masonry, concrete or other construction, installed within furred spaces, within a wall/partitions or above suspended ceilings, in trenches, in crawl spaces, or in enclosures.

8. Equipment means a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

9. Exposed means not installed underground or concealed as defined above.

10. Fabricated means items specifically assembled or made out of selected materials to meet individual design requirements for the Project.

11. Furnish (materials) means to supply and deliver to the Project ready for installation and in operable condition.

12. Include/including means include/including, without limitation.

13. Install (services or labor) means to place in final position, complete, anchored, connected, and in operable condition.

14. Interior means a space completely enclosed by walls, solid door(s), floor and ceiling.

15. Exterior means a space which does not meet the definition for "interior" above.

16. Manufactured applies to standard units usually mass-produced.

17. Manufacturer's directions, instructions, recommendations, specifications means manufacturer's written directions, instruction, recommendations, specifications.

18. Materials are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form part of Work.

19. Named products are items identified by manufacturer's product name, including make or model designation, indicated in manufacturer's published product literature current as of the date of the Contract Documents.

20. Owner furnished/Contractor installed (OFCI) means that some equipment may be Owner furnished and delivered to site by District and installed on site by Contractor under this Agreement.

21. Owner provided (OP) means items or equipment that shall be furnished and installed under separate contract by Owner/District.Product(s) means materials, systems, and equipment, and terms of similar intent.

22. Product(s) means materials, systems, and equipment, and terms of similar intent.

23. Provide means to supply, fabricate, deliver, place, and connect, complete in-place, ready for operation and use. When neither furnish, install nor provide is stated, provide is implied.

24. Division means Division of these Specifications except where the obvious intent is the act or process of dividing. Divisions are groups of related Sections.

25. Section means Section of these Specifications, except where the obvious intent is one of several components, a piece. Section is usually a basic unit of Work.

26. Shall is mandatory.

27. Submit, submittal, submission mean submit to Architect for review, unless otherwise stated.

1.05 TITLING AND ARRANGEMENT

A. Article, Paragraph and subparagraph titles and other identifications of subject matter in Specifications are intended as an aid in locating and recognizing various requirements in beginning words of a sentence or where title establishes subject, titles are subordinate to and do not define, limit, or otherwise restrict Specification text.

B. Underlining, bolding or capitalizing of words in the text does not signify or mean that such words convey special or unusual meaning.

C. Specification text governs over titling and shall be understood to be and interpreted as a whole.

D. The order of articles, paragraphs, subparagraphs, and sub-subparagraphs in the Specifications text is defined by the sequence of indentations.

1.06 INTERPRETATION

A. Unless otherwise stated in the Contract Documents, technical words and abbreviation contained in the Contract Documents are used in accordance with commonly understood construction industry meanings; and non-technical words and abbreviations are used in accordance with their commonly understood meanings.

B. Contract Documents may omit modifying words such as "all" and "any," and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement. Use of the word "including," when following any general statement, shall not be construed to limit such statement to specific items or matters, whether or not non-limiting language (such as "without limitation," "but not limited to," or words of similar import) is used with reference thereto, but rather shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such general statement.

C. Whenever context so requires, use of the singular number shall be deemed to include the plural and vice versa.

1. Each gender shall be deemed to include any other gender, and each shall include corporation, partnership, trust, or other legal entity whenever context so requires.

2. Captions and headings of various subdivisions of Contract Documents are intended only as a matter of reference and convenience and in no way define, limit, or prescribe the scope or intent of Contract Documents or any subdivision thereof.

END OF SECTION

SECTION 01 32 16
CONSTRUCTION SCHEDULE

1.00 GENERAL

1.01 SECTION INCLUDES

A. Construction Schedule procedures, preparation, submittal, updates, and revisions.

1.02 RELATED SECTIONS

A. Section 01 33 23: Submittals.

B. Section 01 77 20: Project Record Documents.

1.03 SCHEDULE

A. The construction of this project will be planned and recorded with a conventional Critical Path Method (CPM) schedule. The schedule shall be used for coordination, monitoring, and payment of all work under the contract including all activity of subcontractors, vendors, suppliers, and for all submittals.

B. Contractor is responsible for preparing the schedule. All costs incurred by Contractor in preparing the schedule shall be borne by Contractor as a part of its responsibility under this contract.

1.04 PROCEDURES

A. Baseline Construction Schedule

1. Before proceeding with any work on site, Contractor shall prepare, submit, and receive District's approval of a Baseline Construction Schedule. This schedule shall provide a detailed breakdown of activities scheduled for the first 90 days of the project and shall include mobilization, submittals, procurement, and construction.

2. No contact work may be pursued at the site without an approved Baseline Construction Schedule or an approved CPM schedule.

B. Within forty-five (45) calendar days after date of Notice to Proceed, Contractor shall submit, for review, a Detailed Project Schedule setting forth all requirements for complete execution of work.

C. Preparation of Detailed Project Schedule

1. The construction time, for the entire project or any milestone, shall not exceed the specified contract time. In the event that any milestone date or contract completion date is exceeded in the schedule, logic and/or time estimates will be revised.

2. Following the District's review, if revisions to the proposed schedule are required, the Contractor shall do so promptly. The schedule must be finalized within 60 days of the Notice to Proceed. Failure to finalize the schedule by that date will result in withholding all contract payments until the schedule is finalized.

D. Simultaneously with each submittal of Progress Payment Request, Contractor shall deliver to the District an updated Detailed Project Schedule reflecting work progress as of end of previous reporting period. Each such Schedule shall indicate actual progress to date in execution of work, together with a projected schedule for completion of work.

E. All Schedule submittals are subject to review and acceptance by the District. The District shall withhold progress payments until Contractor submits a Detailed Project Schedule acceptable to the District.

F. Concurrent with the District's acceptance of Contractor's submitted Detailed Project Schedule, shall be Contractor's signature of acceptance.

1.05 PREPARATION GUIDELINES

A. Work of this Contract shall be scheduled and progress monitored using a bar chart, although any of the CPM network type scheduling systems, including precedence diagramming or arrow are acceptable. Scheduling system shall show the sequence and interdependence of all activities required for complete performance of all items of work under this contract, including all approvals, shop drawings and other submittals and approvals, and fabrication and delivery activities. Scheduling system shall indicate all inter-relationships between trades and suppliers.

B. Level of detail indicated in schedule shall be equal to or greater than that provided by Table of Contents of Contract Technical Specifications, including any addenda. Duration and events indicated on schedule shall conform to phasing set forth in the Contract and shall show any area or building within a particular phase. Schedule shall indicate any and all Contract "milestone events" and other milestones agreed to by the District, but no other manually-imposed dates will be accepted unless approved.

C. Detailed Project Schedule shall represent a practical plan to complete work within time requirements of the Contract.

1. The Contractor may submit a Detailed Project Schedule depicting completion of the Work in a duration shorter than the Contract Time; provided that such Detailed Project Schedule shall not be a basis for adjustment to the Contract Price in the event that completion of the Work shall occur after the time depicted therein, nor shall such Detailed Project Schedule be the basis for any extension of the Contract Time.

2. A schedule found unacceptable by the District shall be revised by Contractor and resubmitted.

D. Detailed Project schedule shall clearly indicate sequence of construction activities, grouped by applicable phase and sorted by areas, buildings, or facilities within phase, and shall specifically indicate:

1. Start and completion of all items of work, their major components, and interim milestone completion dates, as determined by Contractor and the District.

2. Activities for procurement, delivery, installation of equipment, materials, and other supplies, including:

   a. Time for submittals, re-submittals, and reviews. Include decision dates for selection of finishes, if applicable.

   b. Time for fabrication, and delivery of, manufactured products for work.

   c. Interdependence of procurement and construction activities.

   d. As applicable, dates for testing, balancing equipment, and final inspection.

E. Schedule shall be in sufficient detail to assure adequate planning and execution of work.

1. Each activity shall range in duration no longer than two (2) weeks and shall be total of actual days required for completion, and shall include consideration of normal weather impact on completion of that activity.

2. The activities are to be described so that the work is readily identifiable and the progress of each activity can be readily measured. For each activity, Contractor shall identify the trade or subcontractor performing the work, the duration of the activity in work days, the manpower involved by trade, the equipment involved, the location of the work, and a dollar value of the activity. The dollar value assigned to each activity is to be reasonable and based on the amount of labor, materials, and equipment involved. When added together, the dollar value of all activities are to equal the contract price.

3. Schedule shall be suitable, in judgement of the Architect, to allow monitoring and evaluation of progress in performance of work; it shall be calendar time-scaled and, at a minimum, in a Bar Chart format.

4. Activities shall include:

   a. Description; what is to be accomplished and where.

   b. Workday duration.

   c. Scheduled activities shall indicate continuous flow, from left to right.

5. Identify days per week and shifts per day worked; also, non-work days and holidays.
6. For all schedules submitted, Contractor shall provide the following:

a. Computerized sorts by:

(1) Total Float
(2) Early Start
(3) Area Sort
(4) Trade responsibility

b. 60-day look ahead bar charts by early start.

c. A narrative explaining progress to date on the project, work required in the succeeding update period, a description of the critical path, and comments concerning potential problem areas.

d. Contract will submit four copies of each of the above.

F. Failure to include any element of work required for performance of this Contract shall not excuse Contractor from completing work required to comply with the Contract Documents, notwithstanding acceptance of Construction Schedule.

G. Submittal of Construction Schedule shall be understood to be Contractor's confirmation that the schedule meets requirements of the Contract Documents, and that work will be executed in sequence indicated in schedule.

1.06 REVIEWS, UPDATES, AND REVISIONS

A. The District will review and return Contractor's Detailed Project Schedule, with summary comments, within Seventeen (17) calendar days. If revisions are required, Contractor shall resubmit Schedule within fourteen (14) calendar days following receipt of the District's comments.

B. After Contractor and the District agree to a final schedule, it will become the Project Construction Schedule and considered part of the Contract Documents. No changes to Schedule will be allowed unless mutually agreed upon with the District.

C. Contractor shall analyze and update the Detailed Project Schedule:

1. As part of monthly payment application, Contractor shall submit to and participate with the District in a schedule review to include:

a. Actual completion dates for work items completed during report period.

b. Actual start dates for work items started during report period.

c. Estimated remaining duration for work items in progress, which will not exceed original duration for activity.

d. Estimated start dates for work items scheduled to start during month following report period, if applicable.
e. Changes in duration of work items.

f. A summary bar chart schedule, organized first by work segment plan, and then by area (building number or other appropriate subdivision) shall show construction progress in each area. The previous schedule shall be included in this report to compute the current performance with the original planned sequence of work.

2. In case of a change to Contractor's planned sequence of work, Contractor shall include a narrative report with updated progress schedule which shall include, but not be limited to, a description of problem areas, current and anticipated delaying factors, and any proposed revisions for a recover plan.

3. All change orders affecting this schedule shall be clearly identified as a separate and new activity.

4. Review of Detailed Project Schedule will not relieve Contractor of responsibility for accomplishing all work in accordance with the Contract Documents.

D. Updates: The Contractor shall submit to the District, with each payment application, an up-to-date Detailed Project Schedule to include following:

1. Work Item Report: Detailing work items and dependencies as indicated on Bar Chart.

2. Separate listing of activities completed during reporting period.

3. Separate listing of activities which are currently in progress, indicating their remaining duration and percentages completed.

4. Separate listing of activities which are causing delay in work progress.

5. Narrative report to define problem areas, anticipated delays, and impact on Detailed Project Schedule. Report corrective action taken, or proposed, and its effect, including effect of changes on schedules of separate contractors.

6. Resolution of conflict between actual work progress and schedule logic: when out-of-sequence activities develop in the Schedule because of actual construction progress, Contractor shall submit a revised schedule to conform to current job sequence and direction.

E. If, according to current updated Detailed Project Schedule, the District determines Contractor is behind the Contract completion date or any interim milestone completion dates, considering all time extensions to which Contractor is entitled, Contractor shall submit a revised schedule, showing a workable plan and a narrative description to complete project on time. In accordance with Article 1.06, Paragraph C-2.

1. The District shall withhold progress payments until a revised schedule, acceptable to the District, is submitted by Contractor.

F. Scheduling of change or extra work orders is responsibility of Contractor.

1. Contractor shall revise Detailed Project Schedule to incorporate all activities involved in completing change orders or extra work orders and submit it to the District for review.

G. If the District finds Contractor is entitled to extension of any completion date, under provisions of the Contract, the District's determination of total number of days extension will be based upon current analysis of Construction Schedule, and upon data relevant to extension.

H. Contractor acknowledges and agrees that delays to non-critical activities will not be considered a basis for a time extension unless activities become critical. Non-critical activities are those activities which, when delayed, do not affect an interim or final Contract completion date.

I. Any claim for extension of time shall be made in writing to the Architect not more than seven (7) days after commencement of delay; otherwise, it shall be deemed finally waived for all purposes. Contractor shall provide an estimate of probable effect of such delay on progress of work as part of claim.

1.07 CONTRACTOR'S RESPONSIBILITY

A. Nothing in these requirements shall be deemed to be a usurpation of Contractor's authority and responsibility to plan and schedule work as Contractor sees fit, subject to all other requirements of Contract Documents.

B. Contractor shall provide at all times sufficient competent labor, materials, and equipment to properly carry on work and to insure completion of each part in accordance with Construction Schedule and within time agreed.

C. Contractor shall be responsible for ensuring that all submittals to the District are accurate and consistent. Damages, including extra time and cost, caused by inaccuracies from Contractor will be compensated by Contractor.

1.08 SUSPENSION OF PAYMENTS

A. Initial Submittal: The District has the right to withhold progress payments until Detailed Project Schedule is accepted by the District.

B. Update Submittals: The District has the right to withhold progress payments if Contractor fails to update and submit Detailed Project Schedule and reports as required by the District.

1.09 RECORD COPY

A. At completion of work items, submit Detailed Project Schedule reflecting "as-built" sequence.

1.10 FORM OF SUBMITTAL

A. All Detailed Project Schedule submittals shall be transmitted with a Letter of Transmittal and shall include three (3) hard copies and one (1) electronic copy.

2.00 PRODUCTS

Not used.

3.00 EXECUTION

Not used.

END OF SECTION

SECTION 01 33 23
SHOP DRAWINGS AND SAMPLES

1.00 GENERAL

1.01 SUMMARY

A. This Section establishes general requirements for shop drawings and samples, and supplements similar provisions found elsewhere in the Contract Documents.

1.02 GENERAL REQUIREMENTS

A. Prior to submission to Architect, Contractor to check all shop drawings, brochures, and other such construction data for quantity, size, and dimensions. Architect will answer questions raised by Contractor, and will make determination regarding quality of material and equipment, design and arrangement decisions, and color selections, but will not be responsible for quantity, size, or dimensional errors on shop drawings. In cases of omission and obvious error, and in cases of conflict, either between details on Contract Drawings or Specifications, such questions shall be brought to the Architect's attention, and Architect will give prompt answers to such questions.

1. Colors and textures to be selected will be selected from all available colors and textures, regardless of price ranges. For instance, where the first manufacturer listed has 20 colors or color ways available, that is the minimum number that shall be available for selection. Products of other manufacturers may be submitted, but the cost of colors considered special shall be included in the Contract Sum if their number is less than 20. When colors or textures are custom from any manufacturer, they will be so identified.

B. Carefully review subcontractors' submittals for completeness and correctness and stamp and acknowledge such review on submittals, prior to transmitting them to Architect.

C. Close adherence to these requirements is necessary to avoid delay in processing of shop drawings by the Architect. Deviation from these requirements may result in rejection of the submittal. Contractor will be held responsible for delays resulting from tardy and improper submittals.

D. Obtain approvals from required agencies, prior to submittal to the Architect, for all revisions, substitutions of materials or design, including all structural deviation from the design as shown and specified.

1.03 SUBMITTALS

A. Shop drawings, data, specifications, etc. (District may request more):

1. PDF by email.

B. Samples, brochures, etc. (District may request more):

1. 3 hard copies.

1.04 SUBMITTAL PROCEDURES

A. Identify submittals with job name, location, and Architect's job number. They shall be reviewed, stamped with an approximately 3 in. x 1/2 in. identification stamp, and have the signed approval of Contractor, prior to submission to Architect. Each sheet of drawings, both prints and transparencies, shall be so identified and signed.

B. Bound sets of brochures, catalog sheets, specifications and materials lists shall include an index sheet, completely identifying the entire content of the submittal in sequential order. At his option, the Contractor may identify, stamp and sign only this index sheet.

C. In lieu of signing each brochure, Contractor may indicate on Letter of transmittal that he has reviewed and approved all material included. This does not eliminate requirements for identification stamp information.

D. Architect will return to the Contractor one copy of the vellum transparency of drawings and 1 brochure, stamped and signed with corrections, if any. If the Contractor desires additional copies returned, then he must so request and submit the extra copies.

E. Handle re-submittals the same as the original submittals, but identify as such and use the Architect's original shop drawing number.

F. Accompany each submittal by a letter of transmittal containing a complete itemized and numbered list of the submitted material together with the subcontractor's name. A separate Letter of transmittal shall accompany each submittal from different subcontractors and different categories (trade and building units).

G. Segregate and submit shop drawing submittals separately for each building unit comprising entire Project. Submittals shall be made as though each building unit and the site are separate projects.

1.05 SAMPLES

A. Labeling: Identify each sample with at least a 3 in. by 4 in. label with the following information.

1. Complete identification stamp information in accordance with submittals procedure in paragraph 1.04, A.

2. Name, finish, and composition of the material.

3. Location or intended use on the Project.

B. Size of samples: Of sufficient size to show all salient features of material or item, and which are truly representative of the extremes of variation in color, texture, finish, and construction to be expected in installed work. Samples of framed materials shall include a corner joint. Allow space for 5 in. by 3 in. Architect's review stamp.

C. Mock-ups: Specifications may require mock-ups of proposed construction elements, using actual materials and full-size components. Such mock-ups shall be included in the Contract Sum.

D. Review of samples: After review, samples will be stamped or labeled to indicate their review, and one sample will be returned to the Contractor.

1. Samples retained by the Architect will constitute the standard of quality and appearance of all materials of the type represented by the sample.

2. When samples are rejected, Contractor will be given reasons for rejection and shall resubmit samples until, in the opinion of the Architect, they comply with Contract requirements.

E. At the option of the District or Architect, samples may be subject to testing. In such event, additional samples as may be required shall be supplied by the Contractor at no additional cost.

END OF SECTION

SECTION 013513
SPECIAL PROJECT PROCEDURES

1.00 GENERAL

1.01 SUMMARY

A. General: Buildings will not be occupied while the work of this Contract is performed.

B. Existing conditions:

1. Contractor shall accept the site in the condition in which they exist at the time he is given access to begin work.

2. Before starting work, make a detailed survey of existing conditions, verify governing dimensions at the premises against the Drawings, and examine adjoining work on which the work of this Contract is dependent.

3. No "Extra" or additional compensation will be allowed on account of differences between actual measurements and dimensions shown.

4. Submit differences discovered during Work to Architect for interpretation before proceeding with associated work.

C. Protection:

1. While work of this Contract is in progress, protect adjacent areas, facilities, grounds, and contents, whether private or public, from damage or harm due to the work of this Contract.

2. Cover and protect all surfaces of areas turned over to Contractor for the Work as required to prevent soiling or damage by dust, dirt, water, fumes or otherwise, and protect other areas where Work is performed in the same manner, all as deemed adequate by the District. Prior to District's re-occupancy of any such area, clean all surfaces according to cleaning instructions as may be specified in other Sections or issued by the District.

3. Conform to following requirements where welding is performed in or on the buildings.

a. Protection during welding: Conform to CAC. Further protect occupants and the public with portable solid vision barricades around locations where welding is performed plus sign warning against looking at welding without proper eye protection, or equivalent.

b. Fire extinguishers: Maintain a fully charged UL labeled, minimum 10 lbs. ABC fire extinguisher at each location where welding is performed.

c. Welding smoke control: Verify locations of existing smoke detectors. Perform welding operations by methods that produce the minimum feasible smoke and fumes. Furnish portable type smoke collection and ventilating equipment as required to prevent smoke and fume nuisances. Notify the District at least 48 hours in advance if temporary deactivation of smoke detector is required to prevent false alarms from welding. District will permit deactivation of detectors only for the time welding is actually in progress.

4. Fire prevention:

a. Ensure that flammable solvents are not being used in the area. Maintain a safe distance between place of welding and source of flammable solvents.

b. In addition, examine existing construction and backing for all combustible materials and finishes and for conditions where heat conduction in metals may bring adjoining materials to ignition temperature.

c. Use positive fire prevention measures including, without limitation, removal and reinstallation of combustible materials, installation of temporary shields and/or heat sinks, and all other necessary measures.

5. No utility services, such as water, gas, sewers, electricity, telephone, communication, and fire protection system serving the Buildings or parts thereof, shall be interrupted without prior written approval of the District, and other authorities having jurisdiction.

6. Damage caused by the Contractor to existing structures, grounds, pavements, utilities or flora, or work done by others, shall be repaired by the Contractor at his expense and left in as good condition as existed before the damaging, except where such existing work is shown to be removed, or replaced by new work.

D. Access:

1. During the life of the Contract, maintain access to site, and within the site to the buildings for fire-fighting equipment, ambulance and police vehicles.

2. Required accessways and other accessways not required but so designated by the District or Contract Documents shall not be blocked so as not to interfere with access to adjacent areas, facilities or new work area and cause least possible interference with activities of other contractors, District's personnel or the public.

1.02 SURVEY AND RE-SURVEY OF EXISTING CONDITIONS

A. Intent of Drawings is to show existing site and buildings conditions with information developed from original construction documents, field surveys, and District's records, and to generally show the extent and type of demolition required to complete the Work.

1. Information shown on the Drawings is not a guarantee of existing conditions.

2. Contractor/Bidder is invited to survey the site of the work after making arrangements to do so with the District.

B. After award of Contract and before starting work, the Contractor, the District's representative, and the Architect shall together make a thorough survey of the existing facilities, and areas to be used for staging, storage or accessways to or from the Work.

1. Contractor shall list, and photograph if he/she desires, existing conditions not requiring alterations, shall note discrepancies between Drawings and existing conditions, and shall designate areas of storage and routes of access agreed upon by the District.

2. Where necessary, Architect will issue clarifications and instructions.

3. Do not proceed where such conflicts or discrepancies occur prior to receipt of Architect's instructions.

C. At a mutually agreed upon time before completion of Work, the Contractor, the District and Architect shall re-survey the same areas.

1. Contractor shall furnish a report on conditions then existing compared with conditions as first noted.

2. The report of re-survey shall be signed by the Architect, and forwarded by the Contractor to the District.

3. Damage indicated in the report that was caused by the Contractor, or anyone employed by or under contract to the Contractor, shall be repaired by the Contractor at his expense and left in as good condition as existed before the damaging.

1.03 RESTRICTIONS

A. Noise control: Exercise caution to prevent generation of unnecessary noise and keep work-generated noise levels to minimum possible. Do not exceed CAL/OSHA standards at any time. Discontinue noise producing operations, when requested by the District, and reschedule at a mutually acceptable time.

1. Equip internal combustion engines with suitable mufflers. Do not use internal combustion engines in enclosed spaces, including the buildings, without the District's written approval.

2. Mount rolling equipment on pneumatic tires.

B. Dust control:

1. Control dust by methods acceptable to the District and the C. M.

2. Provide dust-tight partitions to prevent dust escaping into other parts of the building where work is not in progress.

3. Assume liability for claims related to flying dust and debris.

C. Water control:

1. Control the use of water to prevent damage to the existing facilities and site improvements to remain. Provide wet vacuum equipment where water, such as waste cooling water from concrete sawing, is used in and adjacent to existing buildings.

2. Provide impermeable floor coverings and suitable dams to prevent damage by water, and immediately clean-up and remove all surplus water, and water spilled in non-working areas.

D. Security: Coordinate security with the District.

1. Take all necessary precautions to keep trespassers out of work and demolition areas.

2. Properly secure work and demolition areas from entry when work is not in progress but do not block required exit ways.

END OF SECTION

SECTION 01 36 00
CUTTING AND PATCHING

PART 1 – GENERAL

1.1 SUMMARY

A. This Section establishes general requirements pertaining to cutting (including excavating), fitting, and patching of the Work required to:

1. Make the several parts fit properly;

2. Uncover work to provide for installing, inspecting, or both, of ill-timed work;

3. Remove and replace work not conforming to requirements of the Contract Documents; and

4. Remove and replace defective work.

B. Related work:

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

2. In addition to other requirements specified, upon the District's request uncover work to provide for inspection by the District of covered work, and remove samples of installed materials for testing.

3. Do not cut or alter work performed under separate contracts without the District's written permission.

1.2 SUBMITTALS

A. Request for District's consent:

1. Prior to cutting which affects structural safety, submit written request to the Project Manager for permission to proceed with cutting.

2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Project Manager and secure his written permission and the required Change Order prior to proceeding.

B. Notices to the Project Manager:

1. Prior to cutting and patching performed pursuant to the District's instructions, submit cost estimate to the Project Manager. Secure the Project Manager's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.

2. Submit written notice to the Project Manager designating the time the Work will be uncovered, to provide for the District's observation.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

PART 2 – PRODUCTS

2.1 MATERIALS

A. For replacement of items removed, use materials complying with pertinent Sections of these Specifications.

2.2 PAYMENT FOR COSTS

A. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is submitted by the Contractor. Perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection:

1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching, and backfilling.

2. After uncovering the work, inspect conditions affecting installation of new work.

B. Discrepancies:

1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.

2. Do not proceed until unsatisfactory conditions are corrected.

3.2 PREPARATION PRIOR TO CUTTING

A. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.3 PERFORMANCE

A. Perform required excavating and backfilling as required under pertinent other Sections of these Specifications and OSHA standards for such work.

1. Perform cutting and demolition by methods which will prevent damage to other portions of the Work and provide proper surfaces to receive installation of repair and new work.

2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

3. Typically chip back existing adjoining plaster surfaces to expose the lath and building paper to permit proper lapping on new infill materials.

END OF SECTION

SECTION 01 40 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

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

2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections:

1. Divisions 2 through 33 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

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

E. Product Testing: Tests and inspections that are performed by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

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

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

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

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

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

1.3 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems.

1. Seismic-force resisting system, designated seismic system, or component listed in the designated seismic system quality assurance plan prepared by the Architect.

2. Main wind-force resisting system or a wind-resisting component listed in the wind-force-resisting system quality assurance plan prepared by the Architect.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.

2. Project title and number.

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

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

5. Names of individuals making tests and inspections.

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

7. Identification of product and Specification Section.

8. Complete test or inspection data.

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

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

11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.

12. Name and signature of laboratory inspector.

13. Recommendations on retesting and re-inspecting.

B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of representative making report.

2. Statement on condition of substrates and their acceptability for installation of product.

3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.

4. Results of operational and other tests and a statement of whether observed performance complies with requirements.

5. Other required items indicated in individual Specification Sections.

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

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

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

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

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

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

1. Contractor responsibilities include the following:

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

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

c. When testing is complete, remove test specimens, assemblies, mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.

2. Notify Architect seven days in advance of dates and times when mockups will be constructed.

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

4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

a. Allow seven days for initial review and each re-review of each mockup.

5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

6. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

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

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

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

a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.

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

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

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

C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.

D. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

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

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

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

5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.

6. Do not perform any duties of Contractor.

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

1. Access to the Work.

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

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

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

5. Delivery of samples to testing agencies.

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

7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

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

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency and/or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:

B. Special Tests and Inspections: Conducted by a qualified testing agency or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.

2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.

3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.

4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.

5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.

6. Retesting and re-inspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

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

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 1.

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

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

END OF SECTION

SECTION 01 45 29
TESTING AND INSPECTION REQUIREMENTS

1.01 SUMMARY

A. Section Includes: Cooperate with the Owner's selected testing agency, the Project Inspector, and others responsible for testing and inspecting the Work, and assist the Owner by coordinating such testing and inspecting services as specified in this Section and/or elsewhere in the Contract Documents including the attached Division of State Architect Structural Tests and Inspections sheet (enclosed).

B. Related Work Specified Elsewhere:

1. Requirements for testing may be required in other Sections of these Specifications.

2. Where no testing requirements are specified or required by reference standards or authorities having jurisdiction, the Owner may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described herein.

C. Work Not Included:

1. The Owner will select a pre-qualified independent testing laboratory and Inspector as approved by the Division of the State Architect, Office of Regulation Services.

2. The Owner will pay for initial services of the testing laboratory as further described hereinafter.

1.02 QUALITY ASSURANCE

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

B. Qualifications of Testing Laboratory: A DSA accepted testing laboratory directly employed by the district (owner) shall conduct all the required tests and inspections for the project.

C. Codes and Standards: Testing, when required, will be in accordance with pertinent codes and regulations and with selected standards of the American Society for Testing and Materials and other organizations or agencies which publish recognized codes, standards, or tests. Refer to Article 3.04 – Required Testing of this Section.

D. The project specifications shall be in accordance with the provisions of the Standard Specifications for Public Works Construction (SSPWC) 2012 Edition.

1.03 TEST REPORT DISTRIBUTION

A. Promptly process and distribute required copies of test reports and related instructions to ensure necessary retesting and/or replacement of materials with the least possible delay in progress of the Work.

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

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

1.04 PAYMENT FOR TESTING SERVICES

A. Initial Services: The Owner will pay for initial testing and inspection except as specifically modified herein-after or as specified otherwise in technical sections. Provided the results of inspection indicating compliance with the Contract Documents.

B. Retesting: When initial tests or inspection indicate noncompliance with the Contract Documents, subsequent retesting or re-inspection occasioned by the noncompliance shall be performed by the same testing laboratory or Inspector and the costs thereof will be deducted by the Owner from the Contract Sum. Retesting and re-inspection will continue until test or inspection results indicate compliance.

C. Code Compliance Testing: Inspections and tests required by codes or ordinances, or by authorities having jurisdiction and made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Owner, but back charged to the Contractor in case of retesting due to noncompliance.

D. Specified Inspections and Tests: Tests and inspections specified in the Specifications, directly or by reference, shall be coordinated by the Contractor at his expense and paid for by the Owner. Corrections of noncompliance and test failures shall be paid for by the Owner, but shall be back charged to the Contractor. Re-inspection and retesting shall be in accordance with paragraph 1.04-B.

E. Contractor’s Convenience Testing: Inspecting or testing performed exclusively for the Contractor’s convenience shall be the sole responsibility of and at the expense of the Contractor.

1.05 INSPECTION BY THE OWNER

A. The Owner and his representatives will have access, for the purpose of inspection, to parts of the work and to the shops wherein the work is in preparation, and the Contractor shall maintain proper facilities and provide safe access for such inspection.

B. The Owner shall have the right to reject materials and workmanship which are defective, and to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without charge to the Owner. If the Contractor does not correct such rejected within a reasonable time, fixed by written notice, the Owner may correct rejected work and charge the expense to the Contractor.

C. Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out the same, the Contractor shall on request promptly furnish necessary facilities, labor and materials. If such work is found to be defective in respect due to fault of the Contractor or his subcontractor, he shall defray expenses of such examinations and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the additional cost of labor and material necessarily involved in the examination and replacement will be allowed the Contractor.

1.06 PROJECT INSPECTOR

A. A “DSA Certified” Project Inspector employed by the District (owner) and approved by the DSA shall provide continuous inspection of the work. The duties of the inspector are defined in section 4-342, Part 1, Title 24, CCR.

42. Duties of the Project Inspector.

(A) General: The Project Inspector shall act under the direction of the A/E/Engineer.

(B) Duties: The general duties of the Project Inspector in fulfilling his or her responsibilities are as follows:

(1) Inspection: He or she must have actual personal knowledge, obtained by his personal inspection of the work of construction in stages of its progress, that the requirements of the approved plans and specifications are being completely executed.

Inspection means complete inspection of every part of the work. Work, such as concrete work or brick work which can be inspected only as it is placed, shall require the constant presence of the Project Inspector. Other types of work which can be completely inspected after the work is installed may be carried on while the Inspector is not present. In any case, the Project Inspector must personally inspect every part of

the work. In no case shall the Project Inspector have or assume duties which will prevent him or her from providing inspection.

The Project Inspector may obtain personal knowledge of the work of construction, either on-site or off-site, performed under the inspection of a Special Inspector or Assistant Inspector from the reporting of others on testing or inspection of materials and workmanship for compliance with the plans, specifications and applicable standards. The exercise of reasonable diligence to obtain the facts shall be required.

(2) Relations with A/E/Engineer: The Project Inspector shall work under the general direction of the A/E/Engineer. Inconsistencies or seeming errors in the A/E/Engineer for his interpretation and instructions. In no case, however, shall the instruction of the A/E/Engineer be construed to cause work to be done which is not in conformity with the approved plans, specifications, and change orders.

(3) Job File: The Project Inspector shall keep a file of approved plans and specifications (including approved addenda or change orders) on the job, and shall immediately return unapproved documents to the A/E for proper action. The Project Inspector, as a condition of his employment, shall have and maintain on the job, codes and documents referred to in the plans and specifications.

(4) Project Inspector's Semi-Monthly Reports: The Project Inspector shall keep the A/E/Engineer thoroughly informed as to the progress of the work by making semi-monthly reports in writing as required in Section 37.

(5) Not Used.

(6) Construction Procedure Records: The Project Inspector shall keep a record of certain phases of construction procedure.

All such records of construction procedure shall be kept on the job until the completion of the work. These records shall be made a part of the permanent school records.

(7) Deviations: The Project Inspector shall notify the Contractor, in writing, of deviations from the approved plans and specifications which are not immediately corrected by the Contractor when brought to his or her attention. Copies of such notice shall be forwarded immediately to the A/E/Engineer.

Failure on the part of the Project Inspector to notify the

Contractor of deviations from the approved plans and specifications shall in no way relieve the Contractor of responsibility to complete the work covered by his or her contract in accordance with the approved plans and specifications and laws and regulations.

(8) Verified Reports: The Project and Special Inspectors shall each make and submit to the Division of the State Architect verified reports.

The Project Inspector shall prepare and deliver to the Division of the State Architect detailed statements of fact regarding materials, operations, etc., when requested.

(c) Violations: Failure, refusal, or neglect on the part of the Inspector to notify the Contractor of work which does not comply with the requirements of the approved plans and specifications, or failure, refusal, or neglect to report immediately, in writing, such violation to the A/E/Engineer, to the School Board, and to the Division of the State Architect shall constitute a violation of the act and shall be cause for the Division of the State Architect to take action.

Note: Authority cited: Section 39152 and 81142, Education Code. Reference: Sections 39151, 39153, 81141 and 81143, Education Code."

B. The work of construction in stages of progress shall be subject to the personal continuous observation of the Project Inspector as continuous observation is defined by Title 24. He shall have free access to all parts of the work at any time. The Contractor shall furnish the Project Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed respecting the progress and manner of the work and the character of the materials. Inspection of the work shall not relieve the Contractor from obligation to fulfill this Contract.

1.07 OWNER'S OTHER PERSONNEL

A. From time to time, other personnel in the employ of the Owner may inspect the Work when the Work is in progress but shall have no authority to direct the Contractor or request changes in the Work except as may be provided elsewhere in the Contract Documents.

1.08 REPRESENTATIVE OF THE DIVISION OF THE STATE ARCHITECT

A. Architect shall have access to the site in accordance with Title 24, Part 1, 4-333.

B. Field Engineers and Inspectors from D.S.A. Structural Safety Section, Fire & Life Safety Review and Access Compliance shall have access to the site in accordance with Title 24, Part 1, 4-334.

PART 2 - PRODUCTS

(Not Applicable)

PART 3 - EXECUTION

3.01 COOPERATION WITH TESTING LABORATORY AND INSPECTORS

A. Inspectors and representatives of the testing laboratory shall have access to the work. Provide facilities for such access in order that the testing, inspection, and the obtaining of samples may be done properly.

B. Contractor shall deliver material specimens to the Owner's testing lab, which must by terms of the Contract be tested prior to inclusion in the Project, at least 45 days prior to scheduled delivery to the job site.

C. Material shipped by the Contractor from the source of supply prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said representative that such testing and inspection will not be required shall not be incorporated in the job.

3.02 TAKING SPECIMENS

A. Field specimens and samples for testing, unless otherwise provided in these Contract Documents, shall be selected and taken by the Testing Laboratory or Project Inspector and not the Contractor. Sampling equipment and personnel will be provided by the testing laboratory. Deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory. Soil samples for approval of import fill shall be picked-up by the Testing Laboratory.

3.03 SCHEDULES FOR TESTING

A. Establishing Schedule:

1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.

2. Provide required time within the construction schedule.

B. Revising Schedule: When changes of construction schedule are necessary during construction, coordinate such changes of schedule with the testing laboratory as required.

C. Adherence to Schedule: When the testing laboratory is ready to test according to the determined schedules, but is prevented from testing or taking specimens due to incompleteness of the work, extra charges for testing attributable to the delay may be back-charged to the Contractor and will be deducted by the Owner from the Contract Sum.

3.04 REQUIRED TESTING

Tests and inspections for the following items, where applicable, will be required in accordance with referenced Sections/Chapters of California Building Code, 2019 Edition, Title 24, Part 2:

A. FOUNDATIONS:

1. INSPECTION:

a. Inspection of Cast-In-Place Deep Foundation 1705A.8

B. CONCRETE (Chapter 19A)

1. MATERIALS:

a.	Portland Cement	1704A; 1910A.1
b.	Concrete Aggregates	1704A; 1908A.3
c.	Not Used	
d.	Reinforcing Bars	1704A; 1910A.2

2. QUALITY:

a.	Proportions of Concrete	1901A
b.	Strength Tests of Concrete	1905A.1.15
c.	Shotcrete Proportions	1908A.2
d.	Shotcrete Cores	1908A.10
e.	Composite Construction Cores	1910A.4
f.	Gypsum Concrete Strength Tests	2514A

3. INSPECTION:

a.	Job Site	1704A
b.	Batch Plant	1705.A..3.3
c.	Waiver of Batch Plant	1705.A..3.3.1

	d.	Pre-stressed Concrete	1705A..3.4
	e.	Shotcrete	1705A.19; 1908A
	f.	Reinforcing Bar Welding	1903A.8; Table 1705A.3
	g.	Post-Installed Anchors in Concrete	1705A..3.8; 1910A.5; 1909.2.7

C. LIGHT WEIGHT METALS

1. MATERIALS

a.	Alloys	2002.1
b.	Identification	2002.1

2. INSPECTION

a.	Welding	2003.1

D. STRUCTURAL STEEL

1. MATERIALS

a.	Structural Steel	2205A.1
b.	Cold Form Steel	2210A.1
c.	Identification	2202A.1

2. QUALITY

a.	Tests of Structural and Cold Form Steel	2210A
b.	Tests of End Welded Studs	1705A.2.5; 2213A.2; 2212.6.2
c.	Steel Joists	2207A; 1704A; 1705A

		d. Non-Destructive Weld Tests	AISC 360: N5.5

3. INSPECTION

a.	Shop Fabrication	1704A.2.5
b.	Welding	1704A
c.	Nelson Stud Welding	1704A

E. WOOD

1. MATERIALS:

a.	Lumber and plywood	2303.1

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES

PART 1 – GENERAL

1.01 SUMMARY

A. Provide all temporary facilities and controls required for the performance of the Work.

B. Supervise the use of all temporary facilities and controls. Enforce compliance with applicable standards. Prevent abuses of services.

1.02 SAFETY

A. Guard machinery, equipment, and all hazards in accordance with the safety provisions of the latest edition of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law.

1. Protect all hazards with adequately constructed guard rails or barricades and provide lanterns, warning lights, and the like, as necessary. Eliminate all attractive nuisance from the work and the room site.

2. To this end, dispose, store, guard, and protect the premises and all work materials, equipment and both permanent and temporary construction so as to preclude the unauthorized use thereof by children or others and particularly to eliminate possible consequent injury to all persons.

B. Structural design of all items used in the construction of the building and not a permanent part thereof, including, shoring for concrete and masonry work, the temporary bracing for structural steel, and the shoring of cut earth banks, its the sole responsibility of the Contractor.

1.03 SCAFFOLDING AND HOISTS

A. Furnish and maintain hoists, staging, rigging, scaffolding, and runways required in the prosecution of the work. Erect, equip and maintain such temporary work in accordance with statutes, laws, ordinances, rules or regulations of the State of California and other authorities and Insurance Companies having jurisdiction.

1.04 DUST CONTROL

A. During the life of the Contract, provide effective means of dust control both within the structure and on the surrounding site.

B. Obtain the Architect's approval before use of any means except water.

C. Water all active construction areas as often as needed to control dust.

D. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least 2 feet of freeboard.

E. Apply water 3 times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking areas and staging areas at construction site.

F. Sweep daily with water sweeper, all paved access roads, parking areas and staging areas at construction site.

G. Sweep streets daily with water sweeper, if visible soil material is carried onto adjacent public streets.

H. Hydroseed or apply non-toxic stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).

I. Enclose, cover water twice daily or apply non-toxic soil binders to exposed stockpiles of dirt, sand and other loose materials.

J. Limit traffic speed on unpaved roads to 15 mph.

K. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

L. Replant vegetation in disturbed areas as quickly as possible.

1.05 MAINTENANCE OF TRAFFIC

A. Maintain traffic on all streets adjacent to or leading to the site.

B. Where construction operations interfere with the free movement of traffic, provide traffic controls, flagmen or similar devices to efficiently control traffic movement.

C. Provide a traffic control permit from the local authorities if required.

D. Schedule delivery of materials and construction activities so that they do not interfere with student/public traffic at drop-off and pick-up.

1.06 DEWATERING

A. Furnish and maintain all pumps or other dewatering devices required by this Work.

1.07 PROJECT OFFICE

A. Provide and maintain, for the duration of the Contract, a project office, complete with heat, light, ventilation and convenience outlets. The office shall be of sufficient size for the Contractor's personnel and operators and shall provide desk space for use by the Architect and for inspection personnel.

1.08 TELEPHONE

A. Provide and pay for all necessary temporary telephone service.

B. Maintain telephone(s) in continuous service on the project site during the course of the Work and make available at all times, free and unrestricted, to the Architect's and District's representatives for calls in direct connection with the Work.

1.09 TEMPORARY TOILETS

A. Provide temporary toilet facilities for all personnel employed on the Project. Maintain toilets in a clean and sanitary condition at all times. Remove at Project completion.

1.10 CONSTRUCTION WATER AND POWER

A. Make arrangements for all water and power required for the Project. Provide all temporary lines and arrange for billing to go directly to District. Remove temporary facilities at Project completion.

1.11 FENCES AND BARRICADES/SECURITY

A. Around the construction site, erect fences and barricades with gates, as required by local governing authorities, for security and to prevent unauthorized entry to the Work site. Maintain in good condition until completion of the Project.

1.12 SIGNS

A. Furnish and erect a ¾ in. x 48 in. x 96 in. job sign painted and lettered to identify the Project, the Architect and the Contractor. Mount on post and brace as indicated by the Architect. Sign shall be lettered by a professional sign painter, and the layout shall be as indicated by the Architect.

B. Keep the premises free from all other posters, signs, and miscellaneous decorations, except those required by Code and to indicate unsafe conditions.

1.13 COPIES OF STANDARDS AND CODES

A. Copies of applicable referenced standards are not bound in this Project manual.

B. Copies of standards and California Building Code, Title 24, Parts I and II and shall be kept and available at the Project Site, available to the Contractor’s personnel, Sub-contractors, District, Inspectors and Architect.

END OF SECTION

SECTION 01 66 00
PRODUCT HANDLING

1.00 GENERAL

1.01 SUMMARY

A. Section includes:

1. This Section establishes general requirements for product handling and storage, whether on or off site, and supplements similar provisions found elsewhere in the Contract Documents.

1.02 HANDLING

A. General: Transport, deliver, handle, and store all materials and equipment used on the Project to prevent the intrusions of foreign matter, moisture, and to prevent damage. In all cases comply with the following.

1. Material and equipment manufacturer's printed instructions regarding temperature limitations.

2. Other environmental conditions which are required to maintain original quality of materials and equipment.

B. Packaging:

1. Provide packaged materials in their manufacturer's original containers with seals unbroken and labels intact until incorporating into the Work.

2. Wrapped or bundled materials shall clearly bear the manufacturer's name and trade mark.

C. Damaged materials: Remove damaged or otherwise unsuitable material and equipment promptly from the site. Do not install damaged materials.

1.03 STORAGE

A. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.

B. Store products at the site to facilitate inspection and measurement of quantity or counting of units.

C. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

1. Do not subject slabs-on-grade to excessive loading by shoring, storage of materials or operation of construction equipment unless adequately protected by heavy planking. Maintenance of slabs in good condition is the responsibility of the

Contractor who shall remove damaged areas of such slabs and replace them with new work, to the Architect's satisfaction, at no cost to the Owner.

D. Store products subject to damage by elements above ground, under cover in weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

E. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

F. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.

G. Locate storage piles, stacks or bins to avoid being disturbed, and protect from damage of any sort.

H. Store materials and equipment in accord with their manufacturer's instructions, above grade, and properly protected from weather and construction activities.

I. Payment may be withheld for improperly packaged and stored materials.

1.04 PROTECTION

A. Protect all finished surfaces, including floors, jambs, and soffits of all openings used as passageways or through which materials and equipment must travel.

B. Carts, hand trucks, wheelbarrows and similar wheeled conveyances used on or in any portion of the buildings shall be equipped with pneumatic tires, unless otherwise authorized by the Architect.

C. Keep finished surfaces clean and unmarred until the date of acceptance.

D. Refer to individual Specification Sections for additional specific product handling and protection requirements.

2.00 PRODUCTS

Not used.

3.00 EXECUTION

Not used.

END OF SECTION

SECTION 01 74 00
CLEANING

1.00 GENERAL

1.01 DESCRIPTION

A. Principal work in this Section:

1. Keep premises, and adjacent private and public properties free from accumulations of waste, debris and rubbish caused by construction operations.

2. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all exposed surfaces. Remove remaining mock-ups and sample panels.

3. Leave Project clean and ready for occupancy.

1.02 SAFETY REQUIREMENTS

A. Standards: Maintain Project in accord with State and local safety and insurance standards.

B. Hazard control:

1. Store volatile wastes in covered metal containers, and remove from premises daily.

2. Prevent accumulation of wastes which create hazardous conditions.

3. Provide adequate ventilation during use of volatile or noxious substances.

C. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on Project site.

2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains. Store in containers with tight-fitting lids and remove to legal dump site or to recycling center.

2.00 PRODUCTS

Not used.

3.00 EXECUTION

3.01 DURING CONSTRUCTION

A. Keep premises, and adjacent private and public properties free from accumulations of waste materials and rubbish. Remove debris and dirt from public property promptly; sweep sidewalks and adjacent streets daily when soiled by work performed under this Contract.

B. Wet down materials and rubbish to lay dust and prevent it from blowing.

C. At least once a week, or more often if required, clean site and dispose of waste materials, debris and rubbish off the site in a legal manner. Remove combustible materials such as paper and cardboard daily.

D. Provide on-site containers for collection of waste materials, debris and rubbish. Provide a collection can at each location used as an eating area. Pick-up all garbage daily.

E. Remove waste materials, debris and rubbish from site and legally dispose of at legal public or private dumping areas or recycling center off District's property.

F. Do not allow debris and combustible materials to accumulate in, voids, cavities, and plenums created by wall, partition, and ceiling construction. These areas must be thoroughly cleaned out before being sealed or closed off by installation of finish materials.

G. Do not allow debris to clog drains. Clean roof drains, scuppers, floor drains and area drains free of debris. Verify that they drain properly. Keep drains clean of debris at all times.

H. Vacuum clean interior areas when ready to be painted. Refer to Section 09900 for other provisions on preparation of surfaces to be painted.

I. Handle materials in a controlled manner with as few handling as possible; do not drop or throw materials from heights.

J. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

3.02 FINAL CLEANING

A. Employ experienced workers, or professional cleaners, for final cleaning.

B. In preparation for Substantial Completion or Occupancy conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.

C. Remove labels that are not permanent labels.

D. Clean transparent materials, including mirrors and glass in doors and windows. Remove misplaced glazing compound and other substances. Replace chipped or broken glass

and other damaged transparent materials.

E. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

F. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

G. Clean the site, including landscaped areas, of rubbish, litter and other foreign substances.

1. Contaminated earth:

a. Final clean-up operation includes the removal and disposal of earth contaminated or unsuitable for support of plant life in planting areas, and filling of resulting excavations with suitable soil.

b. Contaminated areas include those used for disposal of waste concrete, mortar, plaster, masonry, and similar materials, areas in which washing out of concrete and plaster mixers or washing of tools and like cleaning operations have been performed, and areas that have been oiled, paved, or chemically-treated.

c. Do not dispose of waste oil, solvents, paints, solutions, or like penetrating material by depositing or burying on District's property.

2. Sweep paved areas broom clean; remove stains, spills and other foreign deposits.

3. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

H. Keep Project clean until it is occupied by District.

END OF SECTION

SECTION 01 77 20
PROJECT RECORD DOCUMENTS

1.00 GENERAL

1.01 SUMMARY

A. Section includes: General requirements for preparation, maintenance and delivery of record documents.

1.02 SUBMITTALS

A. Deliver record documents and transparencies to Architect at completion of Project.

B. Accompany submittal with transmittal letter, in duplicate, containing date, Project title and number, Contractor's name and address, title and number of each record document, certification that each document as submitted is complete and accurate, and signature of Contractor or its authorized representative.

2.00 PRODUCTS

Not Used.

3.00 EXECUTION

3.01 DOCUMENT MAINTENANCE

A. Maintain one copy of the following in Contractor's field office at the site:

1. Contract Drawings, including the DSA stamped set.

2. Specifications and Addenda.

3. Reviewed shop drawings.

4. Bulletins and change orders, field change authorization and notice of clarification, and other modifications to Contract.

5. Field test records.

B. File record documents apart from constructions documents and maintain in clean, dry, legible condition. Make record documents available for review by the Owner and Architect during regular business hours.

C. Do not use record documents for construction purpose.

D. Record documents will be subject to a monthly review by the Architect prior to approval

of each progress payment.

3.02 RECORDING

A. Clearly label each document "PROJECT RECORD".

B. Keep record documents current.

C. Record and properly dimension deviations on the record drawings within 24 hours after work in affected area is completed. Dimensions shall be accurate to within 1 in.

1. Use a fine felt or nylon tip pen with waterproof colored ink for marking.

2. Legibly mark to record actual construction of the following:

a. Depths of various elements of foundation in relation to first floor level.

b. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements. Cut-off points and point of connections of utilities.

c. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.

d. Field changes of dimension and detail.

e. Changes made by Change Order, Field Change Authorization and Notice of Clarification.

f. Details not on original Contract Drawings.

g. Do not permanently conceal any work until required information has been recorded.

D. Legibly mark-up each Section of the Specifications to record the following.

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment installed.

2. Changes made by change order, field change authorization and notice of clarification.

3. Other matters not originally specified.

E. Maintain shop drawings as record documents. Legibly annotate to record changes made after approval.

END OF SECTION

SECTION 01 78 23
OPERATING AND MAINTENANCE DATA

1.00 GENERAL

1.01 SUMMARY

A. Prepare all maintenance manuals and operating instructions required by the Specifications.

B. Bind manuals and instructions in durable plastic binders as follows:

1. Identify the front cover and binding edge of the manual with the name of the Project and
"OPERATING AND MAINTENANCE DATA."

2. Provide typewritten table of contents near the front of manual with page numbers to quickly locate the information.

3. Provide complete instructions regarding operation and maintenance of all equipment involved, including but not limited to, start-up and shut-down procedures, and safety precautions.

4. Provide complete nomenclature of all replaceable parts, their part numbers, current cost, and name and address of nearest vendor of parts.

5. Provide copy of guarantees and warranties issued by the equipment manufacturers.

6. Provide copy of the approved shop drawings, as applicable to the content of the manual, with all data concerning changes made during construction.

7. Use 8-1/2 in. by 11 in. sheets, except that larger sheets may be used when folded to this size and used as a pull-out.

C. Where content of manuals include manufacturers' catalog pages, clearly indicate the precise items included in this installation and delete, or otherwise clearly indicate all manufacturers' data with which this installation is not concerned.

D. Unless otherwise specified, provide one copy of each manual.

END OF SECTION

SECTION 02 11 10
PRE-CONSTRUCTION SURVEY

1.00 GENERAL

1.01 SUMMARY

A. Prior to commencing operations on the site, the Contractor shall provide a topographic survey which also indicates the project boundary. The contractor shall compare the survey with the design plans and notify the Architect of any areas where the existing conditions vary from those indicated on the design plans. Copies of this survey shall be delivered to the Architect as described below.

1.02 SURVEY

A. The Contractor shall hire a California licensed land surveyor to prepare an as-built survey of the site conditions as they exist prior to construction.

B. The survey shall be prepared at a scale of 1”=30’ or 1”=20’ on 30 inch by 42 inch sheets and shall be provided in AutoCAD Release 2002 or later version along with two plots of same.

C. The survey shall indicate the basis of bearings and bench mark, and the surveyor shall set two on-site temporary bench marks at the same datum. The datum shall match the datum used by the Developer who graded the site.

D. The survey shall indicate top and toe of all slopes, grade breaks, flow lines, swales, ridges, etc. It shall also indicate elevations along the property lines, back of walk, street curb, driveways, etc.

E. The survey shall indicate street utility services and evidence of any utilities passing through the site.

F. Elevations shall be indicated a 50-foot grid maximum spacing across the entire site and one foot contours shall be indicated.

G. Any overhead lines shall be indicated.

H. Changes in material type shall be indicated with elevations.

1.03 SUBMITTALS

A. Contractor shall deliver two copies of the electronic AutoCAD drawing on CDs, and two plotted copies of same. The plotted survey shall be dated, signed and sealed by the licensed land surveyor.

B. The Architect will review the survey prior to approval to verify that the above requirements have been met.

END OF SECTION

SECTION 02 31 00
TRENCHING AND BACKFILLING FOR UTILITIES

1.00 GENERAL

1.01 SUMMARY

A. Section includes:

1. Trenching, backfilling and compacting for utilities.

2. Bedding material for pipes.

B. Related work:

1. All other trenching, shoring and bracing, backfilling, and compacting: Section 02 31 00.

2. Installation and tests of utilities: Division 33.

1.02 QUALITY ASSURANCE

A. Obtain District's Geotechnical Engineer's approval of backfill materials, method of placement, and of the completed work of this Section.

B. Reference data: Maps, soil investigation reports, and similar reference data are made available to Contractor for information only. District and Architect assume no responsibility for conclusions the Contractor may draw there from.

C. Reference standard:

2. Perform all work in compliance with applicable provisions of "Standard Specifications for Public Works Construction" (SSPWC). Mention herein of section numbers refers to sections of the reference standard.

3. Where reference standard refers to "Agency," substitute the word "District." Where reference standard is in conflict with these Specifications, these Specifications govern.

1.03 SOIL INVESTIGATION REPORT

A. Refer to the General Conditions.

1.04 WARRANTY

A. Any settling of backfill in trenches which may occur during the one-year period after Substantial Completion shall be repaired to District's satisfaction by Contractor without expense to District, including complete restoration of damaged paving, walks, and other materials or installations of every kind.

2.00 PRODUCTS

2.01 IMPORTED MATERIAL

Not used.

2.02 ON-SITE MATERIALS

A. Materials from cuts or excavations, approved by the Geotechnical Engineer, free of debris and without soft, spongy, organic and other deleterious materials.

1. Do not use cobbles or boulders larger than 4 in. in largest dimensions at any depth.

2. Do not use rocks greater than 2-1/2 in. in largest dimension in backfill within 12 in. of the top of pipe or structure, and within 12 in. of the top of pavement subgrade.

3. Where rocks are included in backfill, mix with suitable materials to eliminate voids.

2.03 BEDDING MATERIALS

A. Complying with section 306.1.2.1, Bedding, of the reference standard.

3.00 EXECUTION

3.01 INSPECTION

A. Verify conditions and measurements affecting the work of this Section at site. Make sure that detrimental conditions are corrected before proceeding with installation.

3.02 PROTECTIVE MEASURES

A. Utilities: Protect existing utility lines.

B. Settlement:

1. In areas where compacted backfill has been placed, additional consolidation will occur after completion due to changes in moisture content and surcharge.

2. Install utility connections crossing this backfill to the building, and improvements adjoining the building at the backfill line, to take into account this additional consolidation, or schedule sufficient time between backfilling operations and such improvements to allow this consolidation to take place.

3.03 COMPACTION CONTROL

A. Notification: Notify the Geotechnical Engineer whenever trench backfill work is being performed as part of this Section.

B. Replacement: Geotechnical Engineer will determine if work performed without inspection meets the requirements of these Specifications. Where directed by Geotechnical Engineer, uncover and replace work performed without inspection at no additional cost to the District.

3.04 TRENCH EXCAVATION

A. Before opening any new excavations, uncover all intersecting existing utility lines located between the ground surface and one foot below the bottom of the new trench line.

1. General:

a. Where unidentified existing utilities are encountered, determine whether these are active or abandoned.

b. Remove interfering portions of abandoned utilities and cap or plug open ends of pipe to remain.

c. The cap or plug must seal the opening in such a manner that would permit remaining portion of the utility to be reactivated.

d. Notify Architect for instructions on utilities which are determined to be active. Any relocation work performed on an active utility without obtaining prior approval of Architect will be done at the Contractor's risk and expense.

e. Do not proceed without instructions, except to correct an immediate hazard or emergency condition.

2. Trench width:

a. Maximum width of trench shall be 20 in. more than greatest diameter of pipe up to a point 6 in. above top of the pipe, except that it may be widened enough to place sheeting.

b. Make trenches at least 12 in. wider than greatest exterior diameter of pipe or conduit except that trenches for concrete-encased ducts may be the same width as duct encasement.

3. Dimensional tolerance:

a. Maintain accuracy of gravity utility lines designated for gradients less than 1% to 1/8 in. at any point and cumulative within 1/2 in./100 ft.

b. For all gravity lines, check each section of pipe for proper gravity slope direction with a string line set over the pipe by a surveyor.

c. Non-gravity utility line subgrades shall be accurate within +2 in.

3.05 PIPE BEDDING

A. Where bedding is required, provide a minimum of 4 in. of bedding material in the bottom of the trench, in addition to the requirements of section 306-1.2.1 of the reference standard, before installing pipes or conduits.

B. Do not allow water to accumulate in the trench.

3.06 DEWATERING

A. At no time shall water be allowed to back up into pipe in place. Securely plug terminal ends of pipe before work is abandoned at end of day or when laying is interrupted.

3.07 TRENCH BACKFILL

A. Backfilling of utility trenches shall not be undertaken (1) for 24 hours after Geotechnical Engineer has been notified of same, (2) until required tests and inspections have been completed, and (3) until "as-built" location notes have been recorded.

B. Place backfill material in compliance with section 306-1.3.2 of the reference standard, and to achieve at least 90% of the maximum density in compliance with ASTM D 1557. The top 12 in. of backfill in the building and under paved areas shall be compacted to 95% of maximum density.

C. Compaction by jetting, ponding or flooding is not permitted.

D. Remove surplus earth left after backfilling, and grade top of trench to match adjacent grades.

E. Backfill voids left by removal of sheeting, piles, and similar sheeting supports immediately with clean sand to assure dense and complete filling of voids.

END OF SECTION

SECTION 02 41 19
SITE DEMOLITION AND CLEARING

1.00 STANDARDS

1.01 SUMMARY

A. Section includes:

1. Demolition and removal from Owner’s property concrete and asphalt pavement and curbs.

2. Demolition and removal from Owner’s property landscaping, trees designated to be removed and irrigation piping and related items.

3. Demolition and removal from Owner’s property underground utilities where shown on drawings and as required to complete project.

4. Abandon facilities and utilities.

5. Backfilling voids created by removing demolished items.

6. Contacting contaminated soils.

7. Disposal of demolished/removed items.

8. Dust control.

9. Erosion control.

10. Tree protection.

1.02 REQUIREMENTS

A. Geotechnical Engineering Report has been prepared by Earth Systems for the Rosamond High School Cafeteria Building project. Copies of this report and any addenda are available for review at the office of the Owner's Representative.

B. Construction materials and methods shall be in accordance with the site-specific recommendations and standard specifications contained in the Geotechnical Engineering Report.

C. A Geotechnical Engineer employed by the Owner to perform observation, testing and reporting during construction in accordance with the contract documents (hereinafter referred to as the Construction-Phase Geotechnical Engineer).

D. Observation

1. Refer to Section 01 45 29, Testing Laboratory and Inspection Services, for additional requirements.

2. Clearing and grubbing operations shall be observed by the Construction Phase Geotechnical Engineer.

3. Demolition operations requiring excavation more than 12 inches below existing ground surface shall be continuously observed by the Construction-Phase Geotechnical Engineer.

4. All plugging of pipelines or conduits allowed to be abandoned in place outside of building and pavement areas shall be observed by the Construction-Phase Geotechnical Engineer.

5. Contractor shall notify the Construction-Phase Geotechnical Engineer and the Owner's Representative at least five (5) working days prior to commencement of clearing operations.

6. The cost of observation by the Construction-Phase Geotechnical Engineer shall be borne by the Owner.

7. The Construction-Phase Geotechnical Engineer shall certify that site demolition was properly completed in conformance with the Drawings and Specifications. Certification shall be in the form of a report to the Owner's Representative.

2.00 MATERIALS (Not Used)

3.00 EXECUTION

3.01 LOCATING AND MARKING FACILITIES

A. Before beginning clearing or other excavation, determine the location of all existing buried conduits and structures which are to remain within the work area and mark these locations at the site with paint and/or flags.

3.02 CLEARING AND GRUBBING

A. Prior to commencing grading operations, clear the existing ground surface of areas to be graded of all organic material vegetation (except trees indicated on the Drawings to remain), whether living or dead, including large roots, as well as all trash and debris, as determined by the Construction Phase Geotechnical Engineer.

B. Prior to commencing grading operations, excavate and remove from areas to be graded all existing non-complying fill and soil containing debris, organics, pavement and other unsuitable material as determined by the Construction Phase Geotechnical Engineer.

3.03 DEMOLITION

A. Where demolition areas are indicated on the Drawings and/or called for in the Specifications, clear old pavements, old foundations, slabs, curbs, gutters, abandoned pipelines and conduits, and soils contaminated during demolition operations as determined by the Construction Phase Geotechnical Engineer, EXCEPT WHERE SUCH CLEARING OPERATIONS MAY JEOPARDIZE EXISTING TREES OR STRUCTURES TO REMAIN ("jeopardize" with respect to a tree shall mean excavation within the drip line and "jeopardize" with respect to a structure shall mean excavation below a line projected downward at a 2 horizontal to 1 vertical slope from a point 1 foot above the bottom of the foundation); in such case, request direction form the Owner's Representative before proceeding with the work.

1. In addition to demolition, which may be indicated on the Drawings, make a thorough search for abandoned facilities such as septic systems, wells, fuel or water storage tanks, and pipelines or conduits. Remove any such abandoned facilities encountered, EXCEPT WHERE SUCH REMOVAL OPERATIONS MAY JEOPARDIZE EXISTING TREES OR STRUCTURES TO REMAIN ("jeopardize" with respect to a tree shall mean excavation within the drip line and "jeopardize" with respect to a structure shall mean excavation below a line projected downward at a 2 horizontal to 1 vertical slope from a point 1 foot above the bottom of the foundation); in such case, request direction from the Owner's Representative before proceeding with the work.

B. Abandoned facilities shall not remain in place within building and pavement areas. Building area is defined as that area within, and extending a minimum of 5 feet outside of, the perimeter of the building and the perimeter of steps, landings, patios, walkways and the like which are contiguous with the building. Pavement area is defined as that area within, and extending a minimum of 3 feet outside of, the limits of asphalt or concrete pavement and the limits of curb, gutter, and sidewalk contiguous with the pavement.

C. If pipelines or conduits are allowed to be abandoned in place outside of building and pavement areas, plug all exposed openings with stiff concrete placed within the pipeline/conduit to a minimum of five (5) lineal feet beyond the opening and rodded to remove voids. All such plugging operations shall be observed by the Construction-Phase Geotechnical Engineer.

3.04 BACKFILLING VOIDS

A. Immediately replace voids or disturbed areas created during clearing and demolition operations, and which extend below the recommended over-excavation depth, with native fill compacted to at least 90 percent relative compaction as determined by the latest approved edition of ASTM D1557. Do not place any fill until the underlying soil has been observed by the Construction-Phase Geotechnical Engineer. All fill and backfill shall be observed, tested and approved by the Construction-Phase Geotechnical Engineer.

3.05 CONTAMINATED SOIL

A. If abandoned septic tanks or fuel tanks or other potential sources of contamination or hazardous waste are encountered or if soil, which appears to be contaminated, is encountered, immediately notify the Owner's Representative.

3.06 DISPOSAL

A. Remove from the work area, transport to a suitable location, and legally dispose of all unsuitable soil materials, rubbish, and debris resulting from clearing, demolition, and grading operations.

B. Burning is not permitted.

3.07 DUST CONTROL

A. Employ all labor, equipment and methods required to prevent construction operations from producing dust in amounts damaging to persons, property, vegetation and animals or causing a nuisance to persons occupying buildings in the vicinity of the job site. Continue dust abatement measures until relief is granted by the Owner's Representative.

1. Contractor shall be responsible for any damage caused by dust resulting from his operations.

3.08 EROSION CONTROL

A. Develop and implement an erosion control plan to provide for containment of siltation resulting from storm and other water runoff to prevent damage to the environment and adjacent property.

3.09 TREE PROTECTION

A. All clearing and grading operations within the drip line of trees to remain shall be approved in advance and observed by Landscape Architect or Arborist employed by the Owner.

B. Comply with tree protection requirements, see specification section 32 84 00.

4.00 SUBMITTALS (Not Used)

END OF SECTION

SECTION 03 20 00
REINFORCING STEEL

1.00 GENERAL

1.01 DESCRIPTION

A. Principal work in this Section:

1. Reinforcing steel (rods and mesh) for cast-in place concrete.

2. Accessories such as chairs and tie wires.

B. Related Work:

1. Cast-In-Place Concrete: Section 03 30 00.

1.02 SUBMITTALS

A. Procedure: In compliance with Section 01 33 00.

B. Show Drawings: Submit reinforcement shop drawings for record.

C. Shop Drawings: Submit shop drawings for reinforcement, prepared by a California-registered civil or structural engineer, for fabrication, bending, and placement of concrete reinforcement. Comply with ACI SP-66 “ACI Detailing Manual,” showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete or masonry structures.

1. Submit bar drawings and schedules with the corresponding placing diagrams. Drawings shall be complete for any specific area of Project when submitted.

D. Mill Reports: Submit copies of mill reports and test data for reinforcing steel sampled and tested, prior to starting this work.

1.03 QUALITY ASSURANCE

A. All work shall conform to 2022 Edition of California Building Code as well as Title 24, all Sections of California Code of Regulations.

B. Testing and Reinforcing: Shall comply with CBC 1705A.2, 1705A.3, 1705A4, 1905A, & ACI 318 as applicable. Laboratory Testing is required for all #5 and larger bars to meet requirements of ASTM A 615 or ASTM 706 as applicable. Comply with ACI 318:3.5.2 & AWS D1.4 for welded reinforcement.

C. Inspection: Required after placement of steel for all structural concrete, by IOR (Inspector of Record).

1.04 HANDLING

A. Procedure: In compliance with Sections 01 10 30 and 01 20 30.

B. Electrode Storage: Comply with the combined recommendations of AWS and the electrode manufacturer for storage of electrodes. Do not use electrodes that have been wetted.

C. Delivery: Deliver reinforcement to the site bundled, tagged and marked; handle to prevent damage to material. Use metal tags indicating size, length and other markings shown on placement drawings. Maintain tags after bundles are broken.

D. Store materials at the Project Site to prevent damage and accumulation of dirt and excessive rust.

2.00 PRODUCTS

2.01 REINFORCING STEEL

A. Clean, new stock conforming to specifications below.

B. Rebars:

1. Typical: ASTM A 615; deformed: Grade 60; #4 and smaller ties and stirrups may be grade 40, unless noted otherwise.

2. Welded: ASTM A 706, Grade 60.

C. Welded Wire fabric (mesh): ASTM A 185.

D. Tie Wire: ASTM A 82, 16 gage (minimum) annealed steel wire.

E. Welding Electrodes: AWS A5.1 E70XX Series, low hydrogen, having a minimum yield point of 70,000 psi.

F. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire-bar-type supports complying with CRSI specifications.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs, or precast concrete block chairs with embedded wire ties.

2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs that are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

3. Over waterproof membranes and vapor barriers, use precast concrete chairs to prevent puncturing of membrane.

3.00 EXECUTION

3.01 TOLERANCES

A. Conform to those specified in CRSI Manual of Standard Practice for both fabrication and placing tolerances. Refer also to Drawings.

3.02 FABRICATION

A. Conform to CRSI Manual of Standard Practice. Fabricate in sizes, grades, lengths and bend to shapes indicated on the drawings. Use standard bends using bending tables. Bend bars cold. In case of fabricating errors, do not rebend or straighten reinforcement in a manner that will injure or weaken the material.

B. Reinforcement with any of the following defects will not be permitted in the Work:

1. Bar lengths, depth and bends exceeding specified fabrication tolerances;

2. Bends or kinks not shown on Drawings; Bars with reduced cross-section due to excessive rusting or other cause.

3.03 SOURCE QUALITY CONTROL

A. Submit to the Testing Laboratory copies of mill certificates, for all types and sizes of reinforcing steel, showing the following information:

Source of Steel	Ultimate tensile strength
Description	Elongation percentage
Heat number	Bend test
Yield point	Chemical analysis

B. When materials cannot be identified, the Testing Laboratory will make one series of tests (tensile and bend) from each 2.5 tons, or fraction thereof, of each size and kind of reinforcing steel. Payments for tests shall be borne by the Work of this Section. Make tests on a minimum of 2 separate samples. Sample length: Sufficient to allow tests to be made on as-rolled bar.

3.04 PLACING REINFORCING STEEL

A. General: Provide reinforcing steel in sizes, lengths and bent to shapes as indicated on the drawings; thoroughly cleaned of loose mill scale, rust, oil and all coating will destroy or reduce the bond before placing, and again before concrete is placed. Steel shall be accurately positioned and secured in place.

B. Placing: Comply with the listed reference standards as applicable.

1. ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.

2. CRSI, Manual of Standard Practice.

3. AWS D1.4, Structural Welding Code – Reinforcing Steel.

C. Support: Use dense grooved concrete blocks with embedded wire ties to hold reinforcement above earth at proper distance. Approved wire chairs or bolsters for support of reinforcement in forms in conformance with applicable requirements of CRSI. Provide construction bars to properly space and support steel that is not supported by other means. Position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations.

D. Installation: Conform to ACI 315 and as follows:

1. Reinforcement shall be wired together sufficiently to securely maintain position and shall be lapped as shown or specified. Splices in general shall be staggered.

2. Care shall be taken to maintain proper clearance, 1-1/2-inch minimum between parallel bars (except bars may be tied together at splices).

3. Lapped splices shall be made in a manner to provide laps required by structural drawings.

4. Dowels and bars extending through construction joint shall be secured against displacement before concrete is placed and shall be cleaned of concrete adhering thereto immediately after pour, while encrustations are soft.

E. Field Bending: Bars #4 and smaller may be cold bent in the field provided bends are made with proper bending devices and bends conform to drawings for dimension and CRSI Standards for radius and detail. No bar shall receive more than one bend at any single location for any reason.

3.05 WELDING

A. Welding: Comply with the requirements of AWS D1.4. Before welding, determine the weldability of reinforcing bars by laboratory chemical analysis of the steel. Only steel conforming to the chemical requirements specified in AWS D1.4 may be welded.

B. Welded Splices: Use full penetration butt welds made by the electric-arc method unless indicated otherwise.

1. Use only welders who have passed the AWS standard qualification tests within the previous year.

2. Weld splices shall develop 125% of the specified yield strength of the reinforcing bars, or of the smaller bar in transition splices.

2. Clean bars of oil, grease, dirt and other foreign substances, and flame-dry before welding.

3. Prepare ends of bars in compliance with AWS D1.4. Preheat bars before welding.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

1.00 GENERAL

1.01 DESCRIPTION

A. Principal work in this Section:

1. All Concrete. Concrete mix designs.

2. Formwork.

3. Placement, curing and jointing of concrete and grouting and sacking of concrete surfaces.

4. Setting anchor bolts and dowels.

5. Setting screens and fine grading for slabs on grade.

6. Concrete finishes.

7. Grouting of hollow metal door frames at rated openings.

B. Related Work:

1. Reinforcing Steel: Section 03 20 00.

2. Vapor Barrier Under Slabs-On-Grade: Reference Section 07 26 00.

3. Sleeves, pipes, conduit, hangers, inserts, ties, anchors and miscellaneous hardware to be furnished and located by trades requiring the same.

1.02 REFERENCE STANDARDS

A. ACI 211.1, Recommended Practice for Selecting Proportions - Normal and Heavyweight Concrete.

B. ACI 347-R, Recommended Practice for Concrete Formwork.

C. ACI 305, Hot Weather Requirements.

D. ACI 304, Measuring and Mixing.

E. ACI 308, Compacting and Vibrating.

F. ACI 309, Curing.

1.03 QUALITY ASSURANCE

A. Refer also to Section 01 10 60: All work shall conform to 2016 Edition of California Building Code and State Building Code, Title 24.
Concrete (Chapter 19A).

B. Materials:

1. Portland Cement Tests - ACI 318, 1903A.5, 1903A.6, & 1905A
2. Concrete Aggregates - 1903A.6 & 1905A

3. Reinforcing Bars - 1903A.4, 1905A

4. Batch Plant Inspection – 1705A3.3 & 1705A3.3.1

C. Concrete Quality:

1. Proportions of Concrete – ACI 318 & 1905A.1.

2. Strength Tests of Concrete - 1905A.1.16.

D. Concrete Inspection:

1. Job Site Inspection – Table 1705A.3.3

2. Batch Plant or Weighmaster Inspection – 1705A3.2 & 1705A3.3

E. Tests: All concrete materials shall be tested or certified and reported prior to any use of same.

F. Portland Cement: Shall be mill-tested cement. Certifications of compliance furnished for each shipment of cement, otherwise cement shall be tested by the testing Laboratory.

G. Aggregate Required Tests for Mix Designs: One for job unless character of material changes, material is substituted, or at the request of the Architect.

1. Sieve analysis per ASTM C136.

2. Specific gravity per ASTM C127 and C128, minimum value 2.60.

H. Aggregate Optional Tests: Only if required by the Architect because of questionable materials or sources.

1. Soundness per ASTM C88.

2. Abrasion, L.A. Rattler, ASTM C131.

I. Design Mixes: After acceptance of aggregate and whenever character or source of materials is changed, the laboratory shall furnish mix designs in accordance with ACI 211.1 and CBC 1905A. Mix designs shall indicate the source of aggregates and brands of cement and admixtures used. Mixes designed for pump placement shall be identified as such. Provide mix design for all other compression strengths and detailed uses indicated on the drawings. Contractor shall pay testing laboratory for these design mixes.

J. Molded Concrete Cylinders: 1 set (3) of molded cylinders, each sampling per ASTM C172, made by Laboratory Inspector, for each 50 cubic yards of each day's pour or fraction thereof, or not less than one for each 2,000 square feet of surface area for slabs. One 7 and two 28 - days cylinders shall be prepared and cured in the laboratory per ASTM C31. Cylinders shall be tested for compression per ASTM C19 and shall exhibit the following strengths:

Designation	7 Day	28 Day
3000	2000	3000

K. Core Tests: Only if ordered by the Architect on the basis of deficient cylinder tests or other conditions indicating defective concrete. Cores, if required, shall be cut from locations directed by the Architect, secured per ASTM C42, prepared and tested by ASTM C39. Results of core tests to be evaluated by the Architect. In general, they will be expected to exceed the 28-day specified strengths.

L. Batch Plant Inspection: By Laboratory Inspector. Continuous inspection required for all structural concrete. Bonded Weighmaster affidavits acceptable for slab and non-structural concrete.

M. Placement Record: A record shall be kept on the site of the time and date of placing the concrete in each portion of the structure. Such record shall be kept until the completion of the structure, and shall be open to the inspection of the enforcement agency.

N. Field Quality Control: Perform work of this Section under the supervision of a capable concrete superintendent. Continuously monitor concrete placing operations to maintain level floors by use of an instrument level, transit or laser.

O. Mock-Up: Before beginning work, cast a 10 ft. x 10 ft. sample panel of the exposed aggregate concrete at a location on the site agreed upon with the Architect.

1. Use same concrete mix, placing, consolidating and finishing methods and workmen as for the finish work.

2. Protect panel until its removal is authorized by the Architect. Make such modifications as necessary to achieve a panel satisfactory to the Architect.

3. Approved panel shall serve as the standard for all remaining work. Remove panel only after completion and acceptance of exposed aggregate flatwork.

2.00 MATERIALS

2.01 CONCRETE:

A. Portland Cement: ASTM C150, Type II, low alkali.

B. Aggregates: ASTM C33 and C330 for expanded shale and as specified. Each size graded and batched separately. From approved pits.

1. Fine Aggregate: Washed natural sand or hard strong particles, and shall contain not more than 1% deleterious material and not more than 2.5% shall pass the No. 200 sieve.

2. Coarse Aggregate: Clean sound washed gravel or crushed rock, evenly graded. Crushings may constitute not more than 30% of the total volume. Not more than 5% flat, thin, elongated or laminated material. Not more than 1% deleterious substances.

3. Alkali Reaction: Do not reactivate aggregate nor use aggregates that are alkali reactive when tested in accord with ASTM C127, ASTM C289, or ASTM C295.

4. Maximum coarse hardrock aggregate size:

   a. General: 1”

   b. In slabs on grade: 1”

5. Hardrock Concrete: Washed sand gravel (from acceptable pits), ASTM C33, including requirements for sampling and testing.

C. Admixtures: Water-reducing admixture conforming to ASTM C494 shall be used in all slab and superstructure concrete. Foundation concrete optional.

D. Fly Ash: Conform to ASTM A618, Class C or F. Fly ash shall not exceed 15 percent of total cementitious material by volume.

E. Water: From domestic sources, clean and free from harmful amounts of acids, alkalis, oil, organic or other deleterious materials and with no pronounced taste or odor.

F. Curing Compound:

1. Liquid membrane-forming compound complying with ASTM C309, Type I (1D), Class B, guaranteed not to affect the appearance of the concrete surfaces, and the bond, adhesion, or effectiveness of finishes and surface treatment specified herein to be applied to concrete.

2. Curing compound used on exposed concrete surfaces shall be non-discoloring, fast drying and shall be conclusively demonstrated not to darken or yellow with age.

3. Curing compound for use on concrete floors to receive adhered covering shall be specially formulated for such use and shall be certified by the manufacturer not to inhibit the bonding qualities of flooring adhesives.

G. Surface Retarder: Rugasol C/S by Sika Chemical Corp. or True Etch Surface Retarder by Burke Co.

H. Abrasive Aggregates: Silicone carbide 12/30 grading, aluminum oxide 14/36 grading or emery grits made by one of the following manufacturers. Use only one type on Project.

1. Conrad Sovig Co., Inc.

2. Chemrex, Inc./Sonneborn.

3. Carborundum Co.

4. Norton Co.

5. Anti-Hydro Co.

6. L&M Construction Chemicals, Inc.

I. Structural Adhesive: ASTM C881, 2-component material suitable for use on dry or damp surfaces. Provide material “Type”, “Grade”, and “Class” to suit project requirements.

1. Rezi-Weld 1000 by WR Meadows.

2. Thiopoxy by WR Grace.

3. Sikadur Hi-Mod by Sika Chemical Corp.

4. Patch and Bond Epoxy by The Burke Co.

J. Sealer: One of the following:

1. Cure-Hard by WR Meadows (sodium silicate).

2. Ashford Formula by Curecrete Chemical Co. (sodium silicate).

3. Lapidolith by Sonneborn (magnesium or zinc fluosilicate).

4. Chem Hard (magnesium fluosilicate), Fluohard (magnesium fluosilicate) or Seal Hard (siliconate/sodium silicate) by L&M Construction Chemicals, Inc.

5. Saniseal 50 by Master Builders Co. (magnesium or zinc fluosilicate).

K. Expansion Joint Materials:

1. Joint Filler: Use in combination with plastic joint cap made by Greenstreak, Quaker Plastic Corp., WR Meadows, or equal.

a. Homex Expansion Joint by Homasote Co., or equal non-bituminous product compatible with sealant specified in Section 07920.

b. Sealtight self-expanding cork by WR Meadows, or equal compatible with sealant specified in Section 07920.

2. Joint Sealant and Back-Up Rod: As specified in Section 07920.

L. Non-Shrink Grout: As hereinafter specified.

2.02 FORMWORK:

A. General: All forming materials shall be new material at the beginning of this project. Materials may be re-used during the progress of the job provided they are capable of producing the formwork requirement for that use.

B. Studs, Wales, Shoring, Centering, Bracing: "No. 2" grade or better D.F. of designed adequate size utilizing doubled wales.

C. Unexposed Surfaces: Unoiled DFPA "Plyform B-B"; Douglas Fir "Standard", "T&G" or "Shiplap" boards, and patented modular forms.

D. Exposed Surfaces: Use APA Ext. Plyform B-B, unoiled. Columns: Smooth plastic coated fiber or Jefferson Smurfit or MFG by Burke Company.

E. Chemical, surface-conversion type form release agent: Shall be applied and reapplied for each reuse to new and cleaned forms. "Nox-Crete Form Coating" by Nox-Crete Chemical, Inc., "Formshield" by W.R. Grace & Company, "Release" by the Burke Co., are acceptable.

2.03 NON-SHRINK GROUT

A. Required for setting bolts, base plates, and dowels in new and existing concrete. Grout shall be Sika Grout 212 as indicated on Drawings. Use in accord with manufacturer's directions. The grout shall be pre-mixed and shall require only the addition of water at the Project Site. Properly clean all existing surfaces of foreign materials prior to grouting operations.

B. Dry Pack: Specified on Drawings, Sheet S-1.

3.00 EXECUTION

3.01 FORM CONSTRUCTION

A. Shall conform to ACI 237 and to the following additions and clarifications:

1. Tolerances: The tolerances shown in ACI 347 shall govern.

2. Plywood: Forms used for exposed concrete shall have all joints level, backed by studs or blocking, filled and sanded smooth. Holes for ties in forms shall be 1/16 inch maximum oversize to prevent leakage of paste.

3. Chamfer corner of all exposed concrete as indicated or as directed, using milled, tightly-set wood chamfer strips or pre-molded rubber strips.

4. Wood and other below-grade formwork shall be completely removed.

5. Coordination: Provide slots, openings, chases, recesses, grounds, nailers and screens required by other trades and subsequent work. Assure that they are secured in forms before placement of concrete.

6. Wood in forms: No wood, temporary or permanent, to be used or installed inside forms, except for item specified.

7. Sides or footings may be formed by neat excavations if banks will stand without caving and the neat trenches are cut 1 inch wider each side than footing dimensions on drawings. Protect edges of excavations with planks staked in place. If banks cave, widen trenches and form footings.

3.02 CONSISTENCY

A. Water shall not exceed amount permitted in mix designs. To be checked by the slump test, ASTM C143, made when test cylinders are cast, and additionally as required. Maximum slumps are indicated on the Drawings.

3.03 MIXING OF CONCRETE

A. Mix concrete by transit mixers only in accordance with ASTM C94, unless otherwise specified.

B. Mixing Time: At least 3 minutes after all water is added to mixture not less than one minute of which is immediately prior to discharge at Project Site.

C. Final Position: Place transit mixed concrete in final position within 1-1/2 hours after water is first added to the batch, and at the time of placing, the concrete shall be in such condition that it will flow readily into position. Retempering is not permitted.

D. Water: Concrete at point of delivery shall have 1-1/2 gallons per cubic yard of required water withheld to be added at job site. Mix 5 minutes minimum after last water added.

E. Load Tickets: In addition to Contractor's copy, legible copy of all load tickets from manufacturer shall be delivered to the Laboratory with each load stating quantities of all constituents in each load, bearing signature of the Weighmaster. Contractor shall keep record of his copy, slump and location in structure of each load and keep all tickets at the job.

F. Certification: Transit mixed concrete supplier shall be a manufacturer licensed by the governing municipality. The manufacturer of transit mixed concrete shall deliver to Project Site a delivery ticket with each mixer truck. These delivery tickets shall specify type of concrete and weight of materials as noted in mix design and shall be signed by a State Licensed Weighmaster.

3.04 SLAB CONTROL JOINTS

A. Joint Spacing: Exterior - provide joints at 16 ft. maximum spacing. Locate joints coincident with architectural building features and as directed by the Architect.

B. Interior Slab Control Joints at Locations Indicated: Install specified control joint simultaneously with slab floating operation in conformance with manufacturer's directions. In general, locate at 20 feet on center maximum.

3.05 CONSTRUCTION JOINTS

A. Provide construction joints at locations required. See plans for joint detail. Subject to prior approval of the Architect.

B. Obtain approval of where placing of concrete shall stop or start. The flow surface of freshly poured concrete shall be level whenever any pour is stopped, with tight dams as necessary to accomplish this. Provide keys and dowels at construction joints where that concrete pour is interrupted. Properly prepare clean, rough joint surfaces.

C. Make construction joints at points shown or as acceptable to the Architect.

D. Permit no concrete to harden on any portion of forms or reinforcement prior to final depositing of concrete.

E. Pours, compact and rod floor slabs to the level and thickness shown.

3.06 ANCHORAGE MISCELLANEOUS METAL AND INSERTS

A. Provide and install, or install those provided by others, accurately, in sizes and in locations shown or required.

1. No pipes permitted in slabs. Conduits over 1/4 slab thickness not permitted. Thicken slab locally to permit this. Conduit in slabs to be middle 1/2 of section. Conduit and piping below slab on grade to be encased in belled slab. Provide sleeves for pipes or conduit required to pass through footings as indicated on the Drawings.

3.07 CONVEYING AND PLACING CONCRETE

A. Clean and wet forms before placing concrete, and clean excavations of loose material.

B. Pouring Against Hardened Concrete Surfaces: Remove laitance and encrustation and expose solidly embedded sound aggregate. Thoroughly wash and moisten previously placed concrete surfaces before placing new concrete.

1. Contact surface may be washed with clean water under pressure (jet blast), may be sandblasted, or in areas which will be concealed from view when the building is completed an approved structural adhesive may be used on clean, structurally sound concrete. Remove wash water entirely from surface.

C. Method of Placing: As nearly as possible in final position with minimum handling. Free drop, not more than 4 feet. Use pump, tremies, spouts, dump boxes and ports in formwork to reduce drop.

D. Placing: Comply with requirements of ACI 301. Keep concrete as level as possible, with a minimum flow from one portion of the work to another. Place concrete with a workable, non-segregating mixture. Tamp and vibrate so as to produce a dense smooth job, free from rock pockets and voids. Use acceptable trunks and chutes where free drop exceeds 6 feet.

E. Pumped Concrete:

1. General: Do not use aluminum or joint lined pipe. Prevent concrete from contacting aluminum fittings.

2. Mix: Do not add more water to mix than maximum allowed on delivery ticket when a slump desired is greater than that initially in pump. Check that mix design entered on delivery ticket complies with that ordered.

3. Pumps: Use only piston type pumps. Insure that they are reversible. Make standby pump available of no less capacity than that in use for operation at the Project Site within one hours' notice.

3.08 PUMP METHOD OF PLACING

A. Concrete mix shall conform to requirements of these specifications, designed specially for pump placement and shall contain a proportion of fine aggregate not greater than 47% of the total aggregate volume, by loose dry volume, and shall entrain not more than 5% air.

B. Capacity: Pumps used shall have a demonstrated capacity to deliver to the forms not less than 22 cubic yards per hour of the types of mixes required by these specifications, at the specified slumps, under average job conditions or those required by this work. Regular field service records shall be the only acceptable evidence. Do not use grout pumps for any concrete.

C. Specified slumps shall not be exceeded and shall be frequently checked at both the pump and discharge ends. Slumps at both ends shall agree within 1 inch. Governing slump shall be that obtained at the discharge end.

3.09 PLACEMENT OF CONCRETE SLABS

A. Preparations: Fine grade subgrades smooth and level and sprinkle well just prior to placing concrete. Broom and wash clean from surfaces, leaving no standing water. Place screed on adjustable screed support systems that will provide accurate support and will not penetrate the vapor barrier. Verify that all reinforcing steel and other embedded items are in correct position and properly secured.

1. Surface Preparation: Before concrete is deposited upon or against concrete that has taken its initial set or has hardened, remove all encrustation from the forms and reinforcement, and mechanically roughen hardened concrete to minimum 1/4-inch coarseness amplitude.

    a. Remove all laitance, oil, and loose particles from concrete; clean concrete surfaces and forms thoroughly by washing with water under stiff pressure, or sandblasting, if necessary, to obtain the specified condition.

    b. Remove laitance after concrete has partially hardened (not less than two nor more than four hours after placing) by brushing with stiff bristles or by directing a stream of water from a 1/4-inch nozzle, or other acceptable method, to expose clean top surface of aggregate.

    c. Where cleaning is not satisfactory to the Architect, sandblast surface and then wash again.

B. Placement: Place at a rate not faster than concrete can be properly leveled and compacted, and at point of final repose, directly ahead of the screed bar, vibrating mass just ahead of the screed. Screed twice, the first to strike a full, rough level and move the concrete mass ahead. Follow this with necessary filling of low areas and another screeding to final level. Remove any puddles of "soup", pull screeds and screed supports and fill all depressions, and tamp with flat-surface or mesh tamper only enough to embed coarse aggregate to permit finishing, a maximum 1/8 inch, allowing as much time between tampings as weather conditions will allow.

C. Leveling and Floating: Level using only wood or magnesium surfaced leveling floats. Steel flat blades shall not be used. Commence fog spray curing as specified below directly following this operation. Allow to stand until water sheen disappears from surface. Power float surface to even surface, producing levels or slopes indicated on Drawings. Surface tolerance to be true to within 1/4 inch in 10 feet, any direction. Follow with trowelling or other finishes as specified.

3.10 COMPACTING AND VIBRATING CONCRETE

A. Compact all concrete by vibrating with high-frequency vibration equipment producing not less than 10,000 cycles per minute to assure uniform density, aggregate distribution, and that mix reaches all parts of the form and encloses all reinforcing, hardware and inserts. Compacting and vibrating of concrete shall be as specified in ACI 308.

B. Vibration: Vibrate all concrete placed. Do not vibrate steel or forms. Do not transport concrete in forms with a vibrator. Use vibrators in horizontal position only in slabs and shallow sections and do not drag.

    1. Vibrate in uniform vertical penetrations spaced about 12 in. o.c., rapidly plunging the vibrator to the bottom of preceding lift, then slowing withdrawing in an upward and downward motion until the top of the vibrator head appears at the surface of the concrete.

C. Re-Vibration: Place concrete containing retarding admixture, if approved, by a schedule that allows layers of concrete to be in place and compacted for at least 30 minutes before next layer of concrete is placed. Remove bleed water on the concrete surface and from forms and re-vibrate the concrete down as far as the concrete is plastic before placing the next layer.

D. Correction of Segregation: Before placing next layer of concrete, and at top of last placement for vertical elements, remove concrete containing excess water or fine aggregate or showing deficiency of coarse aggregate and fill the space with compacted concrete of correct proportions.

E. Slabs: Compact and tamp concrete and bring 1/8 to 1/4 inch of mortar to surface. Wood float to straightedges and screeds. Do not use steel or plastic floats of any kind for initial floating operations. Do not apply finish until all surface water disappears and surface is sufficiently hardened. Remove bleed water and laitance as it appears.

3.11 CURING OF CONCRETE

A. Cure all concrete for at least 10 days. Forms maintained tight and wet are considered adequate curing. Fresh backfill is adequate curing for subgrade walls and foundations. Exposed concrete surfaces shall be cured by use of fine mist-type fog spray continued without interruption until the final trowellng when concrete has attained final permanent set and bleeding has stopped. Then apply specified liquid membrane curing material in strict accordance with the manufacturer's instructions. Curing of concrete shall be as specified in ACI 309.

B. Adequately protect all exposed concrete surfaces from damage which might result from work of other trades, on or about the Project, until final acceptance of the Work. Comply with applicable ACI requirements to secure satisfactory concrete in either hot or cold weather.

3.12 REMOVAL OF FORMS

A. Forms, shoring and centering shall not be removed until concrete has cured sufficiently to permit safe removal. Shoring shall not be removed until the member shored has acquired sufficient strength to support its weight and the load upon the member including all construction loads. When forms are stripped there must be no excessive deflection or distortion and no evidence of damage to the concrete, due either to removal of support or to the stripping operation. When forms are removed before the specified curing is completed, measures should be taken to continue the curing. Conform to the following stripping times unless modified by the Architect or safety requirements are greater:

1. Footings and footing walls - 2 days
2. Walls - 24 hours
3. Columns - 24 hours

B. Take care in removing forms from exposed surfaces that surfaces are not marred or gouged, that corners are true, sharp and unbroken. Break back snap ties or disassemble 3-part ties, without spalling tie holes.

C. No steel spreaders, ties or other metal shall project from or be visible on any concrete surface.

3.13 FINISHING FORMED SURFACES

A. Surface of formed concrete which will remain exposed in the finish work, both interior and exterior, including surfaces which will be painted, shall, when finished, have surfaces uniform for the intended texture; free from imperfect joints, fins, "honeycombing", air pockets or "bug" holes, or other such imperfections.

B. Remove rough spots, stains and hardened mortar or grout from intended smooth surfaces by rubbing such surfaces lightly with fine carborundum stone. Use liberal amount of water and rub sufficiently to remove defects without changing texture of concrete while concrete is green, immediately after specified form removal.

C. If intended smooth surfaces are not uniform texture, treat as follows:

1. Prepare mix consisting of one part portland cement, 1-1/2 parts fine sand, and sufficient water to product a grout of the consistency of thick paint.

2. Wet surface to be treated and apply grout uniformly with a brush, completely filling air bubble holes. Immediately float, scouring the surface vigorously. Allow cement grout to partially set for an hour or two, depending on weather.

3. When grout has sufficiently hardened so it can be scraped from surface with the edge of a steel trowel without removing grout from small air holes, cut off all that can be removed with a trowel, allow surface to dry thoroughly, then rub vigorously with burlap to completely remove surplus.

4. Further finish exposed intended smooth surfaces, if necessary, by means of honing with a carborundum stone to uniform surfaces as acceptable to the Architect.

5. Complete entire operation for any area the day it is started.

6. Do not use dry cement sacking.

3.14 CURING VERTICAL SURFACES

A. Thoroughly wet forms containing concrete, including the tops and exposed portion of concrete, and maintain in a thoroughly moist condition until the forms are removed, but not less than 7 consecutive days from time of placing concrete.

1. Continuously wet concrete between the hours of 8:00 a.m. and sunset each day, including Saturday, Sunday, and Holidays, for the first 4 days, and not less than 3 times daily for the 3 remaining days until the concrete reaches design strength.

3.15 CONCRETE SLAB FINISH

A. Interior - Trowelled per paragraph 3.09C.

B. Exterior Slabs:

1. Typical: Medium broom non-slip.

2. Abrasive aggregate (slip-resistant) finish for stair treads and landings where applied finishes are not used.

a. Broadcast abrasive aggregate on the concrete, after first troweling operation uniformly at the rate of 25 lbs. per 100 sq. ft. Use caution not to bury the abrasive aggregates during second troweling.

b. After second troweling, rub surface with pads of steel wool to remove film of cement and expose the abrasive aggregates, or as an option etch concrete with a 10% solution of muriatic acid followed by flushing with water to remove all traces of acid and expose the abrasive aggregates.

C. Markings:

1. At expansion joints and elsewhere as indicated, mark slabs with a 1/4 inch radiused edging or marking tool. In textured work edge and mark slabs, after texturing, with a combination edging/smoothing tool approximately 1-1/2 inch wide.

2. Where saw cutting is indicated, time this operation so that it is performed as soon as concrete has hardened sufficiently to prevent aggregates being dislodged by the saw, but before shrinkage stresses have developed sufficiently to produce cracking.

3. Make marking lines straight, or curved as indicated, equally spaced and parallel to adjacent lines and/or walls, edges and other construction, and of uniform depth and cross section, with intersections accurately formed.

3.16 DEFECTIVE CONCRETE

A. Concrete work that is not formed as shown, is not true to intended alignment, not plumb and level where so shown, not true to line or grade, or which has irreparable voids or rock pockets, wood or debris embedded in it, or does not fully conform to these Specifications, will be deemed faulty material and workmanship.

1. Remove such work from Project Site and replace with concrete complying with requirements of these Specifications, at no extra cost to the District.

B. If compressive tests of concrete cylinder specimens fail to show compressive strength specified, the Architect may require tests to be made of core samples taken from the placed concrete represented by the unsatisfactory test samples and shall be paid by the Contractor for testing.

1. Take and test in accord with ASTM C42.

2. If the results of core tests show that the compressive strength is less than specified, concrete will be deemed defective, and shall be replaced in a manner acceptable to the Architect, at no extra cost to the Owner.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL

PART 1 – GENERAL

1.1 SCOPE

A. Requirements of Division 1 apply to this Section.

B. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to complete the Contract, including, but not limited to, these major items:

1. All structural steel framing, including plates and channels.

2. Base plate and furnishing anchor bolts.

1.2 RELATED WORK SPECIFIED ELSEWHERE AS REQUIRED

A. Miscellaneous metalwork.

B. Setting anchor bolts and grouting base plates.

1.3 GENERAL REQUIREMENTS

A. Codes: All work to conform to Chapter 22A of Title 24, of the California Building Code latest Edition, and Chapter 22A, of CBC 2022.

B. Shop Drawings: In accordance with section 01 33 23, submit complete checked shop drawings as required for this work.

1. Improper Corrections: Should the Architect, in reviewing shop drawings, make corrections that would cause incorrect fitting or reduced strength, give written notice of such fact at once, so that the correction may be modified before the work affected is started.

2. As-Built Drawings: After this work has been erected, correct or revise the originals of the reviewed shop drawings and erection diagrams to correspond with field changes.

C. Test and Inspections: The Owner will pay for all tests and inspections of completed installation of this work. Costs of all tests and inspections at materials sources, and costs of retests of rejected work, shall be borne by the Contractor. Arranging for scheduling of tests and inspections shall be the responsibility of the Contractor. See Section 01 45 29 for testing requirements.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Materials: New tested stock of domestic manufacture, complying with standard specifications hereinafter referenced. If foreign materials are used, they shall meet or exceed the requirements of all authorities having jurisdiction.

B. Machine Bolts: A307, and ANSI B18.2, 36 square or hexagonal heads.

C. Paint: Use primer as specified under Painting Section.

D. All Structural Steel shall conform to ASTM A-36 except for wide flange shapes shall conform to ASTM A-992.

E. Structural Pipe Columns: ASTM A53, Type S, Grade B.

F. Grout: "Por-Rok" as manufactured by Minwax Construction Products Division. Grout compressive strength shall not be less than 4000 psi.

G. Structural Tubes: ASTM A500, Grade B.

H. Arc-Welding Electrodes: Conform to requirements of AWS; as required for the conditions of intended use.

1. All welds on members comprising the Seismic-Force-Resisting System shall employ weld filler metals classified for nominal 70 ksi tensile strength, referred to as E70 electrodes, meeting the following minimum mechanical property requirements:

a. CVN toughness of 20 ft-lb at 0°F, using AWS A5 classification test methods

b. CVN toughness: 40 ft-lb at 70°F.

c. yield strength: 58 ksi minimum, using both the AWS A5 classification test (for E70 classification electrodes).

d. tensile strength: 70 ksi minimum, using both the AWS A5 classification test (for E70 classification electrodes).

e. Elongation: 22% minimum, using both the AWS A5 classification test.

2. Packaging Requirements of weld filler metals shall conform to the requirements of AWS D.1.1. FCAW electrodes shall be received in moisture-resistant packages that are undamaged. They shall be protected against contamination and injury during shipment and storage. Electrode packages shall remain effectively sealed against moisture until the electrode is required for use. When removed from protective packaging and installed on machines, care shall be taken to protect the electrodes and coatings, if present, from deterioration or damage. Modification or lubrication of an electrode after manufacture for any reason is not permitted, except that drying shall be permitted when recommended by the manufacturer.

2.2 TESTS

Identified Material: If material is properly identified, mill reports will be accepted.

Unidentified Material: One tension and one bend test for every 20 tons or fractional part thereof. Submit copies of all test reports to the Architect a reasonable time before starting fabrication.

2.3 TESTS OF WELDING AND BOLTING

A. Testing agency shall inspect all shop and field welding, and furnish qualified deputy inspectors, approved by the Architect and Division of the State Architect. Testing and inspection shall comply with all regulations of the Division of the State Architect. Testing agency shall certify in writing, upon completion of the work, that the welding has been performed by fully qualified welders in accordance with drawing and specifications requirements and with all applicable requirements of regulatory agencies having jurisdiction.

B. Weld Acceptance Criteria

1. Engineer's Authority: Welds or portions of welds that fail to meet the acceptance criteria of AWS D1.1 shall be repaired or replaced.

2. Magnetic Particle Testing: If a surface discontinuity or near-surface discontinuity, within 1/8 inch of the surface, is detected, the discontinuity shall be rejected and removed. If the separation from the surface cannot be determined, the discontinuity shall be categorized as a surface flaw, rejected and removed.

2.4 PAINTING

A. Thoroughly clean structural steel of loose mill scale, grease, dirt and foreign matter, by thoroughly scraping, wire brushing or sandblasting, and apply paint to a dry film thickness of one mil.

PART 3 - EXECUTION

3.1 FIELD MEASUREMENTS

A. Before starting work obtain measurements pertaining to this work, and verify the locations and exact positions of concrete supports and anchor bolts.

3.2 WORKMANSHIP

A. Workmanship: Equal to the best standard practices in modern structural shops, conforming to applicable provisions contained in the AISC Code of Standard Practice, except where these requirements herein govern.

B. Injury and Excessive Stress: Transport, handle and erect structural steel, in shop and field, to preclude injury. Do not subject material to excessive stress in any part or connection.

C. Welded Construction

1. Each welder working on the project shall be assigned an identification symbol or mark. Each welder shall mark or stamp this identification symbol at each weldment completed. Stamps, if used, shall be the low-stress type.

2. Welding personnel shall be qualified in accordance with AWS D1.1, Section 4, Parts X and C. WPQR testing performed more than six months prior to the start of the welding by the welder is acceptable, provided written documentation is submitted showing that the welder has continued to use the applicable welding process on an ongoing basis since the test was conducted, with no lapse in service exceeding six months. Welders whose work routinely exhibits poor workmanship shall be requalified before performing further welding.

3. WPSs shall be available to welders and inspectors prior to and during the welding process. Prior to welding, joint fit-up shall be verified by the welder for conformance with the WPS and AWS D1.1.

4. For all complete joint penetration (CJP) and partial joint penetration (PJP) groove welds subjected to ultrasonic testing (UT), a visible mark, “for UT,” shall be accurately placed on the steel a distance of 4 inches away from the root of the edge preparation.

5. Welding shall be performed in accordance with the appropriate WPS for the joint.

6. Groove welds shall be complete joint penetration groove welds, unless specifically designated otherwise on the Drawings. Groove preparation details are at the Contractor’s selection, subject to qualification, is required, in accordance with AWS D1.1.

7. Faces of fillet and groove welds exposed to view shall have as-welded surfaces that are reasonably smooth and uniform. No finishing or grinding shall be required, except where clearances or fit of other items may so necessitate, or as preparation for coating.

D. Supplemental Welding Personnel Testing and Qualification Period.

1. Welders and welding operators shall pass Supplemental Welder Qualification Testing, as prescribed in Appendix B, on special test joint mock-ups. Testing shall be performed using the process to be used in the work, with the WPS set at the highest deposition rate to be used in the work. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification. Tack welders need not perform such Supplemental Testing.

2. Welding personnel required to be tested using the Supplemental Welding Personnel Testing prescribed in Section 3.3.1.1 shall be qualified by test within 12 months prior to beginning welding on the project.

3. Should the 12-month period elapse during welding on the project, the Supplemental Welder Qualification remains valid. It is not required to repeat the testing during the course of the project, unless the quality of the workmanship for that welder routinely fails to meet the applicable project weld quality standards.

3.3 FABRICATION AND ASSEMBLY

Before being fabricated or worked, material shall be thoroughly wire brushed, cleaned of loose mill scale and rust, and straightened by methods that will not injure it. After punching or working the component parts of a member, remove twists or bends before the parts are assembled. Finished members shall be free from twists, bends, and open joints when erected.

Field Joining: Members and sections shall be of sizes, weights, shapes, and arrangements indicated, closely fitted, and finished true to line and in precise position necessary to allow accurate erection and proper joining of parts in the field. Drifting to enlarge unfair holes will not be allowed. Rolled sections, except for minor details, shall not be heated without prior approval.

Contact: Component parts of built-up members shall be well pinned and rigidly maintained in close contact using clamps or temporary bolting during welding. Compression joints depending upon contact bearing shall have bearing surfaces accurately milled perpendicular to their axes, or as detailed.

A. In additional to special care used to handle and fabricate AESS, comply with the following:

1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes.

2. Grind sheared, punched, and flame-cut edges smooth

3. Fabricate with exposed surfaces free of mill marks.

4. Fabricate with exposed surfaces free of seams to maximum extent possible.

5. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.

6. Fabricate with piece marks fully hidden in the completed structure or made with media that permits full removal after erection.

7. Fabricate to the tolerances specified in AISC 303 for steel that is designated AESS.

8. Seal-weld open ends of hollow structural sections with 3/8-inch (9.5-mm) closure plates.

B. Coping, Blocking, and Joint Gaps: Maintain uniform gaps of 1/8 inch (3.2 mm) with a tolerance of 1/32 inch (0.8 mm)

3.4 GAS CUTTING

A. When permitted by the Architect, use of a cutting torch is allowed where the metal being cut is not carrying stress during the operation, and provided stresses will not be transmitted through a flame-cut surface. Make gas cuts smooth and regular in contour. To determine the effective width of members so cut, deduct 1/8" from the width of the gas cut edges. Make the radius or re-entrant gas cut fillets as large as practicable, but in no case less than one inch.

3.5 PUNCHING, DRILLING AND REAMING

A. Material may be punched 1/16" larger than the nominal diameter of the bolt for standard bolt holes. Holes for anchor bolts are oversized to facilitate erection as follows:

Bolts	¾” to 1”	5/16” oversize
	1” to 2”	½” oversize
Bolts over 2”		1” oversize

B. Holes shall be drilled or sub-punched or reamed. The diameter for sub-punched holes, and the drill for sub-drilled holes, shall be 1/16” smaller than the nominal diameter of the bolt to be accommodated. Precisely locate finish holes to insure passage of bolts through assembled materials without drifting. Poor matching of holes is sufficient cause for rejection.

3.6 WELDING

A. Welding and Welded Joints: Detail and execute in accordance with the requirements of the American Welding Society standards and as modified by AISC Specifications or as detailed and noted on the drawings. In the event of conflict, the notes and details on the drawings take precedence. Structural welding shall be done by Low Hydrogen, CO2, Innershield or Submerged Arc.

B. Electrode Storage and Exposure Limits.

1. FCAW electrodes shall be receive and stored in the original, undamaged manufacturer packaging, until ready for use. Electrodes in packages that have had the internal plastic wrapping damaged shall not be used. Modification or lubrication of an electrode after manufacture is not permitted, except that drying is permitted as recommended by the manufacturer.

2. When welding is to be suspended for more than 8 hours, electrodes shall be removed from the machines and stored in an electrode wire oven maintained at a temperature between 250o and 550o F, or as recommended by the manufacturer. Electrodes not consumed within 24 hours of accumulated exposure outside closed or heated storage shall not be used. Electrode spools shall be identified to facilitate monitoring of total atmospheric exposure time. FCAW electrodes that have been exposed for periods exceeding an accumulated 24 hours may be dried if manufacturer’s tasting and recommendations show that drying is effective at removing moisture and restoring electrodes to their designated diffusible hydrogen level.

C. Minimum Preheat and Interpass Temperature.

1. Minimum preheat and interpass temperatures shall be provided for all welds, including tack welds, in accordance with AWS D1.1, Table 3.2. The Contractor may specify higher minimum temperatures, if desired, as a part of the Contractor's WPS for a particular application. In such cases, the WPS minimum reheat and interpass temperatures shall be provided.

2. Preheat and interpass temperatures lower than those required by AWS D1.1, Table 3.2, are permitted provided the WPS has been qualified by test, and the WPS and PQR have been accepted by the Engineer.

3. Minimum preheat and interpass temperatures shall be verified at a distance of 3 in. from the weld, at the joint of arc initiation or for materials over 3 inches in thickness at a distance equal to the thickness of the part.

D. Maximum Preheat and Interpass Temperature

1. The maximum preheat and maximum interpass temperature permitted is 550oF, measured at a distance of 1 in. from the point of arc initiation. This maximum temperature may not by increased by the WPS, regardless of qualification testing.

E. Backing Bar and Weld Tab installation and removal specifications and requirements are shown on the Structural drawings.

3.7 ERECTION

A. Erect structural steel by professional riggers, carefully plan and lay out so that a minimum of cutting will be necessary. Erect the work plumb, square and true to line and level, and in precise positions as indicated. Provide temporary bracing and guys wherever necessary to provide for loads and stresses to which the structure may be subjected including those due to erection equipment and its operations, and leave in place as long as necessary to safeguard all parts of the work.

B. Temporary Connections: As erection progresses, the work shall be securely bolted up as necessary to maintain the steel in proper position while field bolting and welding is being done, and as necessary to take care of dead loads, wind, and erection stresses. No field welding or high strength bolting shall be done until the work has been properly aligned, plumbed and leveled.

C. Set column base plates in exact position, as to alignment, level, and elevation, as well as support on steel wedges, or equivalent until the grout thereunder has thoroughly set. The center of each base shall be true to the column center within 1/16". Adjust elevation to $\pm$1/32". Exactly level plates on both axes.

D. Sequence: Carry out the erection of structural steel in proper sequence with the work of other trades. Frame, bed, and anchor to the concrete and related work in accordance with detailed drawings and reviewed setting diagrams.

E. Erection Tolerance: In accordance with the current AISC Code or Standard Practice for Steel Buildings and Bridges.

3.8 ANCHOR BOLTS

A. Furnish to the site when and as required to maintain job progress, for installation under Concrete Section, all anchor bolts to be embedded in the concrete for the securing of structural steel in position. Provide the necessary drawings and templates for the setting of such anchor bolts in the concrete forms. Be jointly responsible with others for the proper location, and installation, and make good deficiencies and errors. Setting of anchor bolts in hardened concrete, necessitated through error or oversight, shall be made under direction of the Architect in suitably drilled holes solidly grouted in place, embedded in an approved structural epoxy.

3.9 GROUTING OF BASES AND PLATES

A. Be responsible for maintaining bases and bearing plates in proper location and in proper level while they are being grouted and be jointly responsible for a perfect job. Refer to Concrete Section for materials, mix and procedures for grouting of base plates.

3.10 CUTTING STRUCTURAL STEEL

A. Provide cuts in structural steel for mechanical, plumbing and electrical pipes as approved by Architect. Locate as shown on Mechanical, Plumbing and Electrical drawings.

3.11 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.

2. Fill vent and drain holes that will be exposed in the finished work, unless indicated to remain as weep holes, by plugging with zinc solder and filling off smooth.

3. Galvanize attached to structural-steel frame and located in exterior walls.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Supply and install Rough Carpentry work as indicated.

1.2 RELATED SECTIONS

A. Section 01 43 00: Quality Control.

B. Section 01 45 29: Testing and Laboratory Services.

C. Section 03 30 00: Cast-In-Place Concrete.

D. Section 06 20 00: Finish Carpentry.

E. Section 09 29 00: Gypsum Board.

1.3 SUBMITTALS

A. Submittals: Submit in accordance with Section 01 33 00.

1.4 QUALITY ASSURANCE

A. All work shall be performed in accordance with the local codes and the most current DSA requirements. Where there is a question between the specifications, Architect/Contractor shall conform to the most constrictive requirement.

B. Douglas fir, larch or hemlock structural and framing lumber shall be graded in accordance with the "Standard Grading Rules" of the West Coast Lumber Inspection Bureau (WCLIB) or the "Western Lumber Grading Rules" of the Western Wood Products Association (WWPA) latest editions.

C. Redwood structural and framing lumber shall be graded in accordance with "Standard Specifications for Grades of California Redwood Lumber" of the Redwood Inspection Service, latest edition.

D. Each piece of lumber shall bear official grade mark of the association under whose rules it was graded, or official grade mark of another recognized grading agency using grading rules herein specified.

E. All 2x structural and framing members shall be air-dried to a moisture content not to exceed 19% before use.

F. Work of this Section shall comply with provisions of current edition of UBC and Title 24, see Section 01 45 29: Testing and Inspection.

G. Plywood shall conform to requirements of "Product Standard PS 1 issued by the U.S. Department of Commerce, and shall be grade marked by a recognized grading agency (APA and PTL).

H. Each piece of preservative treated lumber shall be identified by the Quality Mark of an approved inspection agency in accordance with Title 24, see Section 01 45 29: Testing and Inspection.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Lumber: Structural and framing lumber shall be of the following species and grades unless noted otherwise on the drawings:

USE		SPECIES	GRADE
1.	Subfloor, wall sheathing, roof sheathing and ceiling stripping.	Douglas Fir	"Construction" Board, Structural #1 only WCLIB; WWPA
2.	Beams, girders and truss members (5" and thicker, rectangular, width more than 2" greater than thickness) where exposed as finish members.	Douglas Fir WWPA	Select Structural
3.	Joists, rafters, lintels, posts, mullions and members (2” to 4” thick, 2” to 4” wide)	Douglas Fir	“Structural No. 1 Structural Light Framing, WCLIB;
4.	Other lumber (2" to 4" thick, 2" to 4" wide) not specified in subparagraph 5 above.	Douglas Fir	"Structural No. 1" and Framing WCLIB; WWPA
5.	Framing lumber (2" to 4" thick, 5" and wider).	Douglas Fir	"No. 1" and better Joists and Planks, WCLIB; WWPA.
6.	Mudsills and plates in contact with soil.	Douglas Fir treated	Same as subparagraphs 5 and 6.
7.	Sills or plates resting on concrete or masonry surfaces 6" or less above soil or finish grade.	Douglas Fir treated	Same as subparagraphs 5 and 6.
8.	Sills, foundations plates & sleepers which rest on concrete, masonry foundations, or are laid on concrete on concrete slab in direct contact with soil.	Douglas Fir treated	Same as subparagraphs 4 and 5.
9.	Miscellaneous nailing strips and blocks embedded in concrete or masonry.	Douglas Fir treated	Same as subparagraphs 4 and 5.

B. Plywood: Plywood used for structural purposes, shall be APA grade Structural I plywood. Plywood used for non-structural exterior purposes shall be exterior type, or Exposure 1. Plywood used for non-structural interior purposes shall be 3/8” AC plywood.

C. Preservative Treated Wood:

1. Wood and plywood specified as treated wood shall be pressure treated wood in accordance with CBC 2303.1.8.

2. Seasoning: Treated lumber shall be air seasoned after treatment, for a minimum of 2 weeks before use.

3. Creosote shall not be used for treating wood in contact with painted or plastered surfaces.

4. When treated wood member has been notched, dapped, drilled or in any way cut into, such newly cut surfaces shall be painted with a heavy coat of same preservative material used in treatment of wood member.

D. Fire Retardant Protection: Wood and plywood specified as "Fire Retardant Protected Wood" shall be treated by approved methods and materials, and shall be dried, following treatment, to a maximum moisture content as follows: Solid sawn lumber 2" in thickness or less to 19%; and plywood to 15%.

E. Mineral Fiber Panels: Shall be asbestos free, thickness as indicated.

F. Reused Materials: Sound lumber and timber which has been used for formwork may not be reused for stress carrying or non-stress carrying members. May not be used in any construction other than formwork.

PART 3 – EXECUTION

3.1 FASTENINGS

A. Nails and Spikes:

1. Use only common wire nails or spikes.

2. Whenever necessary to prevent splitting, holes shall be prebored for nails and spikes.

3. Nails in plywood shall not be overdriven.

4. Machine Applied Nailing: Use of machine nailing is subject to a satisfactory jobsite demonstration for each project and approval by the Project Architect or Structural Engineer and the Division of the State Architect Field Representative. Approval is subject to continued satisfactory performance. Machine nailing will not be approved in 5/16" plywood. If nailheads penetrate outerply more than would be normal for a hand hammer or if minimum allowable edge distances are not maintained, performance will be deemed unsatisfactory and material may be scrapped.

B. Lag Screws:

1. When placing lag screws in a wood member, prebore lead hole as recommended in CBC Title 24 Sec 23.

2. Lag screws which bear on wood shall be fitted with standard steel plate washers under head. Lag screws shall be screwed and not driven into place.

3. Lag screws applied in moisture rich environments or “wet” timber shall be galvanized to prevent degradation of both the lag screw and the material.

C. Bolts:

1. Lumber and timber to be fastened together with bolts shall be clamped together and holes for bolts bored true to line.

2. Bolts shall be fitted with steel plates or standard cut washers under heads and nuts. Bolts shall be tightened when installed and again just before completion of work.
3. Bolts applied in moisture rich environments or “wet” timber shall be galvanized to prevent degradation of both the bolt and the material.

D. Wood Screws: When placing wood screws, lead holes shall be prebored as recommended in CBC Title 24. Wood screws shall be appropriately selected for the application and treated as necessary to prevent corrosion

E. Framing Anchors: Framing anchors, joist hangers, ties and other mechanical fastenings shall be galvanized or have a rust-inhibitive coating. Nails and fastenings shall be of type recommended by manufacturer.

F. Fasteners in contact with preservative-treated wood: Fasteners shall be hot-dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. Fasteners other than nail, timber rivets, wood screws and lag screws shall be permitted to be of mechanically deposited zinc-coated steel with coating weights in accordance with ASTM B 695, class 55 minimum. Connectors that are used in exterior applications and in contact with preservative-treated wood shall have coating types and weights in accordance with the treated wood or connector manufacturer’s recommendations. In the absence of manufacturer’s recommendations, a minimum of ASTM A 653, Type G185 zinc-coated galvanized steel, or equivalent, shall be used. Exception: plain carbon steel fasteners in SBX/DOT and zinc borate preservative-treated wood in an interior, dry environment shall be permitted.

3.2 ERECTION

A. Stud Walls, Partitions and Furring:

1. Wood stud walls, partitions and vertical furring shall be constructed of members of size and spacing indicated. Provide single plate at bottom and double plate at top unless otherwise indicated. Interior, nonbearing non-shear partitions may be capped with a single top plate, installed to provide overlapping at corners and at intersections with other wall and partitions or by metal ties as detailed.

2. Walls and partitions shall have horizontal staggered blocking not less than 2" nominal thickness and same width as studs, fitted snugly, and nailed into studs. Blocking shall be at mid-height of partition or not more than 7'-0" on center vertically. Install wood backing on top of top plate wherever necessary for nailing of lath or gypsum board.

3. Walls, partitions and furred spaces shall have 2" nominal thickness wood firestops, same width as space to be firestopped, at ceiling line, mid-height of partition and at floor line. Firestops at floor line are not required when floor is concrete. If width of opening is such that more than one piece of lumber is necessary, provide 2 thicknesses of 1" nominal material laid with staggered joints.

4. Firestops shall be placed in all stud walls and partitions, including furred spaces, so that maximum dimension of any concealed space is not over 10'-0".

5. Corners, and where wood stud walls and wood vertical furring meet, shall be formed of triple studs. Openings in stud walls and partitions shall have headers as indicated and a minimum of 2 studs at jambs, one stud of which may be cut to support header in bearing.

6. Where wood masonry or concrete walls intersect, end stud shall be fastened at top, bottom and midheight with one 1/2" diameter bolt through stud and embedded in masonry or concrete a minimum of 4". Bolts shall have washers under nuts.

7. Sills under bearing, exterior or shear walls shall be bolted to concrete with 5/8" rd. by 12" long bolts spaced not more than 4'-0" on center. There shall be a bolt within 9" of each end of each piece of sill. Sills shall be placed and leveled with shims and washers placed and nuts tightened to level bearing after which space between sill and concrete shall be dry packed with cement grout. Non-bearing interior plates may be fastened to concrete with low velocity powder driven fasteners provided Structural Engineer's approval is obtained in writing, prior to use.

B. Furring: Where metal furring is not indicated or specified, provide wood furring at all points indicated and required for concealing conduit, piping, structural framing or other unfinished materials. Wood furring shall be 2x studs of required width. Vertical members contacting concrete or masonry shall be attached as specified for anchoring interior wood stud partitions.

C. Nailing Strips and Plates:

1. Provide wood nailing strips, plates and blocking indicated or required. Nailing strips in connection with metal work shall be bolted to metal. Wood nailing blocks for securing grounds shall be built into concrete, or masonry.

2. Nailing schedule shall comply to Title 24, see Section 01 45 29: Testing and Laboratory Services.

D. Wood Backing: Provide wood backing as indicated and as required to receive plumbing, electrical fixtures and equipment, cabinets, door stop plates and other fixed equipment.

END OF SECTION

SECTION 06 64 00
FIBERGLASS REINFORCED PROTECTIVE WALL COVERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Fiberglass reinforced plastic (FRP) paneling for wall surfaces, including trim accessories.

1.2 REFERENCES

A. General: Standards listed by reference form a part of this specification section. Standards listed are identified by issuing authority, abbreviation, designation number, title or other designation. Standards subsequently referenced in this Section are referred to by issuing authority abbreviation and standard designation.

B. ASTM International:

1. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

2. ASTM D5319 – Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.

3. ASTM D5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).

4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. Crane Composities (Inspired by Kemlite):

1. Installation Guide For FRP Panels #6876.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Conduct preinstallation meeting to clarify Project requirements, substrate conditions, manufacturer’s installation instructions and manufacturer’s warranty requirements.

1.4 ACTION SUBMITTALS

A. Product Technical Data: For each type of product required.

B. Shop Drawings: Showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures. Indicate location and dimension of joints and fastener attachment.

C. Samples: Selection and verification samples for finishes, colors and textures. Submit two samples of each type of panel, trim and fastener.

D. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

E. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

F. Manufacturer's Instructions: Manufacturer's Installation Guide for FRP #6876.

G. Qualifications Statements: For manufacturer and installer.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For installed products including maintenance methods and precautions against cleaning materials and methods detrimental to finishes and performance.

B. Warranty: Warranty documents required in this section.

1.6 MAINTENANCE MATERIAL

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 01 Closeout Submittals Section.

1. Quantity: Furnish quantity of units equal to 5% percent of amount installed.
2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Provider of advanced installer training.

B. Installer Qualifications:

1. At least five years experience in the installation of fiberglass reinforced plastic panels.
2. Experience on at least five projects of similar size, type and complexity as this Project.
3. Employer of workers for this Project who are competent in techniques required by manufacturer for installation indicated.

C. Surface-Burning Characteristics: Determined by testing identical products according to ASTM E84 by a testing agency acceptable to authorities having jurisdiction.

1. Flame-Spread Index: 25 (Class A)] or less.

2. Smoke-Developed Index: [450] or less.

1.8 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site.

B. Storage and Handling: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels in a dry indoor location at Project site. Remove any foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.

1.9 PROJECT CONDITIONS

A. Ambient Conditions:

1. Do not begin installation until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete or terrazzo work has dissipated.

2. During installation, and within 48 hours prior to installation, maintain ambient temperature and relative humidity within limits required by type of panel adhesive used and recommendation of panel adhesive manufacturer.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace FRP panels that fail within specified warranty period.

1. Failures shall include, but not be limited to substantial defects in material and workmanship, rotting, rusting, corrosion, development of structural surface cracks, or requiring painting or refinishing.

2. Warranty Period: Ten years from date of Substantial Completion.

B. Special Warranty: Installer's standard form in which installer agrees to repair or replace FRP panels that fail due to poor workmanship or faulty installation within the specified warranty period.

1. Warranty Period: 1 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBERGLASS REINFORCED PLASTIC (FRP) PANELS

A. General: Fiberglass reinforced plastic panels complying with ASTM D5319.

1. Low-Emitting Materials: Comply with testing and product requirements of California Department of Health Services standards for Volatile Organic Emissions.

B. Basis of Design Product: Subject to compliance with requirements provide Crane Composites, Inc.; Class A Fiberglass Reinforced Plastic (FRP) Panels, or approved equal.

C. Product Options:

1. Color: As selected by Architect manufactures full color line of Class A FRP products.

2. Surface Finish: As Approved.

3. Nominal Thickness: 0.09 inch (2.3 m)

4. Wall Panel Size: 4 feet (1.2 m) by 8 feet (2.4 m)

2.2 ACCESSORIES

A. Moldings, Trim and Caps: One-piece extruded polypropylene or PVC, configured to cover panel edges and corners.

1. Color: 85 White.

B. Panel Adhesive: As recommended by panel manufacturer for the required substrates.

1. Adhesive shall have a VOC content of 50 g/L or less.

C. Panel Sealant: As recommended by panel manufacturer.

1. Sealant shall have a VOC content of 250 g/L or less.

2.3 SOURCE QUALITY CONTROL

A. Obtain fiberglass reinforced panels, moldings and other accessories from a single manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General: Comply with manufacturer's product data, including product technical bulletins, and installation instructions in product catalogs and product packaging.

B. Verify that substrates previously installed under other sections are acceptable for product installation in accordance with FRP manufacturer's instructions.

1. Examine substrate surfaces to determine that corners are plumb and straight, that surfaces are smooth, sound and uniform, that nails or screw fasteners are countersunk, and that joints and cracks are filled flush and smooth with adjoining surfaces.

2. Do not begin panel installation until substrate surfaces are in satisfactory condition.

3.2 PREPARATION

A. Clean substrates to remove substances that could impair bond of adhesive, including oil, grease, dirt, dust or other contamination.

B. Condition panels by unpacking and placing in installation space no less than 24 hours before installation.

C. Lay out paneling before beginning installation. Locate panel joints to provide equal panel widths at ends of walls and so that trimmed panels at corners are not less than 12 inches (300 mm) wide.

3.3 INSTALLATION

A. General: Comply with panel manufacturer's Installation Guide #6876.

B. Cut and drill panels with carbide tipped saw blades or drill bits, or cut with snips.

C. Install panels with manufacturer's recommended gap for panel field and corner joints.

1. Pre-drill fastener holes in panels, 1/8 inch (3.2 mm) greater in diameter than fastener.

2. Install panels in a full spread of adhesive. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.

D. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.

E. Sealant:

1. Fill grooves in trim accessories with sealant before installing panels and bed inside corner trim in a bead of sealant.

2. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths.

3.5 CLEANING

A. Remove temporary coverings and protection of adjacent work areas.

B. Repair or replace any installed products that have been damaged.

C. Clean installed panels in accordance with manufacturer's instructions prior to Owner's acceptance.

D. Remove and lawfully dispose of construction debris from project site.

3.6 PROTECTION

A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION

SECTION 07 11 20
WATERPROOFING MEMBRANE

1.00 GENERAL

1.01 DESCRIPTION

A. Principal Work in this Section:

1. Sheet membrane waterproofing under all ceramic floor tiles and full height behind all ceramic wall tiles.

2. Primer, adhesives, sealants.

B. Related Work:

1. All other waterproofing membranes.

1.02 SUBMITTALS

A. Procedure: In compliance with Section 01 33 23:

B. Data: Submit a list of proposed materials and manufacturer's data for each.

C. Samples: Submit 12 in. samples of waterproofing membrane.

D. Shop Drawings: Submit large scale details of reinforcement, terminations, and penetrations through waterproofed surfaces.

E. Certification: Submit letter from the manufacturer to verify its acceptance of the applicator and acceptance of substrates as satisfactory to receive this work.

1.03 QUALITY ASSURANCE

A. Applicator's Qualifications: Firm with a minimum of 3 consecutive years of experience in application of the waterproofing proposed for use on projects of similar size and scope.

1.04 HANDLING

A. Procedure: In compliance with Section 01 66 00.

B. Storage: Store rolled goods on end.

1.05 WARRANTY

A. Warrant waterproofing against faulty materials and workmanship for 5 years after Substantial Completion.

B. Make repairs required during the warranty period at no cost to the District.

1.06 JOB CONDITIONS

A. Apply waterproofing materials only in dry weather when the outside temperature is above 40 deg. F. Do not apply waterproofing materials to damp, wet or frost covered surfaces.

B. Illuminate work areas during installation to provide the same or greater level of illumination, as required to properly perform this work, as will occur in the room or space after the building is in operation.

2.00 PRODUCTS

2.01 MATERIALS

A. Membrane: One of the following.

1. All Type B waterproofing membrane shall be from the Schluter-Kerdi line of products by Schluter Systems – no substitutions. Provide all labor and material for complete installation appropriate to all applicable conditions in accordance with the manufacturer's requirements/recommendations.

B. Primer, Adhesives, Sealants: As recommended by the membrane manufacturer.

3.00 EXECUTION

3.01 INSPECTION

A. Inspect surfaces to be waterproofed. Make sure that conditions detrimental to the proper and timely completion of this work are corrected before proceeding with installation.

3.02 PREPARATION

A. Check that areas to be waterproofed are clean and dry. Fill voids and cracks with materials compatible with membrane components, and remove ridges and fins, leaving a smooth, clean surface.

B. Check that pipes, conduits and other penetrations of waterproofing membrane have been installed before beginning work.

3.03 INSTALLATION

A. Application: In compliance with the membrane manufacturer's printed instructions and the following.

1. Where control joints are present in the concrete substrate, clean joint with compressed air to remove all foreign substances and drape the waterproofing membrane in the joint. Insert sealant backer rod continuously to hold waterproofing membrane in place; do not cement membrane in joint.

2. Trowel a thinned coating of latex-modified dry-set mortar, specified in Section 09 30 00, on concrete substrate to receive the waterproofing, so that no bare spots result, and embed the sheet waterproofing in it.

3. Roll sheet waterproofing firmly to thoroughly seat it in the mortar. Continuously weld all joints of the membrane with manufacturer's recommended solvent.

4. Turn the sheet waterproofing up walls a minimum of 1 in. behind tile bases to form a water dam. Cut waterproofing at corners and seal as recommended by its manufacturer.

5. Flash membrane into drains and seal with manufacturer's recommended sealant.

6. Comply with all manufacturer's recommendations and requirements for installation of complete waterproofing system at both floors and walls applicable to the intended application/location.

B. Protection: Protect installed membrane from damage until tile is installed.

3.04 FIELD QUALITY CONTROL

A. After completing installation of waterproofing, and just prior to installation of tile, plug drains and other outlets, dam areas that can not be otherwise partitioned, and fill the entire membrane area with water for 24 hours.

B. Repair leaks and retest the membrane until proven watertight.

END OF SECTION

SECTION 07 20 00
BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as necessary to complete the Contract, including, but not limited to, these major items:

1. Insulation below roof deck.

2. Wall insulation.

1.2 RELATED WORK SPECIFIED ELSEWHERE AS REQUIRED

A. Acoustical treatment.

B. Insulation of pipe and ducts.

C. Partition framing.

D. Roof framing.

1.3 GENERAL REQUIREMENT

A. Insulating materials, including facing such as vapor retarders and vapor permeable membranes, and similar coverings, installed under this work shall have flame spread rating not to exceed 25 and smoke density not to exceed 450 when tested in accordance with ASTM E84 or VL723, under installed conditions.

B. Thermal Performance R shall be tested per ASTM C 518.

1.4 CERTIFICATION

A. The Contractor shall certify that the insulation conforms to the requirements of the State Energy Code.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wall and Roof Insulation: ASTM C665, Type III, FRK or FSK foil faced, with flame spread - 25, smoke developed - 50; perms -0.02 maximum. Manufacturer: CertainTeed Corp., Owens-Corning, Manville or approved equal. Unless otherwise shown on the drawings, thermal values shall be R-30 where used at roofs and R-19 where used at walls.

B. Sound Insulation: Unfaced, friction fit conforming to ASTM C665 Type I. Flame spread 25. Manufacturer: CertainTeed Corp., Owens-Corning, Manville or approved equal.

C. Staples: Conform to Fed. Spec. FF-N-105, "Nails, Wire and Staples", Amendment No. 2, except the staple dimensions shall be outside dimensions. Form from galvanized steel wire having a tensile strength range of 80,000 to 110,000 psi. Galvanize coating shall be Type I. Size: 16 gauge x 3/4" crown x 7/8" leg.

PART 3 - EXECUTION

3.1 INSTALLATION - ROOF

A. Install in conformance with the manufacturers' written instructions. There shall be a one inch air space at the roof sheathing and roofing framing shall be covered with the foil tensioning flange. Insulation shall completely fill the cavity. Thermal performance as shown on the drawings.

3.2 INSTALLATION - WALLS

A. Install wall insulation between the wood or metal framing in conformance with the manufacturers' written instructions. Friction fit between the metal framing and stapled at wood framing. Insulation shall completely fill the cavity but not compressed. Thermal performance as shown on the drawings. Where concrete unit masonry walls are scheduled to be covered with gypsum drywall install in conformance with the manufacturers' written instructions.

END OF SECTION

SECTION 07 52 00
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cold Applied 2-Ply Thermoplastic Hybrid Roof System (KEE-Stone FB 60). (2.17) (3.4)

1.2 RELATED SECTIONS

1.3 REFERENCES

A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.

D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.

G. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

H. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

I. ASTM D 2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.

J. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

K. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

L. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

M. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

N. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

O. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

P. ASTM D 6754 - Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing.

Q. ASTM D 6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.

R. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

S. Factory Mutual Research (FM): Roof Assembly Classifications.

T. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

U. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

V. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

W. Warnock Hersey (WH): Fire Hazard Classifications.

X. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

Y. ASCE 7, Minimum Design Loads for Buildings and Other Structures

Z. UL - Fire Resistance Directory.

AA. FM Approvals - Roof Coverings and/or RoofNav assembly database.

BB. FBC - Florida Building Code.

CC. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).

DD. California Title 24 Energy Efficient Standards.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

C. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

D. Roof system shall have been tested in compliance with the following codes and test requirements:

1. Cool Roof Rating Council:

a. CRRC Directory CRRC

1.5 SUBMITTALS

A. Submit under provisions of Section 01 33 23 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.

2. Storage and handling requirements and recommendations.

3. Installation instructions.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation, and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.

E. Recycled or Bio-Based Materials: Provide third party certification through UL Environment of roof System membranes containing recycled or bio based materials.

F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

G. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

I. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:

1. Record minutes of the conference and provide copies to all parties present.

2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.

3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50-degree F (10-degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50-degree F (10-degree C) and below 80-degree F (27-degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed Limited Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due to defective material, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.

1. Warranty Period:

a. 30-years from date of acceptance. Requires mid period inspection.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The) which is the District Standard; 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com. Local rep Sean Gavin 661-343-3337.

B. Both steep slope and low slope roofing sections must be from the same manufacturer and covered under one umbrella. Multiple warranties from multiple manufacturers will not be accepted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 66 00 - Product Requirements.

D. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.

1. Bidder will not be allowed to change materials after the bid opening date.

2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.

3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:

a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.

b. Will provide the same guarantee for substitution as for the product and method specified.

c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.

d. Will waive all claims for additional cost related to substitution, which consequently become apparent.

e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.

f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.

4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.

5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.

2.2 COLD APPLIED 2-PLY THERMOPLASTIC HYBRID ROOF SYSTEM - KEE-Stone FB 60

A. Nailable Base Sheet: One ply fastened to the deck per wind uplift calculations.

1. VersiPly 40:

B. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:

1. FlexBase 80:

C. Thermoplastic Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive (2):

1. KEE-Stone FB 60:

D. Interply Adhesive: (1)

1. Green-Lock Plus Membrane Adhesive.

E. Flashing Base Ply: One ply bonded to the prepared substrate with Flashing Ply Adhesive:

1. FlexBase 80:

F. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Flashing Ply Adhesive:

1. KEE-Stone FB 60 Flashing.

G. Flashing Ply Adhesive (1):

1. Green-Lock Plus Flashing Adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.

1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2. Fill substrate surface voids that are greater than 1/4-inch-wide with an acceptable fill material.

3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.

4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.

5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.

6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.

7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40- 45 degrees F. When work at such temperatures unavoidable use the following precautions:

1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.

2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION COLD APPLIED ROOF SYSTEM

A. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.

1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.

2. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.

3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.

4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.

5. Extend plies 2 inches beyond top edges of cants at wall and projection bases.

6. Install base flashing ply to all perimeter and projection details.

7. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Thermoplastic Cap Ply: Allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.

1. All field seams exceeding 10 feet in length shall be welded with an approved automatic welder.

2. All field seams must be clean and dry prior to initiating any field welding. Remove foreign materials from the seams (dirt, oils, etc.) with acetone or authorized alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.

3. Contaminated areas within a membrane seam will inhibit proper welding and will require a membrane patch or strip.

4. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld. The lap or seam area of the membrane may be intermittently tack welded to hold the membrane in place.

5. The back interior edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.

6. Follow local code requirements for electric supply, grounding and surge protection. The use of a dedicated, portable generator is highly recommended to ensure a consistent electrical supply, without fluctuations that can interfere with weld consistency.

7. Properly welded seams shall utilize a 1.5-inch-wide nozzle, to create a homogeneous weld, a minimum of 1.5 inches in width.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 061000 – Rough Carpentry.

1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.

2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.

3. Nailer lengths should be spaced with a minimum 1/8-inch gap for expansion and contraction between each length or change of direction.

4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Division 7. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.

3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.

4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.

5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.

6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.

7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.

8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.

3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.

4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.

5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.

6. All stripping shall be installed prior to flashing cap sheet installation.

7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.

8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.6 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles, and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection upon completion of the Work.

1. Warranty shall be issued upon manufacturer's acceptance of the installation.

2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.

3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.

4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.8 SCHEDULES

A. Base (Ply) Sheet:

1. FlexBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.

a. Tensile Strength, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in

2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m

b. Tear Strength, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf

2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N

c. Elongation at Maximum Tensile, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%

2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%

d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34.4 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:

1. KEE-Stone FB 60: 60 mil thermoplastic, ketone ethylene ester (KEE) roofing membrane with polyester scrim. ASTM D6754

a. Breaking Strength, ASTM D 751, Proc. B, strip 1) 375 lbf. (1,668 N)

b. Tear Strength ASTM D 751 1)120 lbf. min. (534 N)

c. Elongation at Break (%), ASTM D 751, Proc. B, Strip 1) 40.0%

C. Interply Adhesive:

1. Green-Lock Plus Membrane Adhesive: Cold applied solvent free membrane adhesive: zero V.O.C. compliant performance requirements:

a. Non-Volatile Content ASTM D 4586 100%

b. Density ASTM D 1475 12.3 lbs./gal. (1.47 g/cm3)

c. Viscosity Brookfield Spindle T-E at 5 rpm 124,000 cPs.

d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)

e. Slope: up to 3:12

D. Flashing Base Ply:

1. FlexBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.

a. Tensile Strength, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in

2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m

b. Tear Strength, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf

2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N

c. Elongation at Maximum Tensile, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%

2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%

d. Low Temperature Flexibility, ASTM D 5147:

1) Passes -30 deg. F (-34.4 deg. C)

E. Flashing Ply Adhesive:

1. Green-Lock Plus Flashing Adhesive: Cold applied solvent free flashing adhesive: zero V.O.C.

a. Non-Volatile Content ASTM D 4586 100%

b. Density ASTM D 1475 11.8 lbs./gal. (1.17 g/cm3)

c. Viscosity Brookfield 400,000 cPs.

d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)

F. Surfacing:

1. Flashing Cap (Ply) Sheet:

a. KEE-Stone FB 60 Flashing: 60 mil thermoplastic, ketone ethylene ester (KEE) roofing membrane with polyester scrim. ASTM D 6754.

1) Breaking Strength, ASTM D 751, Proc. B, strip

a) 378 lbf

2) Tear Strength ASTM D 751

a) 120 lbf. minumum.

3) Elongation at Break (%), ASTM D 751, Proc. B, Strip

a) 40.0%

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.

2. Urethane joint sealants.

3. Latex joint sealants.

4. Preformed joint sealants.

1.2 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers eight samples of materials that will contact or affect joint sealants. Use ASTM C 1087 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

B. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.3 SUBMITTALS

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

B. Samples: For each kind and color of joint sealant required.

C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.

2. Joint-sealant manufacturer and product name.

3. Joint-sealant formulation.

4. Joint-sealant color.

D. Product test reports.

E. Preconstruction compatibility and adhesion test reports.

F. Preconstruction field-adhesion test reports.

G. Field-adhesion test reports.

H. Warranties.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

B. Pre-installation Conference: Conduct conference at Project site.

1.5 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

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

1. Architectural Sealants: 250 g/L.

2. Sealant Primers for Nonporous Substrates: 250 g/L.

3. Sealant Primers for Porous Substrates: 775 g/L.

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

1. Suitability for Immersion in Liquids. Where sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247. Liquid used for testing sealants is deionized water, unless otherwise indicated.

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

2.2 SILICONE JOINT SEALANTS

A. Neutral-Curing Silicone Joint Sealant: ASTM C 920.

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

    a. BASF Building Systems.

    b. Dow Corning Corporation.

    c. GE Advanced Materials - Silicones.

    d. Pecora Corporation.

    e. Polymeric Systems, Inc.

    f. Schnee-Morehead, Inc.

    g. Sika Corporation; Construction Products Division.

    h. Tremco Incorporated.

2. Type: Single component (S) or multicomponent (M).

3. Grade: Pourable (P) or nonsag (NS).

4. Class: 100/50.

5. Uses Related to Exposure: Traffic (T).

2.3 LATEX JOINT SEALANTS

A. Latex Joint Sealant [LS-<#>]: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

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

    a. BASF Building Systems.

    b. Bostik, Inc.

    c. Pecora Corporation.

    d. Schnee-Morehead, Inc.

    e. Tremco Incorporated.

2.4 JOINT SEALANT BACKING

A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.5 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.

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

PART 3 - EXECUTION

3.1 PREPARATION

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

1. Remove laitance and form-release agents from concrete.

2. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by 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 or primer 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.

3.2 INSTALLATION

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

B. Install sealant backings of kind 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.

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

D. 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.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs 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 profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

F. Acoustical Sealant Installation: Comply with ASTM C 919 and with manufacturer's written recommendations.

G. 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.

3.3 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed and cured sealant joints as follows:

a. Perform 5 tests for the first 500 feet (300 m)] of joint length for each kind of sealant and joint substrate.

b. Perform 1 test for each 1000 feet (300 m) of joint length thereafter.

2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.4 JOINT-SEALANT SCHEDULE

A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Isolation and contraction joints in cast-in-place concrete slabs.

b. Tile control and expansion joints.

c. Joints between different materials listed above.

d. Other joints as indicated.

2. Joint Sealant: Silicone.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:

a. Construction joints in cast-in-place concrete.

b. Control and expansion joints in unit masonry.

c. Joints between different materials listed above.

d. Perimeter joints between materials listed above and frames of doors, windows and louvers.

e. Control and expansion joints in ceilings and other overhead surfaces.

f. Other joints as indicated.

2. Joint Sealant: Silicone.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.

1. Joint Locations:

a. Isolation joints in cast-in-place concrete slabs.

b. Control and expansion joints in tile flooring.

c. Other joints as indicated.

2. Joint Sealant: Silicone.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors

D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Locations:

a. Control and expansion joints on exposed interior surfaces of exterior walls.

b. Perimeter joints of exterior openings where indicated.

c. Tile control and expansion joints.

d. Vertical joints on exposed surfaces of interior unit masonry, concrete, walls and partitions.

e. Perimeter joints between interior wall surfaces and frames of interior doors windows and elevator entrances.

f. Other joints as indicated.

2. Joint Sealant: Latex.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.

1. Joint Sealant Location:

a. Joints between plumbing fixtures and adjoining walls, floors, and counters.

b. Tile control and expansion joints where indicated.

c. Other joints as indicated.

2. Joint Sealant: Silicone.

3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES AND WINDOW FRAMES

PART 1 - GENERAL

1.1 WORK

A. Custom fabricated hollow steel doors, door frames and glazed light frames with accessories and anchors complying with HMMA 861 “Guide Specifications for Commercial Hollow Metal Doors and Frames.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including General and Supplementary conditions and Division 01 specification sections apply to this section.

1.3 RELATED WORK SECTIONS

A. Section 08 71 00 Finish Hardware

B. Section 08 80 00 Glass and Glazing

C. Section 09 90 00 Painting

1.4 REFERENCES SPECIFIED

A. ISO 9001 – Quality System.

B. UL 10B - Fire Tests of Door Assemblies.

C. UL 10C – Standard for Positive Pressure Fire Tests of Door Assemblies, UBC 7-2-1997 Fire Tests of Door Assemblies.

D. UL10B or NFPA 252 at Atmospheric Pressure.

E. A1008/A1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Allow and High-Strength Low-Allow with Improved Formability.

F. ASTM-A568 – General Requirements for Steel, Carbon and High Strength Low Alloy Hot Rolled Strip, and Cold Rolled Sheet.

G. ASTM-A924 -General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process.

H. ANSI A250.8/SDI-100 - Recommended Specifications for Standard Steel Doors and Frames.

I. ANSI A250.11 - Recommended Erection Instructions for Steel Frames.

J. SDI-107 - Hardware on Steel Doors (Reinforcement Application).

K. NFPA-80 - Standard for Fire Doors and Windows.

L. NFPA-101 - Life Safety Code.

M. ANSI-A250.4 and ANSI-A250.5 - Test Procedure and Acceptance Criteria for Physical Endurance, Steel Doors and Frames.

N. ANSI-A250.10 - Test Procedure and Acceptance Criteria for Painted Steel Surfaces for Steel Doors and Frames.

O. ADA-The Americans with Disabilities Act - Title III - Public Accommodations.

P. ANSI-A117.1 - American National Standards Institute - Accessible and Usable Buildings and Facilities.

Q. U. L. - Underwriter's Laboratories.

R. ITS - Intertek Testing Service [Warnock Hersey].

S. CBC - California Building Code and Local Codes Including Authority Having Jurisdiction.

T. N.F.P.A. 105 - Smoke and draft control assemblies.

U. U.L. - 1784 Air leakage test of door assemblies.

V. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under Specified Pressure Differences across the Specimen.

W (HMMA) Hollow Metal Mfr's. Assoc., a Div. of National Assoc. of Arch. Metal Mfr's. (NAAMM), Guide Spec. for Commercial Hollow Metal Doors & Frames, HMMA Standard #861-87; NFPA #80

1.5 SUBMITTALS

A. Shop Drawings: Indicate door and frame elevations and sections, materials, gauges, fire ratings, finishes, fabrication and erection details, location and extent of hardware reinforcement, type and location of frame anchors, locations of finish hardware by dimension and locations/details of all openings and louvers. Do not proceed with any fabrication until all details are approved.

1. Show all frame sections, anchorage of frames in openings, preparation for hardware, metal gauges, field splice joints, and other data.

2. Doors: Show all construction; gauges, preparation for hardware, door lining materials, openings for louvers and glazing, and other data.

3. Coordinate with Contractor and typically indicate acceptable tolerances to be incorporated into frame throat to allow for finish materials installation.

4. Show elevations of each hollow metal door and window type, details of each frame type, location schedule using same reference numbers as contract drawings, details of installation in the various openings, wall thicknesses and materials to be encountered in this Project, installation requirements for hardware, and typical and special details of construction, including relationships to adjacent construction and materials.

B. Certification of Compliance: Submit any information necessary to indicate compliance to these specifications. Finished work and shop drawings shall match approved samples.

C. Submit samples prior to submission of shop drawings or beginning any fabrication.

1. Samples will be retained until Project is completed.

2. Door Construction: Provide cut-away sample showing edge, top, and bottom construction; insulation; hinge, closer, lock, and panic bar reinforcement; face stiffening.

3. Frame Construction: Provide sample of typical profile, with welded corner joint, hinge and closer reinforcement, mortar guards, wall anchor, and floor anchor, in full compliance with these Project specifications. For exterior openings to receive glazing, provide additional sample of typical profile with glazing stops and ALL joints/seams filled and sealed watertight.

D. Job Closeout: Provide two (two) complete manufacturer's catalogs to the building owner's designated representative.

1.6 QUALITY ASSURANCE

A. Source Quality Control: Products to be certified by manufacturer showing compliance with these specifications; specifically describe and certify complete hot-dipped galvanizing and shop prime painting of all hollow metal doors and frames at exterior openings. Certification must be submitted with shop drawings and with each product upon delivery. No doors or frames shall be delivered to job site, installed, or accepted without this certification.

B. All hollow metal doors and frames shall be the product of one (1) manufacturer. Exceptions will not be permitted under any circumstances.

C. Requirements of Regulatory Agencies: Conform to Title 24 CBC and NFPA #80 for fire-rated assemblies.

D. Certification of A-60 galvanizing and prime paint finishing.

E. Certification that the Polystyrene Core Swinging Type Fire Doors – Model 707 as manufactured by The Curries Company, has been investigated by Underwriters Laboratories and certified for Standard(s) of Safety: UL 10C – Standard for Positive Pressure Fire Tests of Door Assemblies, UBC 7-2-1997, Fire Tests of Door Assemblies.

F. Hollow metal manufacture shall be a SDI member.

G. The Hollow Metal Manufacturer shall supply doors and frames through a national distribution system as described in 1.06.D herein. Marketing material through a factory direct method will not be acceptable to the building owner.

1. Successful distributor shall be located within the project area.

H. Hollow metal supplier shall be a qualified “local direct distributor” of products to be furnished. The distributor shall have in their regular employment an AHC and/or CDC with a local business address, telephone and fax line, which will be available at reasonable time’s through-out the project, to consult with the architect, contractor and building owner regarding matters affecting the door and frame openings.

I. Contractor will allow in his bid for the replacement of two exterior (2) doors selected at random by the project architect and owner’s representative for dismantling and inspection of internal construction and compliance with the specification. Contractor to provide labor and tools for inspection under architect's direction.

J. Failure of any hollow metal frame or door to meet specified standards shall be grounds to reject the entire shipment of hollow metal doors and frames, including the hollow metal manufacturer. Components shall be replaced at contractor’s expense, including two additional doors for dismantling. No extensions of time or additions to the contract will be allowed due to a rejection of material and substitution of the hollow metal manufacturer.

L. Installer requirement: Firm with a minimum of five years’ experience in the installation of metal doors and frames similar in the type included in this specification and have a meeting with lock representative for proper installation of said locks.

M. A pre-construction meeting is required for proper installation of said lock.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver doors and frames cardboard wrapped, crated, palletized or otherwise protected during transit and site storage.

B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and accepted by the architect. Otherwise remove and replace damaged items.

C. Store doors and frames at the building site in a dry, secure place.

1. Place units on minimum 4-inch high wood blocking.

2. Avoid non-vented shelters [covering] that can create a humidity chamber.

3. If cardboard wrapper on door becomes wet, remove carton immediately.

4. Provide 1/4-inch spaces between stacked doors to promote air circulation.

1.8 SEQUENCING AND SCHEDULING

A. Sequencing, Scheduling: Verify all existing conditions, opening sizes, finishes, frame throat dimensions, existing conditions to remain, hardware, glazing, and doors with respective Sections.

B. Deliver all doors and frames to the job site in a timely manner so as not to delay progress of other trades.

C. Issue purchase orders to frame, door and hardware suppliers in sufficient time so as not to interfere with normal quoted delivery of materials.

1.9 WARRANTY

A. Hollow metal doors and frames shall be supplied with a two (2) year warranty against defects in materials and workmanship.

B. Warranty to commence with substantial completion of the job.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Or Equal, provided products meet the specified performance and construction requirements, and are acceptable to the building owner. Such products are subject to California Public Contracts Code Section 3400.

B. Performance criteria as specified in 2.03 will be supported by an independent laboratory cycle and twist test certification document, and will be included in the supplier's shop submittals. The building owner's authorized representative including locksmith and project supervisor will review any proposed substitution. Request will be required ten (10) days before bid. Request will require a complete sample of product with supporting data. In addition, the architect and owner will be furnished a list of a minimum of twenty (20) local (75-mile radius of client) institutional end-user customers with facilities locksmith names and telephone numbers.

D. Manufacturers:

1. Curries, Division of AADG, Inc.

2. Krieger

3. Stiles

2.2 MATERIALS

A. Steel requirements, all doors and frames to be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel per ASTM-A1008 and A-568 general requirements or galv. to A60 minimum coating weight standard per ASTM-A924 or A653 hot dip galvanized to A60 minimum coating weight standard. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM-A1011.

1. Typical, For Frames at Interior Openings: ASTM A-366; Prime quality, cold rolled, pickled and annealed, free from scale pitting and surface defects.

2. Typical, For Exterior Doors and Frames at Exterior Openings: ASTM A525 and ASTM A526; Prime quality, cold rolled, zinc coated (fully galvanized) by the hot dip process,

3. Coating Materials Primer: all doors and frames to be bonderized and finished as standard with manufacturer's baked-on primer conforming to ANSI-A250.10, or galvanized conforming to Commercial Quality A-60 or G-90 (1.25 oz/sq. ft.), free from scale pitting and surface defects. Use stretcher leveled sheets for doors and panels.

B. Door Core

1. Polystyrene core. All doors to have:

a. Fiberglass: Semi-rigid compressed fiberglass board, 6 pcf density, R = 4.55/inch.

b. Fire-Rated Doors: As required to provide required ratings.

c. Permanently bonded to the inside of each face sheet providing rigidity, insulating and sound deadening properties to the door.

d. Refer to 2.03 for additional specification.

e. Steel ribbed core doors are unacceptable and will be rejected and

f. replaced at the contractor’s expense.

2. Temperature rise rated doors should be provided for stairwell enclosures, which indicate “Temperature rise 30 minutes - 450 degrees F maximum or 250 degrees F maximum” as required by the local building code.

C. Glass lite frames in doors fabricated of not less than 18 GA. galvanized steel with attachment screws allowed only on the non-secure side, screws not visible when viewing door lite frame face.

1. Metal Moldings/Frames and Stops For Glass Lites In Hollow Metal Doors: Provided by door mfr., fixed moldings integral with interior side of door; glass channels fully continuously welded watertight; loose stops min. 18 ga. for exterior side of door, tightly butted corner joints. At fire-rated doors, provide fire-rated stops.

a. Glazing Stops For Glass Lites & Porcelain Enamel Panels in Frames:

i. Typical: #20 ga., 5/8" deep typical; unless noted otherwise.

ii. All Exterior Stops: Galvanized A-60 or G-90.

iii. Stops For Fire-Rated Glass: #16 ga. min., 3/4” deep typical (5/8" min.); verify with glass mfr. for the particular fire rating.

D. Security Metal Louvers For Hollow Metal Doors: "Anemostat" Type PLSL, fixed inverted split-Y, #18 ga. steel louvers, #12 ga. frame, #12 ga. security grille face plates with 13/16" sq. perforations, security thru-bolt fasteners, baked prime coat finish, with integral insect screen at exterior locations.

E. Fastenings: As required; FHSM vandalproof / tamper-resistant screws for glazing stops. Use stainless steel type screws at exterior doors.

F. Electric Through Wire [HMD]

1. Provide all hollow metal doors receiving electrified hardware with electrical through-door wiring harness and concealed plug connectors on each end to accommodate up to twelve wires.

2. Coordinate connectors on each end of the wiring harness to plug directly into the electrified hardware and the electric hinge.

G. Electric Through Wire [HMF]

1. Provide all hollow metal frames receiving electrified hardware with Electrical wiring harness and concealed plug connectors to accommodate up to twelve wires.

2. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the electric hinge.

2.3 FABRICATION

A. General

1. Fabricate all doors and frames in accordance with ANSI A250.8-1998/SDI-100 except where requirements that are more stringent are specified.

2. As detailed on plans, fabricated "welded" frame units to be delivered to job site as single units. Transoms, sidelights, and window walls, which are "oversize" for transportation and installation, shall be furnished with field splices to be field assembled by the general contractor.

3. Supply only doors and frames manufactured by the acceptable manufacturer listed in this specification.

4. Doors to be 707 Series as manufactured by the Curries Co, Mason City, IA.

   727 Series at Temperature rise rated doors, which indicate “Temperature rise 30 min. 450F degrees maximum or 250F degrees maximum” as required by local building code.

5. Prepare doors to receive door hardware per approved schedule, including internal reinforcing. Do not include unnecessary cutouts in door faces not required by hardware template.

B. Door Construction

1. Classification: SDI Level 3 - Model 2 (16GA.) at all interior and exterior drs.

2. Face sheets formed of cold rolled steel.

3. Exterior doors to be galvanized to A60 minimum weight standard.

4. Seamless construction by continuous wire weld of both edges full height of door, and to be performed at the factory.

5. Lite and louver door cutouts: Furnish perimeter channel reinforcement and seal watertight by supplier.

6. Lock edges beveled 1/8 inch in 2 inches.

7. Door lock edge reinforcing shall be one-piece, full height 14GA. Channel. Door hinge edge reinforcing shall be one-piece, full height 12GA. Channel formed and tapped for hinges or as required per listed hardware.

8. Both hinge and lock channels to be welded to each face sheet of the door.

9. Top and bottom channels:

   a. Not less than 16GA. - flush or inverted.

   b. Welded to the face sheet.

   c. Close tops of exterior doors flush by the addition of 16GA. Galvanized steel channel fillers. Channel filler to sealed watertight.

10. Astragals: To be flat security type or 'Z' as called for in the specifications.

11. All doors to conform to A.N.S.I.-A 250.4 Test Procedure and Acceptance Criteria for Physical Endurance. Door size cycle tested to be 4070 to min. Level A performance. Furthermore, doors will have been subjected to an additional one (1) million cycle and twist tests with a combined two (2) million cycles and 46 twist tests. Testing to be accomplished by an independent lab. Certification of these criteria to be submitted with approval drawing by the HM distributor.

12. Transom Panels: To be constructed similar to doors.

13. Where indicated, provide insert type louvers in bottom of doors. Louvers to be not less than 18 GA. prime coated steel.

14. Minimum HG/FG stiles shall be six (6) inches wide. Top rail shall be a minimum eight (8) inches.

C. Door and Window Frame Construction

1. Frames shall comply with ANSI/SDI A250.5 Level A, one-million cycle swing test performance for a 4070 door frame.

2. All frames to be formed from cold rolled steel. Furnish 14GA. door and window frames at exterior openings and 16GA. at interior. Exterior door and window frames to be galvanized to A60 minimum weight standard.

3. All frames are to be Full Profile welded, ground smooth, and re-primed at the welded area.

4. Window frame glass stops shall be minimum 18GA.steel and 5/8" in height.

   a. Exterior stops and countersunk flat-head attachment screws to be galvanized.

   b. Typical, unless noted or detailed otherwise: Integral stop at interior face; loose (removable) stops at exterior face, for field assembly with countersunk removable vandalproof screws at 16" o.c. typical.

   c. Removable Stops: #20 ga., 58" x 5/8" typical, unless noted otherwise. Finish to match steel frames, A-60 hot-dipped galvanize

at all exterior openings.

d. All exposed screws to be non-magnetic stainless steel; finish to match steel frames.

5. Provide temporary shipping bars to help protect from damage during transit and handling.

a. Temporary shipping bars to be removed before setting frames.

6. All welds on frames, transoms and side-lites to be flush with neatly mitered or butted material cuts.

D. Frame Anchors: Provide sufficient anchorage to attach to wall in accordance with ANSI/SDI A250.5-‘94 Test Compliance Level A of one million cycles, or anchorage as detailed on plans to specific wall conditions.

1. Wall anchor for frame attachment to masonry construction: Masonry anchors, adjustable, flat, corrugated or perforated 'T' shaped anchors with leg not less than 2 inches wide by 10 inches long or masonry "wire" type not less than 3/16” diameter.

2. All frame jamb anchors to be provided: one each jamb per 24 inches of frame height or fraction thereof (minimum 3 in masonry or concrete and 4 in stud construction). Furnish a minimum of two head anchors for frames installed in stud walls and three or more anchors in frame width exceeding 42”.

3. Floor anchors - angle clip type:

a. Minimum 14 GA.

b. To receive two (2) fasteners per jamb.

c. Welded to the bottom of each jamb.

4. In place masonry or concrete:

a. 3/8 inch countersunk flat head stove bolt and expansion shields.

b. Spaced 6 inches from top and bottom of frame and at 26 inches on center maximum between.

c. Weld pipe spacers or other type of spacers per manufacturer’s standard design in back of frame soffit to protect frame profile during tightening of bolts and anchors.

5. 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 called for on schedule.

E. Hardware Preparation [NOTE: Utility door prep is not acceptable]

1. Reinforcements: reinforce components for hardware installation in accord with ANSI-A115. Provide minimum gage hardware channel type reinforcing for mortise or surface applied hardware as follows:

Hinge	- 7 GA. on frames for mortise butt hinges (min 1-1/4”x10”).
Cont Hinge	- 12 GA. full length on frames for continuous hinges.
Lock	- 12 GA. or equivalent number of threads.
Panic Devices	- 14 GA.
Surface Closer	- 12 GA.
Hold Open Arm	- 12 GA.
Other Items	- Conform to HMMA Standards

2. Field drilling and/or tapping for surface applied hardware is installation contractor’s responsibility.

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

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

5. Grout solid all frames in masonry or concrete walls. Provide steel plaster-guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings. Protect inside throat of each frame in grout filled wall conditions or where antifreeze additives are used in fill, with a waterproof undercoating material minimum 1/8” thick, field applied by installer.

F. Drips:

1. Location: Provide at all locations where indicated and at all new or replacement exterior door frames where there is no above-the-door overhang which projects beyond a line drawn upward at 45 degrees from the door head.

2. Construction: 14 ga; Steel material same as door frame; tack weld to top of door frame embedded in wall; seal watertight.

G. Water Penetration: Borrowed lite assemblies, transom, sidelite, and combination transom sidelite frames are not factory sealed to prevent water penetration. In situations where water penetration is a concern, contractor must seal with a high quality long lasting sealant, all joints that are exposed to the elements after the frame assembly is installed. Whenever possible, it is recommended that glass and glazing be installed on the exterior rabbet of the frame assembly. This will help act as a deterrent to water penetration.

1. The member companies of the hollow metal industry cannot control the workmanship associated with the frame installation; therefore, it is the responsibility of the installer to assure all steps are taken to prevent water penetration.

H. Excess Material

1. Contractor to deliver any unused doors and frames to the building owner's designated representative.

PART 3 - EXECUTION

3.1 FRAME INSTALLATION

A. Erection Installation: Install hollow metal units in accordance with manufacturer's instructions and final shop drawings. Fit doors to frames and floors with proper clearances and to achieve the maximum operational effectiveness and appearance of each unit. SDI 122-99 "Installation and Trouble Shooting Guide for Standard Steel Doors and Frames" or "The Installation of Commercial Steel Doors and Steel Frames" as published by DHI are recommended guidelines.

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

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

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

E. Install frames in prepared openings in concrete and masonry walls using countersunk bolts and expansion anchors.

F. Install all fire rated frames in accord with requirements of N.F.P.A.-80.

G. Where frames require ceiling struts or other structural overhead bracing, they shall be anchored securely to structure above, as required.

H. Frames shall be filled solid with Portland cement grout where shown or required b by class of opening in masonry or concrete walls. Provide steel plaster guards or mortar boxes, welded to frame, at back of hardware cutouts where installed in concrete, masonry or plaster openings. Protect inside throat of each frame in grout filled wall conditions or where antifreeze additives are used in fill, with a waterproof undercoating type material minimum 1-2 mils thick and field applied by installer.

3.2 DOOR INSTALLATION

A. Install hollow metal doors in frames using hardware specified in Section 08 71 00 Finish Hardware. Doors are to be expertly hung and shall fit snug against all stops. Doors shall fit accurately and hang free from hinge bind with a uniform clearance of 1/8 inch at head and jambs. After hanging, make all adjustments and then remove respective hardware for finish painting. Reinstall hardware after finish painting.

B. Maximum clearances at edge of doors:

1. Between door and frame at head and jambs: 1/8 inch.
2. At meeting edges pairs of doors and at mullions: 1/8 inch.
3. At transom panels, without transom bars: 1/8 inch.
4. At sills without thresholds: 5/8 inch max above finish floor.
5. At sills with thresholds: 1/8 inch above threshold.

C. Hardware Installation: To be installed securely without marking or defacing hardware or finish work. Protect finish hardware with suitable protective covering until completion of building. Hardware to be in perfect working order. Clean and polish.

3.3 ADJUSTMENT AND CLEANING

A. Remove dirt and excess sealant, mortar or glazing compounds from exposed surfaces.

B. Adjust for smooth operation as required. Install shims as required to allow for proper closing.

C. Fill all dents, holes, etc. with metal filler and sand smooth and flush with adjacent surfaces - reprime/paint to match finish.

3.4 FINISH; FRAMES & DOORS

A Cleaning: After assembly, clean thoroughly, removing all rust, scale, grease, oil, rough spots. Use Hand Tool Cleaning (SSPC-SP2) or Power Tool Cleaning (SSPC-SP3) as applicable.

D. Touch-Up Coating of Galvanized Work: After assembly, prior to prime painting, clean and coat all abraded or damaged galvanizing coating with cold galvanizing compound, 3 mils minimum thickness, per mfr's. requirements to achieve a finish equal to min. A-60 hot-dipped galvanizing.

E. Prime Painting: After surfaces are clean, phosphatize and prime with one coat of specified rust inhibitive primer, baked on, 1.5 mils dry film thickness minimum.

3.5 ADJUSTMENT

A. Straighten, repair, and/or replace damaged work.

B. Repair any damaged or abraded areas of prime coat.

C. Repair any sealant leaks watertight.

END OF SECTION

SECTION 08 14 16
FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.

2. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Sections:

1. Division 08 80 00 Section "Glass and Glazing" for glass view panels in flush wood doors.

1.2 SUBMITTALS

A. Product Data: For each type of door indicated.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.

2. Indicate dimensions and locations of cutouts.

3. Indicate requirements for veneer matching.

4. Indicate doors to be factory finished and finish requirements.

5. Indicate fire-protection ratings for fire-rated doors.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body.

B. Quality Standard: In addition to requirements specified, comply with WIC's "Manual of Millwork".

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252 or UL 10B.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Ampco, Inc.
2. Buell Door Company Inc.
3. Eagle Plywood & Door Manufacturing, Inc.
4. Eggers Industries.
5. Graham; an Assa Abloy Group company.
6. Haley Brothers, Inc.
7. Ipik Door Company.
8. Lambton Doors.
9. Marlite.
10. Marshfield Door Systems, Inc.
11. Mohawk Flush Doors, Inc.; a Masonite company.
12. Oshkosh Architectural Door Company.
13. Poncraft Door Company.
14. Vancouver Door Company.
15. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

A. Low-Emitting Materials: Provide doors made with adhesives and composite wood products that do not contain urea formaldehyde.

B. WDMA I.S.1-A Performance Grade:

1. Extra Heavy Duty.

C. Structural-Composite-Lumber-Core Doors:

1. Structural Composite Lumber: WDMA I.S.10.

a. Screw Withdrawal, Face: 700 lbf (3100 N).

b. Screw Withdrawal, Edge: 400 lbf (1780 N).

D. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.

1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

2. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Comply with specified requirements for exposed edges.

2.3 DOORS FOR OPAQUE FINISH

A. Interior Solid-Core Doors:

1. Grade: Custom.

2. Faces: Any closed-grain hardwood of mill option.

3. Core: Structural composite lumber.

4. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.

2.4 FABRICATION

A. Openings: Cut and trim openings through doors in factory.

1. Light Openings: Trim openings with moldings of material and profile indicated.

2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 8 Section "Glazing."

2.5 SHOP PRIMING

A. Doors for Opaque Finish: Shop prime doors with one coat of wood primer specified in Division 9 Section "Interior Painting". Seal all four edges, edges of cutouts, and mortises with primer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hardware: For installation, see Division 8 Section "Door Hardware".

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.

    a. Comply with NFPA 80 for fire-rated doors.

END OF SECTION

SECTION 08 31 13
ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes access doors and frames for walls and ceilings.

1.2 SUBMITTALS

A. Product Data: For each type of access door and frame indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each door face material in specified finish.

D. Schedule: Types, locations, sizes, latching or locking provisions, and other data pertinent to installation.

1.3 QUALITY ASSURANCE

A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to assemblies tested for fire-test-response characteristics per the following test method and that are listed and labeled by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. NFPA 252for vertical access doors and frames.

2. ASTM E 119 for horizontal access doors and frames.

1.4 COORDINATION

A. If retaining this Article, also retain "Schedule" Paragraph in "Submittals" Article.

B. Verification: Determine specific locations and sizes for access doors needed to gain access to concealed plumbing, mechanical, or other concealed work, and indicate in the schedule specified in "Submittals" Article.

PART 2 - PRODUCTS

2.1 STEEL MATERIALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

1. ASTM A 123/A 123M, for galvanizing steel and iron products.

2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

B. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

1. ASTM A 123/A 123M, for galvanizing steel and iron products.

2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.

C. Steel Sheet: Electrolytic zinc-coated, ASTM A 591/A 591M with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.

D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS) with A60 (ZF180) zinc-iron-alloy (galvannealed) coating or G60 (Z180) mill-phosphatized zinc coating.

E. Steel Finishes: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Factory-Primed Finish: Manufacturer's standard shop primer.

2. Baked-Enamel Finish: Minimum dry film thickness of 2 mils (0.05 mm).

3. Powder-Coat Finish: Thickness not less than 1.5 mils (0.04 mm).

F. Drywall Beads: 0.0299-inch (0.76-mm) zinc-coated steel sheet to receive joint compound.

G. Plaster Beads: 0.0299-inch (0.76-mm) zinc-coated steel sheet with flange of expanded metal lath.

H. Manufacturer's standard finish.

2.2 ALUMINUM MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6, mill finish.

B. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6, mill finish.

C. Aluminum Sheet: ASTM B 209 (ASTM B 209M).

1. Mill finish.

2. Anodic Finish: Class II, clear anodic coating complying with AAMA 611 Class I, clear anodic coating complying with AAMA 61].

3. Baked-Enamel Finish: Manufacturer's standard.

2.3 ACCESS DOORS AND FRAMES FOR WALLS AND CEILINGS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Acudor Products, Inc.
2. Babcock-Davis; A Cierra Products Co.
3. Bar-Co, Inc. Div.; Alfab, Inc.
4. Cendrex Inc.
5. Dur-Red Products.
6. Elmdor/Stoneman; Div. of Acorn Engineering Co.
7. Jensen Industries.
8. J. L. Industries, Inc.
9. Karp Associates, Inc.
10. Larsen's Manufacturing Company.
11. MIFAB, Inc.
12. Milcor Inc.
13. Nystrom, Inc.
14. Williams Bros. Corporation of America (The).

B. Flush Access Doors and Frames with Exposed Trim: Fabricated from steel sheet.

1. Locations: Wall and ceiling
2. Door: Minimum 0.060-inch- (1.5-mm-) thick sheet metal.
3. Frame: Minimum 0.060-inch- (1.5-mm-) thick sheet metal with 1-1/4-inch- (32-mm-) wide, surface-mounted trim.
4. Hinges: Continuous piano.
5. Latch: Cam latch with interior release.
6. Lock: Mortise cylinder.
    a. Lock Preparation: Division 08 Section "Door Hardware".

C. Fire-Rated, Insulated, Flush Access Doors and Frames with Exposed Trim: Fabricated from steel sheet.

1. Locations: Wall and ceiling surfaces.

2. Fire-Resistance Rating: Not less than that of adjacent construction.

3. Temperature Rise Rating: 250 deg F (139 deg C) at the end of 30 minutes.

4. Door: Flush panel with a core of mineral-fiber insulation enclosed in sheet metal with a minimum thickness of 0.036 inch (0.9 mm).

5. Frame: Minimum 0.060-inch- (1.5-mm-) thick sheet metal with 1-inch- (25-mm-) wide, surface-mounted trim.

6. Hinges: Continuous piano.

7. Automatic Closer: Spring type.

8. Latch: Self-latching device operated by flush key with interior release.

9. Lock: Self-latching device with mortise cylinder lock.

a. Lock Preparation: Division 08 Section "Door Hardware".

2.4 FABRICATION

A. General: Provide access door and frame assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view, provide materials with smooth, flat surfaces without blemishes.

C. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

D. Recessed Access Doors: Form face of panel to provide recess for application of applied finish. Reinforce panel as required to prevent buckling.

E. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

1. For cylinder lock, furnish two keys per lock and key all locks alike.

F. Extruded Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

C. Install doors flush with adjacent finish surfaces or recessed to receive finish material.

3.2 ADJUSTING AND CLEANING

A. Adjust doors and hardware after installation for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Door hardware.

2. Cylinders for doors fabricated with locking hardware.

B. Related Divisions:

1. Division 06 – door hardware installation

2. Division 07 – Section “Joint Sealants” for sealant requirements applicable to threshold installation specified in this section.

3. Division 08 – metal doors and frames.

4. Division 09 – sections for touchup finishing or refinishing of existing openings modified by this section

C. Specific Omissions: Hardware for the following is specified or indicated elsewhere.

1. Windows.

2. Cabinets, including open wall shelving and locks.

3. Signs.

4. Toilet accessories, including grab bars.

5. Installation.

6. Rough hardware.

7. Access doors and panels.

1.2 REFERENCES**:**

A. Use date of standard in effect as of Bid date.

1. American National Standards Institute

a) ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties.

2. BHMA – Builders Hardware Manufacturers Association
3. 2022 California Building Code.

    a) Chapter 11B – Accessibility To Public Buildings, Public Accommodations, Commercial Buildings and Public Housing.

4. DHI – Door and Hardware Institute.

5. UL – Underwriters Laboratories

    a) UL 305 – Panic Hardware

6. WHI – Warnock Hersey Incorporated State of California Building Code

7. Local applicable codes

8. SDI – Steel Door Institute

9. NAAMM – National Association of Architectural Metal Manufacturers

B. Abbreviations

1. Manufacturers**:** see table at 2.1.A of this section.

2. Finishes**:** see 2.7 of this section.

1.2 SUBMITTALS & SUBSTITUTIONS

A. SUBMITTALS**:** Submit electronic copy of schedule. 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. Minimum 10pt font size. Include following information**:**

1. Type, style, function, size, quantity, and finish of hardware items.

2. Use BHMA Finish codes per ANSI 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. Manufacturer's technical data and installation instructions for electronic hardware.

12. Date of jobsite visit.

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. 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, riser and point-to-point wiring diagrams, manufacturers' installation, adjustment and maintenance information, and supplier's final inspection report.

1.4 QUALITY ASSURANCE**:**

A. Qualifications**:**

1. Hardware supplier**:** direct factory contract supplier who employs a hardware consultant, 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. Fire-Rated Openings**:** NFPA 80 compliant. Hardware UL10C (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.

E. Furnish hardware items required to complete the work in accordance with specified performance level and design intent, complying with manufacturers' instructions and code requirements.

1.5 DELIVERY, STORAGE AND HANDLING**:**

A. Delivery**:** coordinate delivery to appropriate locations (shop or field).

1. Permanent keys and cores**:** secured delivery direct to Owner's representative.

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.

1.6 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. Note: Careful coordination required for reinforcement/blocking for wall stop support. If random inspection yields an unsupported wall stop, all locations will be rebuilt at no expense to the Owner or Architect.

3. Location of finish floor materials and floor-mounted hardware.

4. At masonry construction, coordinate with the anchoring and hollow metal supplier prior to frame installation by placing a strip of insulation, wood, or foam, on the back of the hollow metal frame behind the rabbet section for continuous hinges, as well as at rim panic hardware strike locations, silencers, coordinators, and door closer arm locations. When the frame is grouted in place, the backing will allow drilling and tapping without dulling or breaking the installer's bits.

5. Coordinate: flush top rails of doors at out swinging exteriors, and throughout where adhesive-mounted seals occur.

6. Manufacturers' 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. Environmental considerations**:** segregate unused recyclable paper and paper product packaging, uninstalled metals, and plastics, and have these sent to a recycling center.

E. 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.

F. Submittals prepared without thorough jobsite visit by qualified hardware expert will be rejected as non-compliant.

1.7 WARRANTY**:**

A. Part of respective manufacturers' regular terms of sale. Provide manufacturers' written warranties.

B. Include factory order numbers with close-out documents to validate warranty information, required for Owner in making future warranty claims:

C. Minimum warranties:

1.	Locksets**:**	Ten years
2.	Exit Devices**:**	Ten years mechanical
3.	Closers**:**	Thirty years mechanical
4.	Hinges**:**	One year
5.	Other Hardware	Two years

1.8 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.

1.9 REGULATORY REQUIREMENTS**:**

A. Locate latching hardware between 34 inches to 44 inches above the finished floor, per 2022 California Building Code, Section 11B-404.2.7.

1. Panic hardware: locate between 36 inches to 44 inches above the finished floor.

B. Handles, pull, latches, locks, other operable parts**:**

1. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate. 2022 California Building Code Section 11B-309.4.

2. Force required to activate the operable parts: 5.0 pounds maximum, per 2022 California Building Code Section 11B-309.4.

C. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2022 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.

1. Exception: exterior doors' pressure-to-open may be increased to 8.5-pounds if: at a single location, and one of a bank of eight leafs or fraction of eight, and one leaf of this bank is fitted with a low- or high-energy operator.

D. Adjust door closer sweep periods so that from an open position of 90 degrees, the door will take at least 5 seconds to move to a point 12 degrees from the latch, measured to the landing side of the door, per 2022 California Building Code Section 11B-404.2.8.

E. Smooth surfaces at bottom 10 inches of push sides of doors, facilitating push-open with wheelchair footrests, per 2022 California Building Code Section 11B-404.2.10.

1. Applied kickplates and armor plates: bevel the left and right edges; free of sharp or abrasive edges. Cavities created by kickplates to be capped per 2022 California Building Code Section 11B-404.2.10.

2. Tempered glass doors without stiles: bottom rail may be less than 10 inches if top leading edge is tapered 60 degrees minimum.

F. Door opening clear width no less than 32 inches, measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30 inches and below 80 inches, and the hardware projects no more than 4 inches. 2022 California Building Code Section 11B-404.2.3.

1. Exception: In alterations, a projection of 5/8 inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.

2. Door closers and overhead stops: not less than 78 inches above the finished floor or ground, per 2022 California Building Code 11B-307.4.

G. Thresholds**:** floor or landing no more than 0.50 inches below the top of the threshold of the doorway, per 2022 California Building Code Section 11B-404.2.5. Vertical rise no more than 0.25 inches, change in level between 0.25 inches and 0.50 inches**:** beveled to slope no greater than 1**:**2 (50 percent slope). 2022 California Building Code Section 11B-303.2 & ~.3.

H. Floor stops**:** Do not locate in path of travel. Locate no more than 4 inches from walls, per DSA Policy #99-08 (Access).

I. Pairs of doors with independently activated hardware both leafs**:** limit swing of right-hand or right-hand-reverse leaf to 90 degrees to protect persons reading wall-mounted tactile signage, per 2022 California Building Code Section 11B-703.4.2.

PART 2 PRODUCTS

2.1 MANUFACTURERS**:**

A. Listed acceptable alternate manufacturers**:** these will be considered; submit for review products with equivalent function and features of scheduled products.

ITEM**:**	MANUFACTURER**:**	ACCEPTABLE ALTERNATE**:**
Hinges	(IVE) Ives	Owner standard
Key System	(SCH) Schlage	Owner standard
Mechanical Locks	(SCH) Schlage	Owner standard
Exit Devices	(VON) Von Duprin	Owner standard
Closers	(LCN) LCN	Owner standard
Push & Pull Plates	(IVE) Ives	Owner standard
Kickplates	(IVE) Ives	Owner standard
Stops & Holders	(IVE) Ives	Owner standard
Thresholds	(ZER) Zero	Owner standard
Seals & Bottoms	(ZER) Zero	Owner standard

2.2 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 approved bearings. Hinge open widths minimum, but of sufficient throw to permit maximum door swing.

1. Out-swinging exterior doors: non-ferrous with non-removable (NRP) pins and security studs.

2. Non-ferrous material exteriors and at doors subject to corrosive atmospheric conditions.

2.3 LOCKSETS, LATCHSETS, DEADBOLTS:

A. Mortise Locksets and Latchsets: as scheduled.

1. Chassis: cold-rolled steel, handing field-changeable without disassembly.

2. Universal lock case – 10 functions in one case.

3. Floating mounting tabs automatically adjusts to fit a beveled door edge.

4. Latchbolts: 0.75 inch throw stainless steel anti-friction type.

5. 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) Levers rotate up or down for ease of use.

d) Vandalgard locks: locked lever freely rotates down while remaining securely locked. This feature prevents damage to internal lock components when subjected to excessive force.

6. Furnish solid cylinder collars with wave springs. Wall of collar to cover rim of mortise cylinder.
7. Turnpieces**:** accessible offset turn-lever design not requiring pinching or twisting motions to operate.

8. Strikes**:** 16 gage curved steel, bronze or brass with 1-inch-deep box construction, lips of sufficient length to clear trim and protect clothing.

9. Scheduled Lock Series and Design**:** Schlage L series, 06N design.

10. Certifications**:**

    a) ANSI A156.13, 1994, Grade 1 Operational.

    b) ANSI/ASTM F476-84 Grade 31 UL Listed.

11. Accessibility: Require not more than 5 lb to retract the latchbolt or deadbolt, or both, per CBC 2022 11B-404.2.7 and 11B-309.4.

12. Accepted substitutions**:** None.

2.4 EXIT DEVICES / PANIC HARDWARE

A. General features**:**

1. Independent lab-tested 1,000,000 cycles.

2. 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.

3. Deadlocking latchbolts, 0.75-inch projection.

4. End caps**:** impact-resistant, flush-mounted. No raised edges or lips to catch carts or other equipment.

5. No exposed screws to show through glass doors.

6. Non-handed basic device design with center case interchangeable with all functions, no extra parts required to effect change of function.

7. Accessibility: Require not more than 5 lb. to retract the latchbolt, per CBC 2022 11B-404.2.7 and 11B-309.4.

    a) Mechanical method: Von Duprin “AX - feature”, where touchpad directly retracts the latchbolt with 5 lb. or less of force. Provide testing lab certification confirming that the mechanical device is independent third-party tested to meet this 5 lb. requirement.

B. Specific features**:**

1. Non-Fire Rated Devices**:** cylinder dogging with security indicator.

2. Lever Trim**:** breakaway type, forged brass or bronze escutcheon min. 0.130-inch thickness, compression spring drive, match lockset lever design.

3. Accepted substitutions**:** None.

2.5 CLOSERS

A. Surface Closers**:** 4011/4111

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. ISO 2000 certified. Units stamped with date-of-manufacture code.

3. Independent lab-tested 10,000,000 cycles.

4. Non-sized and adjustable. Place closers inside building, stairs and rooms.

5. Plates, brackets, and special templating when needed for interface with particular header, door and wall conditions and neighboring hardware.

6. Advanced Variable Backcheck (AVB)**:** where scheduled, these units commence backcheck at approximately 45 degrees.

7. Adjust doors to open with not more than 5.0-pounds pressure to open at exterior doors and 5.0-pounds at interior doors. As allowed per 2022 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15-pounds.

   a) Exception: exterior doors' pressure-to-open may be increased to 8.5-pounds if: at a single location, and one of a bank of eight leafs or fraction of eight, and one leaf of this bank is fitted with a low- or high-energy operator.

8. Separate adjusting valves for closing speed, latching speed and backcheck, fourth valve for delayed action where scheduled.

9. Extra-duty arms (EDA) at exterior doors scheduled with parallel arm units. EDA arms**:** rigid main and forearm, reinforced elbow.

10. Exterior door closers**:** tested to 100 hours of ASTM B117 salt spray test, furnish data on request.

11. Exterior doors**:** seasonal adjustments not required for temperatures form 120 degrees F to -30 degrees F, furnish checking fluid data on request.

12. Non-flaming fluid will not fuel door or floor covering fires.

13. Pressure Relief Valves (PRV) not permitted.
14. Accepted substitutions: None.

2.6 OTHER HARDWARE

A. Kick Plates: Four beveled edges, .050 inches minimum thickness, height and width as scheduled. Sheet-metal screws of bronze or stainless steel to match other hardware.

B. Door Stops: Provide stops to protect walls, casework, or other hardware.

1. Unless otherwise noted in Hardware Sets, provide floor type with appropriate fasteners. Where floor type cannot be used, provide wall type. If neither can be used, provide overhead type.

C. Seals: Four-fingered type at head & jambs. Inelastic, rigid back, not subject to stretching. Self-compensating for warp, thermal bow, door settling, and out-of-plumb. Adhesive warranted for life of installation.

1. Proposed substitutions: submit for approval.

2. Three-fingered type at hinge jambs of doors fitted with continuous hinges where jamb leaf of hinge is fastened to the frame reveal.

D. Thresholds: As scheduled and per details. Comply with CBC 2022 11B-404.2.5. Substitute products: certify that the products equal or exceed specified material's thickness. Proposed substitutions: submit for approval.

1. Saddle thresholds: 0.125 inches minimum thickness.

2. Exteriors: Seal perimeter to exclude water and vermin. Use sealant complying with requirements in Division 7 "Thermal and Moisture Protection". Minimum 0.25-inch diameter fasteners and lead expansion shield anchors, or Red-Head #SFS-1420 (or approved equivalent) Flat Head Sleeve Anchors. National Guard Products' "COMBO" or Pemko Manufacturing's "FHSL".

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.

2.7 FINISH:

A. Generally: BHMA 626 Satin Chromium.

1. Areas using BHMA 626: furnish push-plates, pulls and protection plates of BHMA 630, Satin Stainless Steel, unless otherwise scheduled.

B. Door closers: factory powder coated to match other hardware, unless otherwise noted.

2.8 KEYING REQUIREMENTS:

A. Key System: Schlage Classic Primus high-security utility-patented keyway, interchangeable core throughout. Utility patent protection to extend at least until 2014. Key blanks available only from factory-direct sources, not available from after-market key blank manufacturers. For estimate use factory GMK charge. Initiate and conduct meeting(s) with Owner and Allegion representatives to determine system keyway(s), keybow styles, structure, stamping, degree of physical security and degree of geographic exclusivity. Furnish Owner's written approval of the system; do not order keys or cylinders without written confirmation of actual requirements from the Owner. Owner will install permanent cylinders/cores.

1. Existing factory-registered master key system.

2. Primus Level 3G

3. Construction keying: furnish temporary keyed-alike cores. Remove at substantial completion and install permanent cylinders/cores in Owner's presence. Demonstrate that construction key no longer operates.

4. Temporary cylinders/cores remain supplier's property.

5. Furnish 10 construction keys, unless otherwise instructed by Owner.

6. Furnish 2 construction control keys, unless otherwise instructed by Owner.

7. Key Cylinders: furnish 6-pin solid brass construction, unless otherwise instructed by Owner.

B. Cylinders/cores: keyed at factory of lock manufacturer where permanent records are maintained. Locksets and cylinders same manufacturer.

C. Permanent keys: use secured shipment direct from point of origination to Owner.

1. For estimate: 3 keys per change combination, 5 master keys per group, 5 grand-master keys, 3 control keys, unless otherwise instructed by Owner.

2. For estimate: VKC stamping plus "DO NOT DUPLICATE".

D. Bitting List: use secured shipment direct from point of origination to Owner at completion.

PART 3 - EXECUTION

3.1 ACCEPTABLE INSTALLERS**:**

A. Can read and understand manufacturers' templates, suppliers' hardware schedule 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.

3.2 PREPARATION**:**

A. Ensure that walls and frames are square and plumb before hardware installation. Make corrections before commencing hardware installation. Installation denotes acceptance of wall/frame condition.

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 latching hardware between 34 inches to 44 inches above the finished floor, per California Building Code, Section 1008.1.9.2 and 11B-404.2.7.

3. Locate panic hardware between 36 inches to 44 inches above the finished floor.

4. Where new hardware is to be installed near existing doors/hardware scheduled to remain, match locations of existing hardware.

C. Existing frames and doors to be retrofitted with new hardware**:**

1. Field-verify conditions and dimensions prior to ordering hardware. Fill existing hardware cut outs not being reused by the new hardware. Remove existing hardware not being reused, return to Owner unless directed otherwise.

2. Remove existing floor closers not scheduled for reuse, fill cavities with non-shrinking concrete and finish smooth.

3. Cut and weld existing steel frames currently prepared with 2.25 inch height strikes. Cut an approximate 8-inch section from the strike jamb and weld in a reinforced section to accommodate specified hardware's strike.

4. 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.

3.3 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 than 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. Provide manufacturer's recommended brackets to accommodate the mounting of closers on doors with flush transoms.

D. Lubricate and adjust existing hardware scheduled to remain. Carefully remove and give to Owner items not scheduled for reuse.

E. Field-verify existing conditions and measurements prior to ordering hardware. Fill existing hardware cut outs not being used by the new hardware.

F. Remove existing hardware not being reused. Tag and bag removed hardware, turn over to Owner.

G. 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.

H. Provide manufacturer's recommended brackets to accommodate the mounting of closers on doors with flush transoms.

3.4. 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.

a) Door closer valves: turn valves clockwise until at bottom – do not force. Turn valves back out one and one-half turns and begin adjustment process from that point. Do not force valves beyond three full turns counterclockwise.

3. Adjust door closers per 1.9 this section.

4. Inspection of fire door assemblies and means-of-egress panic-hardware doors**:** Per 2022 NFPA-80 5.2.1: hire an independent third-party inspection service to prepare a report listing these doors and include a statement that there are zero deficiencies with the fire-rated assemblies and the openings with panic hardware.

B. Final inspection**:** Installer to provide letter to Owner that upon completion installer has visited the Project and has accomplished the following**:**

1. Has re-adjusted hardware.

2. Has evaluated maintenance procedures and recommend changes or additions and instructed Owner's personnel.

3. Has identified items that have deteriorated or failed.

4. Has submitted written report identifying problems.

3.5 DEMONSTRATION**:**

A. Demonstrate mechanical hardware, including adjustment and maintenance procedures.

3.6 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.

3.7 SCHEDULE OF FINISH HARDWARE

A. See door schedule in drawings for hardware set assignments.

B. Do not order material until submittal has been reviewed, stamped, and signed by Architect's door hardware consultant.

C. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

Opt. #: OPT0432380-V2

HARDWARE GROUP NO. 01
Provide each SGL door(s) with the following:

3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	CLASSROOM SECURITY W/ INSIDE INDICATOR	LV9071T 06N IS-LOC		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV EP		626	SCH
1	EA	SURFACE CLOSER	4011 TBWMS 1 3/4"		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP/HOLDER	FS40/41/42/43 AS REQ'D		626	IVE
1	SET	GASKETING	429AA-S		AA	ZER

HARDWARE GROUP NO. 02
Provide each SGL door(s) with the following:

3	EA	HINGE	5BB1HW SH 4.5 X 4.5 NRP		630	IVE
1	EA	PANIC HARDWARE	CDSI-PA-AX-98-NL-OP-110MD		626	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX X XQ11-948 36-083		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV EP		626	SCH
1	EA	DOOR PULL	VR910 NL SNB		630	IVE
1	EA	SURFACE CLOSER	4111 AVB EDA ST-1631 SPEC		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS18L/FS18S AS REQ'D		BLK	IVE
1	EA	RAIN DRIP	142AA (OMIT @ OVERHANG)		AA	ZER
1	SET	GASKETING	429AA-S		AA	ZER
1	EA	DOOR SWEEP	8192AA		AA	ZER
1	EA	THRESHOLD	545A-223 OR AS DETAILED		A	ZER

HARDWARE GROUP NO. 03
Provide each SGL door(s) with the following:

3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	L9040 06N L583-363 OS-OCC	626	SCH
1	EA	SURFACE CLOSER	4011 TBWMS 1 3/4"	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407CVX AS REQUIRED	630	IVE
1	SET	GASKETING	429AA-S	AA	ZER

HARDWARE GROUP NO. 04
Provide each SGL door(s) with the following:

3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM LOCK	LV9070T 06N	626	SCH
1	EA	PRIMUS CORE	20-740-XP EV EP	626	SCH
1	EA	SURFACE CLOSER	4011 TBWMS 1 3/4"	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP/HOLDER	FS40/41/42/43 AS REQ'D	626	IVE
1	SET	GASKETING	429AA-S	AA	ZER

HARDWARE GROUP NO. 05
Provide each PR door(s) with the following:

6	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	CONST LATCHING BOLT	FB51P	630	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	LV9070T 06N	626	SCH
1	EA	PRIMUS CORE	20-740-XP EV EP	626	SCH
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	630	IVE
2	EA	FLOOR STOP/HOLDER	FS40/41/42/43 AS REQ'D	626	IVE
1	SET	GASKETING	429AA-S	AA	ZER
1	EA	MEETING STILE	383AA	AA	ZER

HARDWARE GROUP NO. 06
Provide each PR door(s) with the following:

6	EA	HINGE	5BB1HW SH 4.5 X 4.5 NRP		630	IVE
1	EA	CONST LATCHING BOLT	FB51P		630	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2 AS REQ'D		626	IVE
1	EA	STOREROOM LOCK	LV9080T 06N		626	SCH
1	EA	PRIMUS CORE	20-740-XP EV EP		626	SCH
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB1/MB2 AS REQ'D		689	IVE
2	EA	SURFACE CLOSER	4111 AVB SHCUSH TBWMS		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	HEAD SEAL	188SBK PSA (@ HEAD)		BK	ZER
1	SET	SET SEAL	429AA-S (@ JAMBS)		BK	ZER
1	EA	ASTRAGAL	43SP		SP	ZER
2	EA	DOOR SWEEP	8192AA		AA	ZER
1	EA	THRESHOLD	545A-223 OR AS DETAILED		A	ZER

HARDWARE GROUP NO. 07
Provide each PR door(s) with the following:

6	EA	HINGE	5BB1HW SH 4.5 X 4.5 NRP		630	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	PANIC HARDWARE	CDSI-PA-AX-98-EO		626	VON
1	EA	PANIC HARDWARE	CDSI-PA-AX-98-NL-OP-110MD		626	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX X K510-730 36-083 (MULLION)		626	SCH
2	EA	MORTISE CYLINDER	20-061 ICX X XQ11-948 36-083		626	SCH
4	EA	PRIMUS CORE	20-740-XP EV EP		626	SCH
1	EA	DOOR PULL	VR910 DT SNB		630	IVE
1	EA	DOOR PULL	VR910 NL SNB		630	IVE
1	EA	SURFACE CLOSER	4111 AVB HEDA TBWMS		689	LCN
1	EA	SURFACE CLOSER	4111 AVB SHCUSH TBWMS		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS18L/FS18S AS REQ'D		BLK	IVE
1	SET	GASKETING	429AA-S		AA	ZER
1	EA	MULLION SEAL	8780NBK PSA		BK	ZER
1	EA	MEETING STILE	155AA		AA	ZER
1	EA	MEETING STILE	55AA		AA	ZER
2	EA	DOOR SWEEP	8192AA		AA	ZER
1	EA	THRESHOLD	547A-223(OR AS REQ'D. OR PER DETAIL/CONDITIONS)		A	ZER

HARDWARE GROUP NO. 08 - Not Used

HARDWARE GROUP NO. 09
Provide each SGL door(s) with the following:

3	EA	HINGE	5BB1HW 4.5 X 4.5		630	IVE
1	EA	CLASSROOM LOCK	LV9070T 06N		626	SCH
1	EA	PRIMUS CORE	20-740-XP EV EP		626	SCH
1	EA	OH STOP	100S		630	GLY
1	EA	SURFACE CLOSER	4011 ST-1544 TBSRT		689	LCN
1	EA	MOUNTING PLATE	4020-18 SRT		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	SET	GASKETING	429AA-S		AA	ZER
1	EA	DOOR SWEEP	8192AA		AA	ZER
1	EA	THRESHOLD	547A-223(OR AS REQ'D. OR PER DETAIL/CONDITIONS)		A	ZER

HARDWARE GROUP NO. 10
Provide each PR door(s) with the following:

1	EA	PANIC HARDWARE	CDSI-PA-AX-98-EO		626	VON
1	EA	ELEC PANIC HARDWARE	RX-QELX-PA-AX-35A-NL-OP-388		626	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
1	EA	MORTISE CYLINDER	20-061 ICX X XQ11-948 36-083		626	SCH
2	EA	PRIMUS CORE	20-740-XP EV EP		626	SCH
1	EA	SURFACE CLOSER	4111 AVB EDA TBWMS		689	LCN
1	EA	SURFACE CLOSER	4111 AVB SCUSH TBWMS		689	LCN
2	EA	MOUNTING PLATE	4110-18 SRT AS REQ'D		689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30 SRT AS REQUIRED		689	LCN
2	EA	BLADE STOP SPACER	4110-61 SRT AS REQUIRED		689	LCN
	EA	NOTE	REUSE BALANCE OF EXISTING HARDWARE			

VERIFY EXISTING DOOR AND FRAME PREP PRIOR TO ORDERING HARDWARE.

END OF SECTION

Door Numbers	HwSet#
D01	01
D02	02
D03	03
D04	03
D05	03
D06	04
D07	02
D08	01
D09	05
D10	06
D12	07
D13	07
D14	09
D15	09
D16	10

Catalog Cuts

For

Rosemond High Early College Campus Dance/Weight Rooms Modernization

Sorted By DHI Sequence

Prepared By

David E Harder

Created On 2/26/2026

Generated By



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LCN	4111 AVB EDA TBWMS	SURFACE CLOSER		92
LCN	4111 AVB HEDA TBWMS	SURFACE CLOSER		92
LCN	4111 AVB SCUSH TBWMS	SURFACE CLOSER		92
LCN	4111 AVB SHCUSH TBWMS	SURFACE CLOSER		92
LCN	4110-18 SRT AS REQ'D	MOUNTING PLATE		NA
LCN	4110-30 SRT AS REQUIRED	CUSH SHOE SUPPORT		NA
LCN	4110-61 SRT AS REQUIRED	BLADE STOP SPACER		NA
LCN	4020-18 SRT	MOUNTING PLATE		98
IVE	8400 10" X 1" LDW B-CS	KICK PLATE		104
IVE	8400 10" X 2" LDW B-CS	KICK PLATE		104
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112XY Full Mortise - Narrow Frame and Door Leaf

UL10C certified
Meets ANSI 156.26 for 150 lbs and 300 lbs.

- For 1 3/4" Doors
- Patented center loaded, interlocking bearing design
- Non Handed for custom cut lengths
- Flush Mounted, No inset
- 48" Maximum Door Width
- Beveled or Square Edge Doors
- Frame guidance lip is extended further for retrofit applications to cover existing heavy weight architectural hinge preps
- For doors weighing up to 450 pounds without reinforcing, 600 pounds with reinforcing
- For lead-lined application consult factory for engineering specials

Standard lengths 83", 85", 95", 119"

Standard Mounting Hardware

12-24 x 3/4" Steel Self Drilling / Self Tapping Phillips Head Screw

Finishes

Clear Anodized (US28), Dark Bronze Anodized (313AN)
Custom Anodizing and Painting are available, consult factory

Options:

HT	Hospital Tip
EPT	Electric Power Transfer
TWP CON	Electrical Through Wire Panel with Allegion Connect

Optional Mounting Hardware:

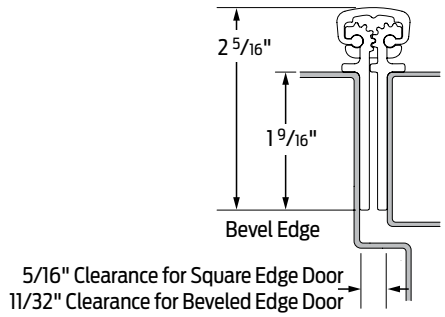
TEK/WD	1/2 Self Drill, Self Tap 1/2 Wood
WD	Wood Door and Frame

Available Accessory Kits:

Security Screws - Hollow Metal
Security Screws - Wood
Thread Forming Screws

For Single Door Applications

For pairs of doors see chart and general information





Meets ANSI/BHMA A156.1
A8133 – Steel
A5133 – Stainless Steel
A2133 – Brass

5PB1 5 Knuckle, Plain Bearing Full Mortise Hinge

- For standard weight doors
- Low frequency usage
- Packed with wood and metal screws

Not for use with a door closer.

Options

- NRP, Non-Removable Pin
- SH, Security Stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge
3.5 x 3.5	89 x 89	0.123
4 x 4	102 x 102	0.134
4.5 x 4	114 x 102	0.134
4.5 x 4.5	114 x 114	0.134
5 x 4.5	127 x 114	0.134



Meets ANSI/BHMA A156.1
A8112 – Steel
A5112 – Stainless Steel
A2112 – Brass

5BB1 5 Knuckle, Ball Bearing Full Mortise Hinge

- For standard weight doors
- Medium frequency usage
- 2 ball bearing
- Packed with wood and metal screws

Options

- NRP, Non-Removable Pin
- SH, Security Stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge	Size (Inches)	Size (mm)	Gauge
3.5 x 3.5	80 x 102	0.130	5 x 4.5	127 x 114	0.146
4 x 4	102 x 102	0.130	5 x 5	127 x 127	0.146
4.5 x 4	114 x 102	0.134			
4.5 x 4.5	114 x 114	0.134			

Finishes *brass*

Ives Finish	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	605	606	612	613	614	616	619	625	626

Finishes *steel*

Ives Finish	USP	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	600	632	633	639	640	641	643	646	651	652

Finishes *stainless steel*

Ives Finish	US32	US32D
BHMA	629	630



Meets ANSI/BHMA A156.1
A8111 – Steel
A5111 – Stainless Steel
A2111 – Brass

5BB1HW 5 Knuckle, Ball Bearing, Heavy Weight Full Mortise Hinge

- For heavy weight doors
- High frequency usage
- 4 ball bearing
- Packed with wood and metal screws

Options

- NRP, Non-Removable Pin
- SH, Security Stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge	Size (Inches)	Size (mm)	Gauge
4.5 x 4	114 x 102	0.180	5 x 4.5	127 x 114	0.190
4.5 x 4.5	114 x 114	0.180	5 x 5	127 x 127	0.190



Meets ANSI/BHMA A156.1
A8111 – Steel

5BB1WT 5 Knuckle, Ball Bearing, Wide Throw Full Mortise Hinge

- For medium weight doors
- Medium frequency usage
- 2 ball bearing
- Packed with wood and metal screws

Options

- NRP, Non-Removable Pin
- SH, Security Stud
- HT, Hospital Tip
- RC, Round Corners - 1/4" or 5/8" Radius
- SEC, Security Fastners - Pin-in-Socket

Dimensions

Size (Inches)	Size (mm)	Gauge
4.5 x 5	114 x 127	0.134
4.5 x 6	114 x 152	0.134
5 x 6	127 x 152	0.146
5 x 7	127 x 178	0.146
5 x 8	127 x 203	0.146

Finishes *brass*

Ives Finish	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	605	606	612	613	614	616	619	625	626

Finishes *steel*

Ives Finish	USP	US3	US4	US10	US10B	US10A	US11	US15	US26	US26D
BHMA	600	632	633	639	640	641	643	646	651	652

Finishes *stainless steel*

Ives Finish	US32	US32D
BHMA	629	630



Meets ANSI A156.3 Type 27.
UL Listed 3 Hour Fire Doors 8'0" x 10'0"

FB51P Top and Bottom Bolts (Pair)

- Constant Latching—inactive door remains latched until the active door is opened, releasing the automatic bottom bolt and then the top bolt can be manually released. Inactive door will relatch automatically when closed.
- Low Actuation Forces.
- Fits standard ANSI A115.4 Door and Frame Preparations.
- Non-handed.
- 3/4" bolt throw with a 7/8" vertical adjustment.
- 3/4" backset
- Standard Rod Length is 12", which is measured from the center of the flush bolt body to the bolt tip. Optional rod lengths available for top bolt only on non-fire rated openings—18", 24", 36" and 48".

DP1 or DP2 optional dust proof strike available, see page C11.

FB51T Top Bolt Only



Meets ANSI A156.3 Type 27.
UL Listed 3 Hour Fire Doors 8'0" x 10'0"

FB52 Top Bolt with Auxiliary Fire Latch

- FB52 Model with Auxiliary Fire Latch eliminates the bottom bolt and is UL Listed for Fire Doors.

FB53 Top Bolt with Auxiliary Fire Latch & Retrofit Plate

- FB53 Model with Auxiliary Fire Latch eliminates the bottom bolt and includes a retrofit plate to cover existing bottom bolt prep. UL Listed for Fire Doors.

Dimensions

Body Size: 1" Wide x 6-3/4" Long x 2" Deep

Guide Size: 1" Wide x 1-27/32" Long x 11/16" High x 3/32" Thick

Strike Size: 15/16" Wide x 2-1/4" Long x 1/16" Thick

Rub Plate Size: 1-1/4" Wide x 1-11/16" Long x 3/64" Thick

Auxiliary Fire Latch Size: 1" Wide x 1-3/4" Long x 3-1/4" Deep

Retrofit Plate Size: 1" Wide x 6-3/4" Long x 3/32" Thick

Finishes

Ives Number	US3	US4	US10	US10B	US32	US32D
BHMA	605	606	612	613	629	630



DP1



DP2

Meets Meets ANSI/BHMA 156.16, L14011.

DP1
DP2 Dust Proof Strikes

- Designed for use with the bottom bolt of all flush bolts.
- Spring-loaded plunger returns to floor or threshold level anytime flush bolt is retracted, eliminating need to clean standard floor strikes.
- Strike hole is 3/4" Diameter and 1-1/8" Deep

Dimensions

DP1 Face Plate: 1-7/16" Diameter
DP2 Face Plate: 1-5/8" W x 3-1/2" L x 1/8" Thick
Body: 1-3/16" Diameter x 1-7/8" Deep

Finishes

Ives Number	US3	US4	US10	US10B	US26	US26D
BHMA	605	606	612	613	625	626

Mullions

Mullions

Removable steel mullions Mullions provide single door performance in double door openings with rim devices. Mullions are easily removed by loosening bottom set screw and removing top fitting cover. The top mullion fitting is attached to the frame and is concealed by the fitting cover.

Steel mullions are 2" (51mm) wide and 3" (76mm) deep, with a wall thickness of 1/8" (3mm).

Mullions are shipped with mounting screws and prepared for strikes. Strikes are not included except where indicated.

Steel mullions are available in SP28 and SP313 finishes. Consult factory for other powder coat finish options.

KR – Keyed removable steel mullions makes removal faster and easier by a single operation of the mortise cylinder. Once mullion is removed, large equipment or furniture can freely pass through the opening. The unit will self lock when re-installed, without use of the cylinder key. Uses a 1 1/4" mortise cylinder with a straight cam (Schlage cam reference B502-191). Cylinders are sold separately. Prefix mullion model with "KR".

Removeable aluminum mullions are 1 1/16" (27mm) wide on face closest to the door and 2 3/8" (60mm) at the widest point. The depth is 3 1/8" (79mm) with a wall thickness of 1/8" (3mm).

Aluminum mullions are available in US4, US10, US28, 313 and 315 finishes. Consult factory for other powder coat finish options.

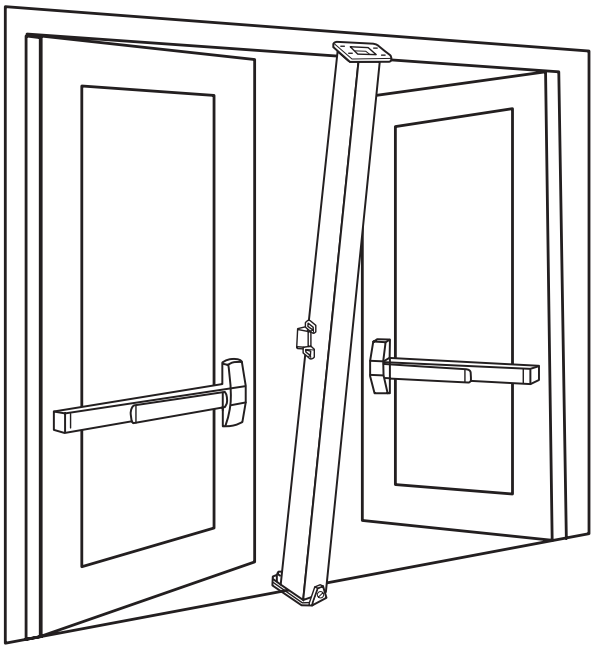
Stock Hollow Metal Applications for devices mounted to cover ANSI 161 cutouts are higher than the standard mullion strike location. Consult the factory for special strike preparation or order a blank mullion. See below.

Blank Mullions are furnished without strike preparation. They are used to mount devices at a strike height different from the standard mullion preparation.

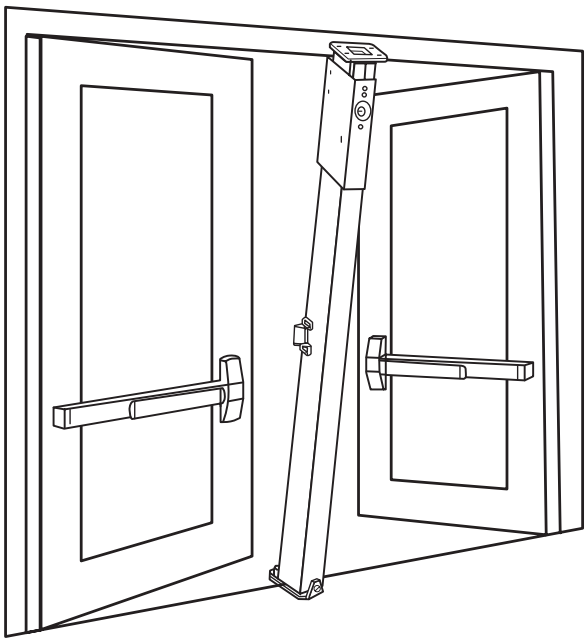
To order, specify:

1. For keyed Removable option on steel mullions, prefix model number with "KR"
2. Model number.
3. Height of opening
4. Finish
5. Handing if required.
6. Centerline deviation (refer to device template for standard centerline).
7. Strikes, when required, should be ordered with device.
8. For keyed Removable option on steel mullions, prefix model number with "KR"

Removable mullions



Keyed removable steel mullions



Mullions

Steel mullions

1654 Prepared for two 1606 strikes. **If 1606 strikes are not specified on the order, two per mullion will be added. Additional charges apply.**

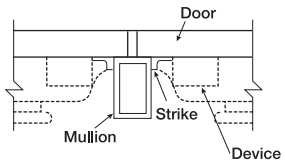
4954 Prepared for 264 or 299 strikes. For use with all Von Duprin Panic rim devices. **Note: specify strike choice with device.**

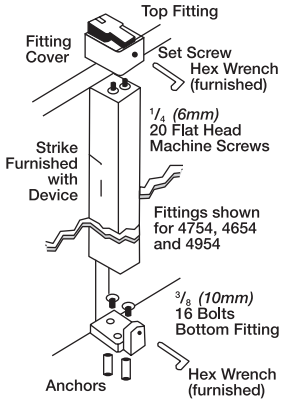
9954 Prepared for and must be used with two 268 strikes (88-F device), or two 499F (22-F, 98-F, 99F devices). UL fire labeled mullion for up to 3 hour opening using Von Duprin fire exit rim devices. This mullion is not easily removed due to special fittings.

22-F and 88-F devices are rated up to 8' x 8" (2438mm x 2438mm).

98-F and 99-F devices are rated up to 10'0" (3048mm).

Note: If 268 or 499F strikes are not specified on the order, two per mullion will be added. Additional charges apply.



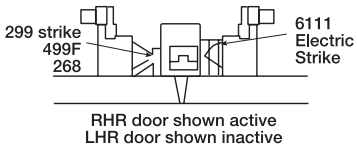


4754 Prepared for two 4263 monitor strikes.

4854 Prepared for one 299 and one 6111 electric strike. Indicate handing for electric strike.

9854 Prepared for one 268 or 499F strike and one 6111 electric strike. Indicate handing for electric strike. UL fire labelled mullion for up to 3 hour openings up to 8' x 8' (2438mm x 2438mm) using Von Duprin Fire Exit Rim Devices

4854/9854 – Using one electric strike



Aluminum mullions

5654 Prepared for two 264 or 299 strikes with weatherstripping. Includes one set of 154 stabilizers.

5754 Prepared and furnished with one 1408 double door strike. Includes one 154 stabilizer set. Note: specify device "less strike".

Sizes for mullions

1654, 4954, 4754, 4854, 5654	**9854, 9954**
7' 2" (2184mm)	7' 3" (2210mm)
*8' 2" (2489mm)	8' 3" (2475mm)
*10' 2" (3099mm)	10' 3" (3124mm)

KR1654, KR4954, KR4754, KR4854	**KR9854**, KR9954***
7' 6" (2286mm)	7' 5" (2261mm)
8' 6" (2591mm)	*8' 5" (2565mm)
10' 6" (3200mm)	*10' 5" (3175mm)

* Only qualifying applications will be provided with UL Label.
** Fire rated same as 9854
*** Fire rated same as 9954



Angle plate is used with narrow transom frames. The plate attaches to the transom extending the surface area needed to mount the mullion. Must be ordered separately. Specify finish.

154 Stabilizer is a two-piece interlocking set. One piece mounts on the mullion with the top mounting hole 5 3/16" (148mm) below the centerline of the strike; the other piece mounts on the door. Shims are provided to adjust for misalignment between the door and mullion.



The set maintains integrity between the door and mullion to prevent vandalism and to ensure contact between the device and strike as the doors expand and contract with temperature changes.

Furnished standard on aluminum mullions; optional for steel and all blank steel mullions.

MT54 Storage kit is a set of floor and wall brackets that provide convenient storage of the keyed removable mullion when removed from the opening.

To order, specify

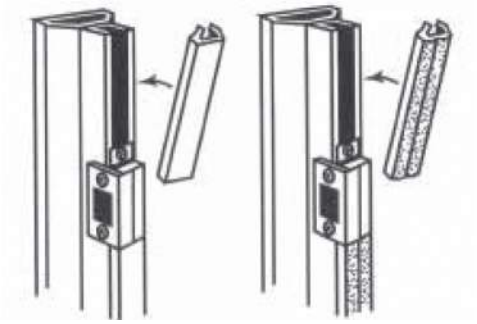
1. Model MT54.

2. Finish SP28, SP313, or SPBLK

Weatherstripping

Weatherstripping

Weatherstripping prevents cold air from blowing between doors and mullion. It also serves as a silencer when the door is closed against the mullion. The silicone treated weatherstrip pile is bonded to a polypropylene backing. A slide-in molding houses the weatherstripping, covers mounting screws of the strike and extends to both the top and bottom of the mullion. Available on aluminum mullions only.



Standard edging

Edging with weatherstripping

L Series

Grade 1, Mortise Locks

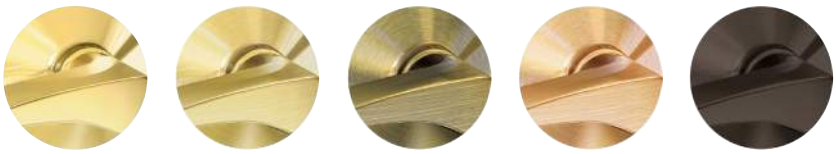


OVERVIEW

The Schlage® L Series has long been the benchmark for Grade 1 mortise locks. Beyond strength and security–it offers flexibility to meet most needs. 67 mechanical functions include ten non-levered small- and large-case deadbolt functions and 15 electrified functions regularly used as part of electronic access control systems, six of which feature motorized latch retraction. L Series locks have the ability to suite across electronic, tubular, exit trim, and multi-point locks to integrate seamlessly into any environment. The series features an array of security options including patented, 180-degree high visibility lock status indication trim, key override of a thumbturn being held, and support for multiple keyway families and cylinder types including Primus® XP high-security cylinders.



FINISHES



605
Bright Brass

606
Satin Brass

609
Antique Bronze

612[1]
Satin Bronze

613[1]
Oil Rubbed Bronze

619
Satin Nickel

622
Matte Black

625
Bright Chrome

626
Satin Chrome

626AM
Satin Chrome Antimicrobial

629[2]
Bright Stainless Steel

630[2]
Satin Stainless Steel

630AM[2]
Satin Stainless Steel Antimicrobial

643e
Aged Bronze



1. Available on standard levers only, not available on Latitude, Longitude, Accent, Asti, or Merano.
2. Not available on Accent, Asti, or Merano.

M COLLECTION DECORATIVE LEVER STYLES[1]



M51
851 - Knurled tactile warning[2]



M52 (Broadway)
852 - Knurled tactile warning[2]



M53



M54



M55



M56



M57[3]



M61
Handed

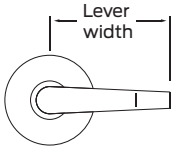


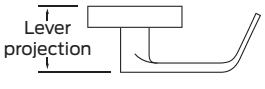
M62[3]
Handed



M63
Handed

Dimensions		
Lever	**Width**	**Projection**
M51	4.5"	3.2"
M52 (Broadway)	4.5"	3"
M53	4.35"	3.2"
M54	4.35"	2.75"
M55	4.3"	3"
M56	4.6"	3"
M57	4.5"	2.9"
M61	4.5"	3.2"
M62	4.5"	2.7"
M63	4.5"	3.2"





1. M Collection not available in 612 and 613 finishes.
2. Knurled tactile warning available on 609, 612, 613, 625, 626, 629, and 630 finishes only.
3. Available in 629, 630, and 630AM only.

Note: Images shown with Schlage L mortise 'A' rose; additional rose and escutcheon designs available.

M COLLECTION DECORATIVE LEVER STYLES[1]



M81 (Boardwalk)
881 - Knurled tactile warning[2]



M82



M83



M84



M85
Handed



ME1
8ME1 - Milled tactile warning
Handed



ME2
8ME2 - Milled tactile warning
Handed

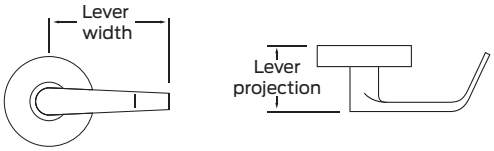


ME3
8ME3 - Milled tactile warning

Dimensions

Lever	Width	Projection
M81 (Boardwalk)	4.8"	2.9"
M82	4.8"	2.9"
M83	4.6"	2.9"
M84	5.1"	3"
M85	4.9"	3.3"
ME1	5.5"	3"
ME2	5.2"	2.8"
ME3	5.1"	3.2"

Return to door meets 1/2" requirement for all levers shown on this page.



1. M Collection not available in 612 and 613 finishes.
2. Knurled tactile warning available on 609, 612, 613, 625, 626, 629, and 630 finishes only.

Note: Images shown with Schlage L mortise 'A' rose; additional rose and escutcheon designs available. ME1, ME2 and ME3 ergonomic levers designed with Gensler as product design consultant.

STANDARD LEVER AND KNOB STYLES



01
801 - Milled tactile warning



02
802 - Knurled tactile warning[1]



03 (Tubular)
803 - Knurled tactile warning[1]



05
805 - Milled tactile warning



06 (Rhodes)
806 - Milled tactile warning



07 (Athens)
807 - Milled tactile warning



12
812 - Milled tactile warning
Handed



17 (Sparta)
817 - Milled tactile warning

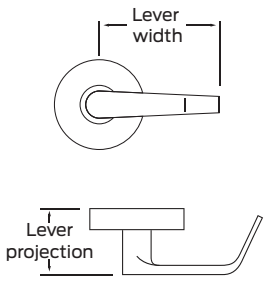


18
818 - Milled tactile warning

Dimensions

Lever	Width	Projection
01	3.88"	2.69"
02	4.75"	2.81"
03 (Tubular)	4.75"	2.81"
05	3.75"	2.88"
06 (Rhodes)	4.63"	2.5"
07 (Athens)	4.63"	2.88"
12	4.63"	3.06"
17 (Sparta)	4.75"	3"
18	4.88"	2.69"

Return to door meets 1/2" requirement for 03, 06 and 17 levers.



1. Knurled tactile warning available on 609, 612, 613, 625, 626, 629, and 630 finishes only.

Note: Images shown with Schlage L mortise 'A' rose; additional rose and escutcheon designs available.

STANDARD LEVER AND KNOB STYLES



ACC (Accent)[1]
Handed



AST (Asti)[1]
Handed



LAT (Latitude)[2]



LON (Longitude)[2]



MER (Merano)[1]
Handed



OME (Omega)



41

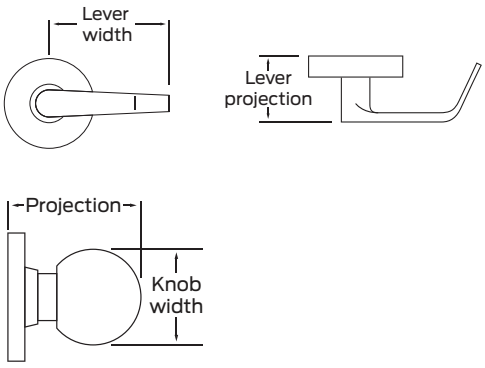


42

Dimensions

Lever	Width	Projection
ACC (Accent)	4.13"	3.13"
AST (Asti)	4"	2.63"
LAT (Latitude)	4.75"	2.56"
LON (Longitude)	4.88"	2.56"
MER (Merano)	4"	3.13"
OME (Omega)	5.06"	3.31"
41	2.21"	2.34"
42	2.13"	2.54"

Return to door meets 1/2" requirement for Longitude and Omega levers.



1. Not available in 612, 613, 629, or 630 finishes.
2. Not available in 612 or 613 finishes.

Note: Images shown with Schlage L mortise 'A' rose; additional rose and escutcheon designs available.

ESCUTCHEONS



L full face
Specify by adding 'L' after lever design.

Finishes: available in all L Series finishes.



L concealed
Specify by adding 'C' suffix to function and by adding 'L' after lever design.

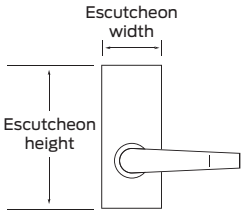
Finishes: available in all L Series finishes.



N full face
Specify by adding 'N' after lever design.

Finishes: available in all L Series finishes.

Escutcheon	Width	Height
L full face	1.75"	7.938"
L concealed	1.75"	7.938"
N full face	2.5"	7.875"



ROSES



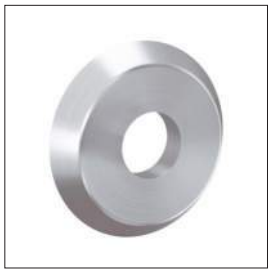
A rose
Available for use on L Series knob and lever designs. Specify by adding 'A' after lever design.

Finishes: available in all L Series finishes.



B rose
Available for use on L Series knob and lever designs. Specify by adding 'B' after lever design.

Finishes: available in all L Series finishes.



C rose
Available for use on L Series knob and lever designs. Specify by adding 'C' after lever design.

Finishes: 605, 606, 609, 619, 622, 625, 626, 629, 630, 643e.



AVA rose
Available for use with AST lever only. Specify as ASTAVA.

Finishes: 605, 606, 609, 619, 622, 625, 626, 643e.



MER rose
Available for use with MER lever only. Specify as MERMER.

Finishes: 605, 606, 609, 619, 622, 625, 626, 643e.

Rose	Diameter
A	2.125"
B	2.562"
C	2.625"
AVA	2.625"
MER	2.625"



THUMBTURNS



ADA thumbturn (standard)
09-544



Large ADA thumbturn
09-509 x L583-363
Not available with L9463 and L463



Basic thumbturn

INDICATORS

Inside Trims



Thumbturn



Key cylinder



Chevron

Standard for lock functions L9486, L9496 and L496, used with A or B roses only. Available messages: "OCCUPIED", "DO NOT DISTURB" or "LOCKED".

Outside Trims



Emergency key



Coin turn



Key cylinder

Available messages

	LOCKED	OCCUPIED	DO NOT DISTURB	
	UNLOCKED	VACANT		
Inside trim	IS-LOC	IS-OCC	IS-DND	IS-SYM
Outside trim	OS-LOC	OS-OCC	OS-DND	OS-SYM
Inside trim	IS-LOCFR	IS-OCCFR	–	–
Outside trim	OS-LOCFR	OS-OCCFR	–	–

Note: Spanish language options available via RFQ.

Dimensions

	Width	Height
Escutcheon	2.6"	9.7"
Sectional	2.6"	6.1"
Main window	2"	0.6"
Side windows	0.3"	0.6"

LIGATURE-RESISTANT SOLUTIONS



SL1[1,2]



SK1[1,2]



HSLR[2,3]
Handed

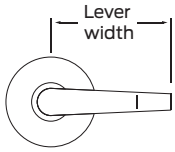
Specifications and certifications

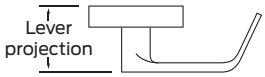
	SL1	SK1	HSLR
Accepted by OHM	●	●	●
ADA compliant	●	-	●
Suitable for:			
High risk areas	-	●	●
Medium risk areas	●	●	●
Low risk areas	●	●	●

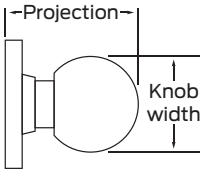
Caution: Cone shaped door knobs and thumbturns do not comply with ADA requirements for graspability.

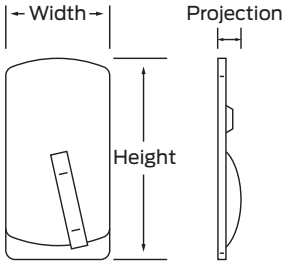
Dimensions

	Width	Height	Projection
SL1	4.5"		3.13"
SK1	3.19"		2.3125"
HSLR	6"	13.17"	2.27"





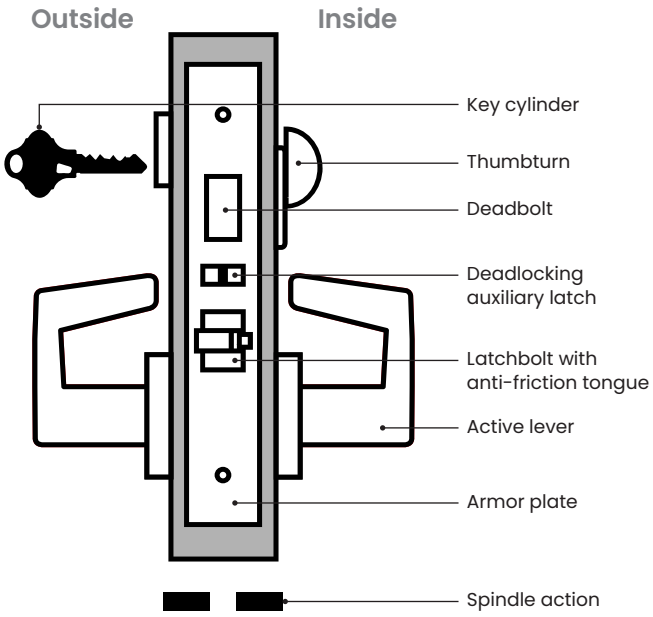




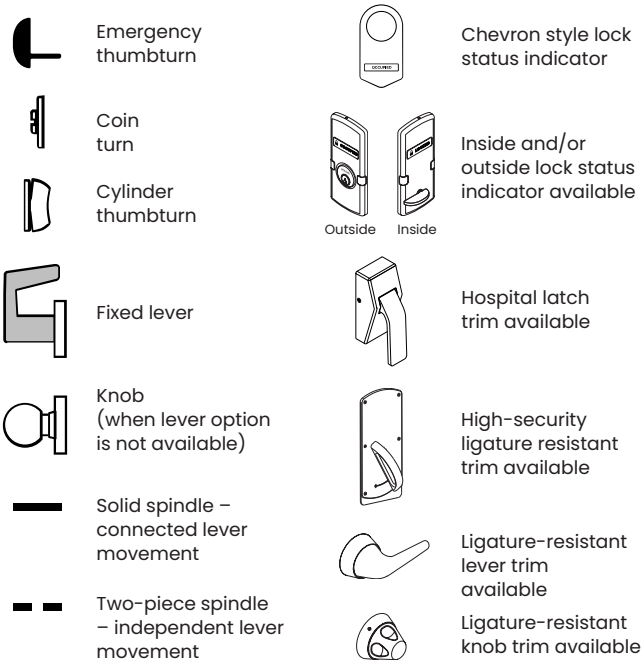
1. Only available in 630 and 630AM finishes.
2. Not available with Vandlgard option.
3. Only available in 630 finish.

MECHANICAL LOCK FUNCTIONS

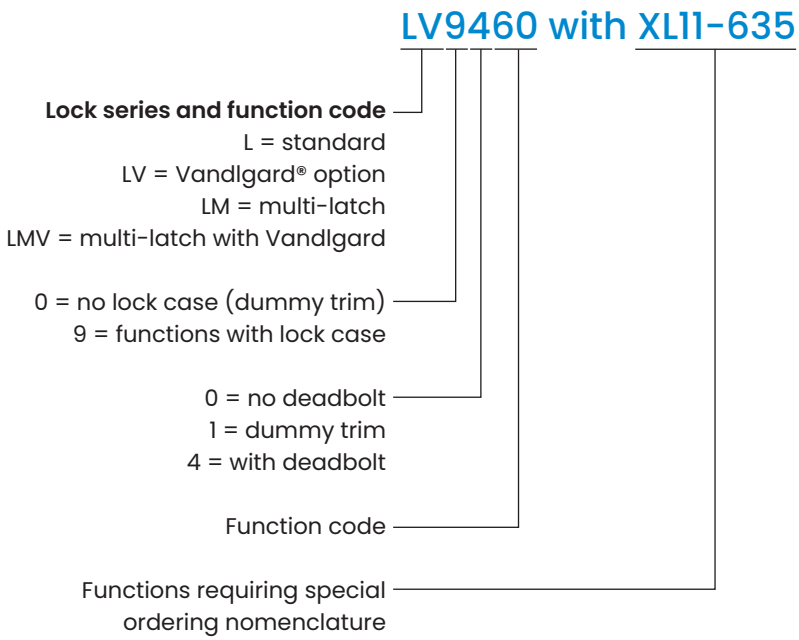
Legend



Key



Product identification guide



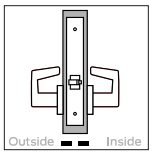


Vandlgard® feature helps protect the lock chassis from damage.

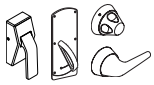
The Vandlgard optional feature available on many functions allows the outside lever to rotate freely down when in a locked state. This limits the ability of vandals to apply excessive force to the lever helping to prevent damage to internal components.

NON-KEYED FUNCTIONS

Schlage **ANSI**
L9010 **F01**

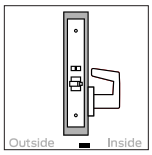


Passage latch



- Levers (or knobs) only-both sides; latchbolt only
- Latchbolt retracted by lever (or knob) from either side at all times
- Inside lever always free for immediate egress

Schlage **ANSI**
L9025 **F31**

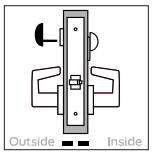


Exit or communicating lock

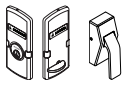
- No outside trim; lever (or knob) only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from inside only
- Inside lever always free for immediate egress

When ordering, specify door handing.

Schlage **ANSI**
L/LV9040 **F22**



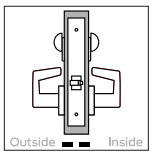
Bath/bedroom privacy lock



- Emergency thumbturn access outside; thumbturn inside; latchbolt only
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by rotating inside thumbturn; Vandlgard® option allows outside lever to rotate freely down while locked
- To unlock from outside, remove access hole cover, insert emergency thumbturn (furnished) and rotate
- Rotating inside thumbturn unlocks outside lever; turning inside lever retracts latchbolt and unlocks outside lever; closing door also unlocks preventing lock-out
- Inside lever always free for immediate egress

Note: Hospital latch trim not available with Vandlgard option.

Schlage **ANSI**
L/LV9040 with XL11-446 **-**



Privacy with thumbturn both sides

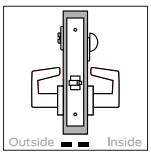


- Thumbturn both sides; latchbolt only
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by rotating either thumbturn; Vandlgard® option allows outside lever to rotate freely down while locked
- Rotating either thumbturn unlocks outside lever
- Rotating inside lever retracts latchbolt and unlocks outside lever; closing door also unlocks
- Inside lever always free for immediate egress

Note: Available in rose or L escutcheon trim only.

To order, specify function and note XL11-446 as a special option.

Schlage **ANSI**
L/LV9044 **-**



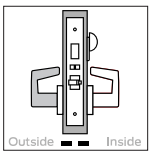
Privacy with coin turn outside



- Coin turn outside; thumbturn inside; latchbolt only
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by rotating outside coin turn or inside thumbturn; Vandlgard® option allows outside lever to rotate freely down while locked
- Rotating outside coin turn unlocks outside lever
- Rotating inside thumbturn unlocks outside lever; turning inside lever retracts latchbolt and unlocks outside lever; closing door also unlocks preventing lock-out
- Inside lever always free for immediate egress

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L9412 **-**

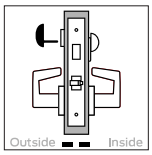


Exit lock with deadbolt

- Lever (or knob) only-outside; thumbturn inside with lever; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside lever (or knob) always fixed; latchbolt retracted by inside lever
- Deadbolt thrown or retracted by rotating inside thumbturn
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

NON-KEYED FUNCTIONS

Schlage **ANSI**
L/LV9440 **F19**

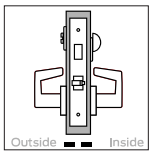


Privacy with deadbolt



- Emergency thumbturn access outside; thumbturn inside; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by rotating inside thumbturn; Vandlgard® option allows outside lever to rotate freely down while locked
- To unlock from outside, remove access hole cover, insert emergency thumbturn (furnished) and rotate
- Rotating inside thumbturn unlocks outside lever; turning inside lever retracts both deadbolt and latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Schlage **ANSI**
L/LV9444 **-**



Privacy with deadbolt and coin turn outside

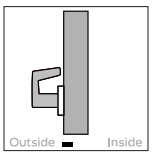


- Coin turn outside; thumbturn inside; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by rotating inside thumbturn or outside coin turn; Vandlgard® option allows outside lever to rotate freely down while locked
- Rotating outside coin turn retracts deadbolt and unlocks outside lever
- Rotating inside thumbturn unlocks outside lever; turning inside lever retracts both deadbolt and latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Note: Ligature-resistant trims not available with Vandlgard option.

NON-KEYED DUMMY FUNCTIONS

Schlage **ANSI**
L0170 **-**



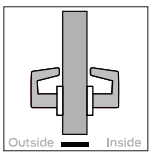
Half dummy trim

- Lever (or knob) only-one side; no armor front or mortise case
- Lever always fixed

Note: Do not use on hollow core wood doors. All metal door applications require reinforcement.

Ordering: Specify door handing. Additionally, when ordering with escutcheon trim, an inside escutcheon with through bolts will be provided.

Schlage **ANSI**
L0172 **-**

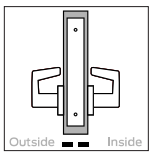


Full dummy trim

- Levers (or knobs) only-both sides; no armor front or mortise case
- Both levers always fixed

Note: All metal door applications require reinforcement.

Schlage **ANSI**
L9110 **-**



Full dummy trim with active levers

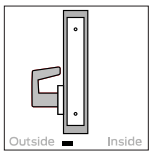
- Levers (or knobs) only-both sides; blank armor front without latchbolt
- Both levers always active

Note: Includes blank armor front and lock case.

May be ordered with optional XL11-743 armor front with cutout to receive deadbolt.

NON-KEYED DUMMY FUNCTIONS

Schlage **ANSI**
L9175 **-**



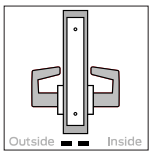
Half dummy trim with lock case

- Lever (or knob) only-one side; blank armor front without latchbolt
- Lever always fixed

Note: Includes blank armor front and lock case.

Door handing must be specified. May be ordered with optional XL11-743 armor front with cutout to receive deadbolt.

Schlage **ANSI**
L9176 **-**



Full dummy trim with lock case

- Levers (or knobs) only-both sides; blank armor front without latchbolt
- Both levers always fixed

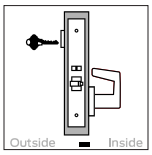
Note: Includes blank armor front and lock case.

May be ordered with optional XL11-743 armor front with cutout to receive deadbolt.

Ordering: In a double-door application where dummy is used as the strike, order 10-091 armored front strike separately.

SINGLE CYLINDER NON-DEADBOLT FUNCTIONS

Schlage **ANSI**
L9026 **-**



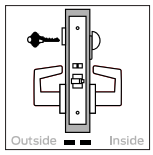
Exit lock with cylinder

- Key cylinder only, no lever (or knob) outside; lever only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever from inside
- Key outside retracts latchbolt
- Inside lever always free for immediate egress

Note: Available in rose or L escutcheon trim only.

When ordering, specify door handing.

Schlage **ANSI**
L/LV9050 **F04**



Entrance/office lock

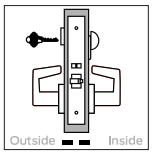


- Key cylinder outside; thumbturn inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key outside or by turning inside thumbturn; Vandlgard® option allows both levers to rotate freely down while locked
- Key outside unlocks outside lever and retracts latchbolt
- Rotating inside thumbturn unlocks outside lever; turning inside lever retracts latchbolt but does not unlock
- Inside lever always free for immediate egress

Caution: Egress without fully rotating the thumbturn to vertical position can result in lock-out situations.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9056 **-**
L/LV9056 with XL13-439 key override



Entrance/office lock with automatic unlocking



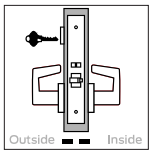
- Key cylinder outside; thumbturn inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key outside or by turning inside thumbturn; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside unlocks outside lever and retracts latchbolt; XL13-439 option allows key to retract latchbolt overriding thumbturn if being held in locked position
- Rotating inside thumbturn unlocks outside lever; turning inside lever retracts latchbolt and unlocks outside lever; closing door also unlocks preventing lock-out
- Inside lever always free for immediate egress

Note: Ligature-resistant trims not available with Vandlgard option.

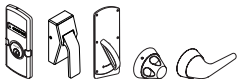
To order with key override, specify function and note XL13-439 as a special option.

SINGLE CYLINDER NON-DEADBOLT FUNCTIONS

Schlage **ANSI**
L/LV9070 **F05**



Classroom lock, exterior lockdown only

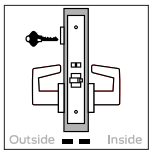


- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever from either side
- Outside lever is made inoperative by key outside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside unlocks outside lever and retracts latchbolt
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9076 **F06**



Classroom holdback lock, exterior lockdown only



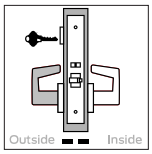
- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever from either side
- Outside lever is made inoperative by key outside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside unlocks outside lever and retracts latchbolt
- Rotate inside lever while turning key 360° to activate retracted latch holdback feature; to deactivate, reverse key rotation 360°
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key.

Note: Locks with holdback feature are not UL listed. Installation should be in accordance with existing codes only.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9080 **F07**



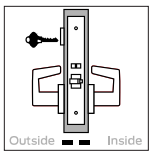
Storeroom lock



- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Outside lever always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts latchbolt
- Inside lever always free for immediate egress

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9081 **-**



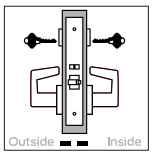
Accessible storeoom lock

- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever from either side
- Outside lever is made inoperative by key outside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside inserted and turned 280° unlocks allowing outside lever to retract latchbolt
- Inside lever always free for immediate egress

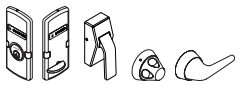
When ordering, specify door handing.

DOUBLE CYLINDER NON-DEADBOLT FUNCTIONS

Schlage **ANSI**
L/LV9060 **F09**



Apartment entrance lock

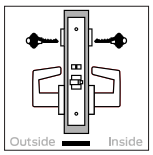


- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key inside; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts latchbolt but cannot lock or unlock outside lever
- Rotating inside lever retracts latchbolt; key inside retracts latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key inside.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L9066 **-**



Store lock

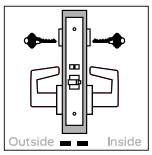


- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Both levers are made inoperative by key from either side
- Key use on either side unlocks both levers and retracts latchbolt

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9071 **F32**



Classroom security lock, interior/exterior lockdown

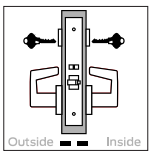


- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key from either side; Vandlgard® option allows outside lever to rotate freely down while locked
- Rotating inside lever retracts latchbolt; key on either side unlocks outside lever and retracts latchbolt
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9077 **-**



Classroom security holdback lock, interior/exterior lockdown



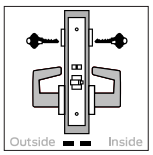
- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative by key from either side; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts latchbolt but cannot unlock outside lever
- Rotating inside lever retracts latchbolt; key inside retracts latchbolt and unlocks outside lever
- Rotate inside lever while turning key 360° to activate retracted latch holdback feature; to deactivate, reverse key rotation 360°
- Inside lever always free for immediate egress

Note: Outside lever remains inoperative until unlocked by key inside.

Note: Locks with holdback feature are not UL listed. Installation should be in accordance with existing codes only.

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9082 **F30**



Institution lock



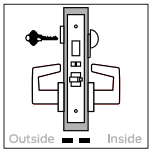
- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Both levers (or knobs) always fixed; Vandlgard® option allows both levers to rotate freely down while locked
- Key on either side retracts latchbolt

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

SINGLE CYLINDER DEADBOLT FUNCTIONS

Schlage **ANSI**
L/LV9453 **F20**



Entrance/office lock with deadbolt

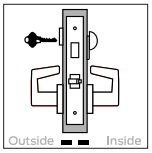


- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by key outside; rotating thumbturn 20° locks outside lever only; rotating thumbturn 90° also throws deadbolt; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts deadbolt and latchbolt, however, outside lever remains locked
- Rotating inside lever retracts deadbolt and latchbolt; outside lever unlocked when thumbturn is returned to vertical position
- Inside lever always free for immediate egress

Caution: Egress without fully rotating the thumbturn to vertical position can result in lock-out situations.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9456 **F13**
L/LV9456 with XL13-439 key override



Corridor lock with deadbolt

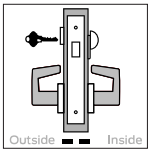


- Key cylinder outside; thumbturn inside; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by key outside or by inside thumbturn; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts deadbolt and unlocks outside lever; XL13-439 option allows key to retract deadbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L9460 with XL11-635 **-**



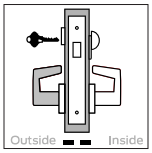
Cylinder x thumbturn deadbolt with fixed levers



- Key cylinder outside; thumbturn inside; deadbolt only
- Both levers (or knobs) always fixed
- Deadbolt thrown or retracted by key outside or by inside thumbturn

To order, specify function and note XL11-635 as a special option.

Schlage **ANSI**
L9460 with XL11-886 **-**



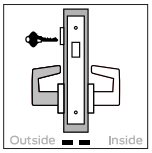
Cylinder x thumbturn deadbolt with inside active lever



- Key cylinder outside; thumbturn inside; deadbolt only
- Outside lever (or knob) always fixed; inside lever always active
- Deadbolt thrown or retracted by key outside or by inside thumbturn
- Rotating inside lever retracts deadbolt
- Inside lever always free for immediate egress

To order, specify function and note XL11-886 as a special option.

Schlage **ANSI**
L9464 with XL11-886 **-**



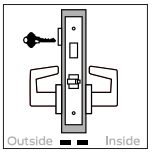
Single cylinder deadbolt with inside active lever



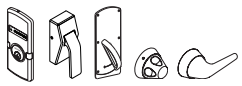
- Key cylinder outside with lever (or knob); lever only-inside; deadbolt only
- Outside lever always fixed; inside lever always active
- Deadbolt thrown or retracted by key outside
- Rotating inside lever retracts deadbolt
- Inside lever always free for immediate egress

To order, specify function and note XL11-886 as a special option.

Schlage **ANSI**
L9465 **-**



Closet/storeroom lock



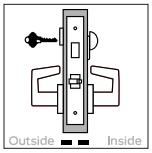
- Key cylinder outside with lever (or knob); lever only-inside; deadbolt and latchbolt
- Latchbolt retracted by lever from either side at all times
- Deadbolt thrown or retracted by key outside

Caution: Deadbolt locks with outside key retraction only can result in situations where occupants can be locked in.

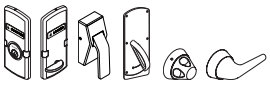
Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

SINGLE CYLINDER DEADBOLT FUNCTIONS

Schlage **ANSI**
L9473 **F21**



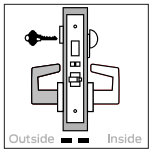
Dormitory/bedroom lock



- Key cylinder outside; thumbturn inside; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side at all times
- Deadbolt thrown or retracted by key outside or by inside thumbturn

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9480 **-**
L/LV9480 with XL13-439 key override



Storeroom lock with deadbolt

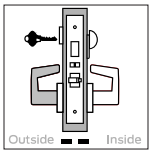


- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside lever (or knob) always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by key outside or by inside thumbturn
- Key outside retracts deadbolt and latchbolt, however, outside lever remains locked; XL13-439 option allows key to retract deadbolt and latchbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

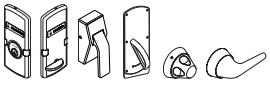
Note: Ligature-resistant trims not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L/LV9485 **-**
L/LV9485 with XL13-439 key override



Faculty/hotel restroom lock with deadbolt



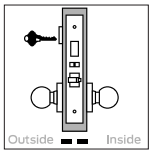
- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside lever (or knob) always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by rotating inside thumbturn
- Key outside retracts latchbolt but does not retract deadbolt unless using an emergency key (sold separately)
- Optional XL13-439 allows emergency key to retract deadbolt and latchbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

Note: Not available in SFIC or Everest SL formats.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L9485 with XL11-557 **-**



Prison function lock

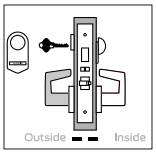
- Key cylinder outside with knob; knob only-inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside knob always free spinning; latchbolt retracted by inside knob
- Inside knob is made inoperative (fixed) when deadbolt is thrown by guard key outside
- Guard key outside retracts deadbolt and unlocks inside knob; in unlocked state use of prisoner's key outside retracts latchbolt only

Note: Available with knobs in rose or L escutcheon trim only. Tamper-resistant Torx screws standard.

To order, specify function and note XL11-557 as a special option.

SINGLE CYLINDER DEADBOLT FUNCTIONS

Schlage **ANSI**
L/LV9486 -
L/LV9486 with XL13-439 key override



Faculty/hotel restroom lock with chevron indicator



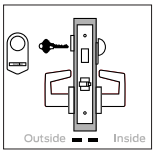
- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Outside lever (or knob) always fixed; latchbolt retracted by inside lever; Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by rotating inside thumbturn, when thrown-indicator message changes from blank to "DO NOT DISTURB"
- Key outside retracts latchbolt but does not retract deadbolt unless using an emergency key (sold separately)
- Optional XL13-439 allows emergency key to retract deadbolt and latchbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

Note: Not available in SFIC or Everest SL formats. Hospital latch trim not available with Vandlgard option.

To order with key override, specify function and note XL13-439 as a special option.

Available with A, B or C roses only; to order chevron indicator with "OCCUPIED" message specify L583-375.

Schlage **ANSI**
L/LV9496 -
L/LV9496 with XL13-439 key override



Corridor lock with chevron indicator

- Key cylinder outside; thumbturn inside; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by key outside or by inside thumbturn, when thrown-indicator message changes from blank to "OCCUPIED"; Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts deadbolt and unlocks outside lever; XL13-439 option allows key to retract deadbolt overriding thumbturn if being held in locked position
- Rotating inside lever retracts both deadbolt and latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

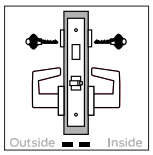
Note: Available in rose trim only.

To order with key override, specify function and note XL13-439 as a special option.

Adds chevron style occupancy indicator (09-611) to sectional trim lock with A or B roses only.

DOUBLE CYLINDER DEADBOLT FUNCTIONS

Schlage **ANSI**
L/LV9457 **F33**



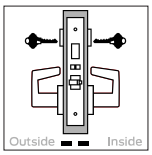
Classroom security lock with deadbolt



- Key cylinder both sides; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by key from either side; Vandlgard® option allows outside lever to rotate freely down while locked
- Key either side retracts both latchbolt and deadbolt and unlocks outside lever
- Rotating inside lever retracts both deadbolt and latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9458 **F34**



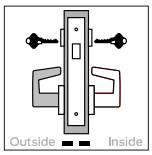
Classroom security lock with deadbolt and auxiliary latch



- Key cylinder both sides; deadbolt, latchbolt and deadlocking auxiliary latch
- Latchbolt retracted by lever (or knob) from either side
- Outside lever is made inoperative when deadbolt is thrown by key from either side; Vandlgard® option allows outside lever to rotate freely down while locked
- Key either side retracts both latchbolt and deadbolt and unlocks outside lever
- Rotating inside lever retracts both deadbolt and latchbolt and unlocks outside lever
- Inside lever always free for immediate egress

Note: Ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L9462 with XL11-886 **-**



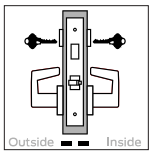
Double cylinder deadbolt with active inside lever



- Key cylinder both sides; deadbolt only
- Outside lever (or knob) always fixed; inside lever always active
- Deadbolt thrown or retracted by key from either side
- Rotating inside lever retracts deadbolt
- Inside lever always free for immediate egress

To order, specify function and note XL11-886 as a special option.

Schlage **ANSI**
L9466 **F14**



Utility room/ storeroom lock

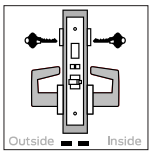


- Key cylinder both sides; deadbolt and latchbolt
- Latchbolt retracted by lever (or knob) from either side
- Deadbolt thrown or retracted by key from either side

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Schlage **ANSI**
L/LV9482 **-**



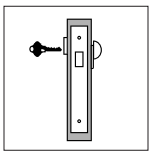
Institution lock with deadbolt

- Key cylinder both sides; deadbolt, latchbolt and deadlocking auxiliary latch
- Both levers always fixed; Vandlgard® option allows both levers to rotate freely down while locked
- Deadbolt thrown or retracted by key from either side
- Key on either side retracts both deadbolt and latchbolt

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

MORTISE DEADBOLT FUNCTIONS

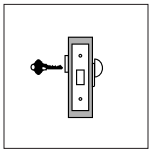
Schlage L9460 — **ANSI** F17



Cylinder x thumbturn mortise deadbolt



Schlage L460 — **ANSI** E06071



Cylinder x thumbturn small case mortise deadbolt

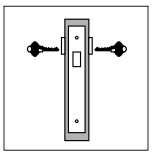


- Key cylinder only, no lever (or knob) outside; thumbturn only, no lever inside; deadbolt only
- Deadbolt thrown or retracted by key outside or by inside thumbturn

Note: L9000 mortise deadbolts available in L escutcheon or sectional trim only.

Note: L400 small case not available with escutcheon trim.

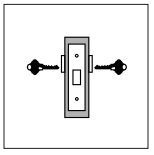
Schlage L9462 — **ANSI** F16



Double cylinder mortise deadbolt



Schlage L462 — **ANSI** E06061



Double cylinder small case mortise deadbolt



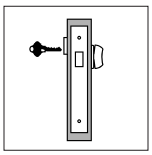
- Key cylinder both sides, no levers (or knobs); deadbolt only
- Deadbolt thrown or retracted by key from either side

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Note: L9000 mortise deadbolts available in L escutcheon or sectional trim only.

Note: L400 small case not available with escutcheon trim.

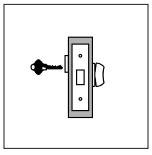
Schlage L9463 — **ANSI** F29



Cylinder x cylinder thumbturn mortise deadbolt



Schlage L463 — **ANSI** E06091



Cylinder x cylinder thumbturn small case mortise deadbolt

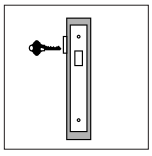


- Key cylinder only, no lever (or knob) outside; cylinder thumbturn only, no lever inside; deadbolt only
- Deadbolt thrown or retracted by key outside
- Rotating inside thumbturn retracts deadbolt but cannot project it

Note: L9000 mortise deadbolts available in L escutcheon or sectional trim only.

Note: L400 small case not available with escutcheon trim.

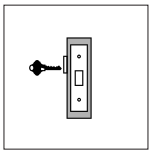
Schlage L9464 — **ANSI** F18



Cylinder only mortise deadbolt



Schlage L464 — **ANSI** E06081



Cylinder only small case mortise deadbolt

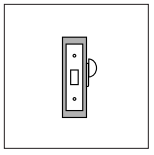


- Key cylinder only, no lever (or knob) outside; no interior trim; deadbolt only
- Deadbolt thrown or retracted by key

Note: L9000 mortise deadbolts available in L escutcheon or sectional trim only.

Note: L400 small case not available with escutcheon trim.

Schlage L480 — **ANSI** -



Thumbturn only small case mortise deadbolt

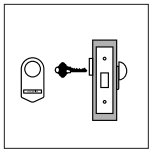


- No outside trim; thumbturn only, no lever inside; deadbolt only
- Deadbolt thrown or retracted by rotating inside thumbturn

Note: When ordered with indicator, the indicator is applied to the thumbturn side.

Note: L400 small case not available with escutcheon trim.

Schlage L496 — **ANSI** -

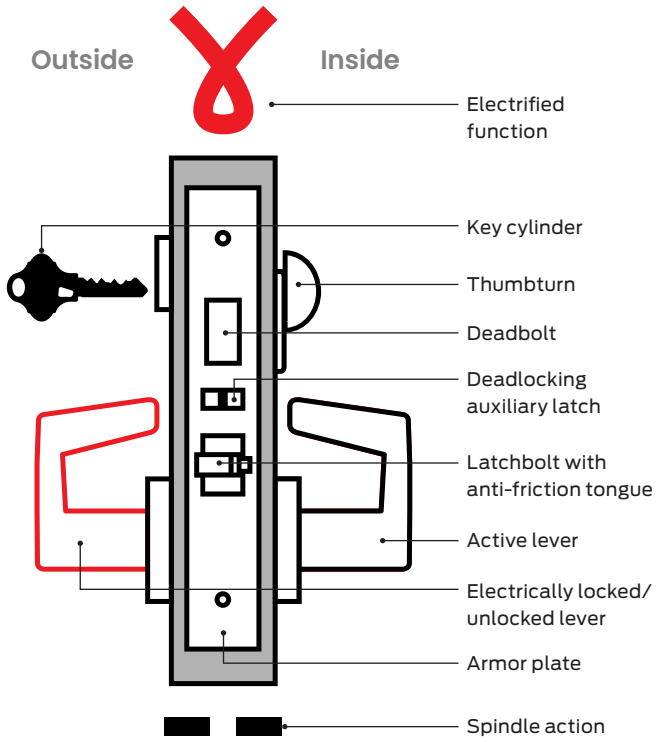


Cylinder x thumbturn small case mortise deadbolt with chevron indicator

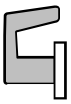
- Key cylinder only, no lever (or knob) outside; thumbturn only, no lever inside; deadbolt only
- Deadbolt thrown or retracted by key outside or by inside thumbturn, when thrown-indicator message changes from blank to "OCCUPIED"

WIRED ELECTRIFIED LOCK FUNCTIONS

Legend



Key


Fixed lever


Motorized latch retraction function

Solid spindle – connected lever movement

Two-piece spindle – independent lever movement


Hospital latch trim available


High-security ligature resistant trim available


Ligature-resistant lever trim available


Ligature-resistant knob trim available

Available electrified options include:

RX	Request to Exit
LX	Latch bolt monitor
DPS	Door Position Switch
DM	Deadbolt monitor (DM)

Product Identification Guide

LV9492EL with XL13-439

Lock series and function code
L = standard
LV = Vandlgard® option
LM = multi-latch
LMV = multi-latch with Vandlgard

0 = no lock case (dummy trim)
9 = functions with lock case

0 = no deadbolt
4 = with deadbolt
5 = with motorized latch retraction
6 = with motorized latch retraction and lever control

Function code

Electrified functions
EL = electrically locked
EU = electrically unlocked

Functions requiring special ordering nomenclature

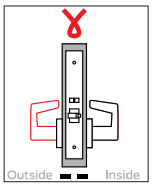


Vandlgard® feature helps protect the lock chassis from damage.

The Vandlgard optional feature available on many functions allows the outside lever to rotate freely down when in a locked state. This limits the ability of vandals to apply excessive force to the lever helping to prevent damage to internal components.

NON-KEYED ELECTRIFIED FUNCTIONS

Schlage **ANSI**
L/LV9090EL/EU **-**



Electrically locking/ unlocking outside lever, no cylinder



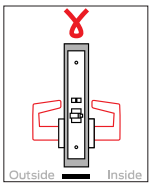
- Levers (or knobs) only both sides; latchbolt and deadlocking auxiliary latch
- Powered state: outside lever continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows outside lever to rotate freely down while locked
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode outside lever is locked
- Inside lever always free for immediate egress

Note: Auto detects 12 or 24V DC.

Note: Ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

Schlage **ANSI**
L/LV9091EL/EU **-**



Electrically locking/ unlocking both levers, no cylinder



- Levers (or knobs) only both sides; latchbolt and deadlocking auxiliary latch
- Powered state: both levers continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows both levers to rotate freely down while locked
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode both levers are locked

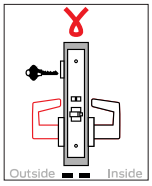
Note: Auto detects 12 or 24V DC.

Note: Ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

KEYED NON-DEADBOLT ELECTRIFIED FUNCTIONS

Schlage **ANSI**
L/LV9092EL/EU **-**



Electrically locking/ unlocking outside lever, outside cylinder



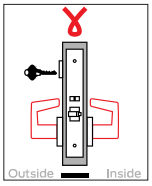
- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Powered state: outside lever continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows outside lever to rotate freely down while locked
- Key outside retracts latchbolt but cannot change the normal locked or unlocked state of outside lever
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode outside lever is locked
- Inside lever always free for immediate egress

Note: Auto detects 12 or 24V DC.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

Schlage **ANSI**
L/LV9093EL/EU **-**



Electrically locking/ unlocking both levers, outside cylinder



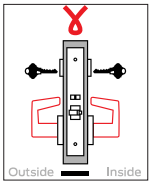
- Key cylinder outside with lever (or knob); lever only-inside; latchbolt and deadlocking auxiliary latch
- Powered state: both levers continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows both levers to rotate freely down while locked
- Key outside retracts latchbolt but cannot change the normal locked or unlocked state of either lever
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode both levers are locked

Note: Auto detects 12 or 24V DC.

Note: Ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

Schlage **ANSI**
L/LV9095EL/EU **-**



Electrically locking/ unlocking both levers, double cylinder



- Key cylinder both sides; latchbolt and deadlocking auxiliary latch
- Powered state: both levers (or knobs) continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows both levers to rotate freely down while locked
- Key on either side retracts latchbolt but cannot change the normal locked or unlocked state of levers
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode both levers are locked

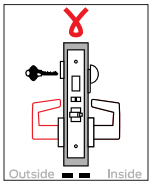
Note: Auto detects 12 or 24V DC.

Note: Hospital latch and ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

DEADBOLT ELECTRIFIED FUNCTIONS

Schlage **ANSI**
L/LV9492EL/EU -
L/LV9492EL/EU with XL13-439 key override



Electrically locking/unlocking outside lever, outside cylinder, inside thumbturn with deadbolt



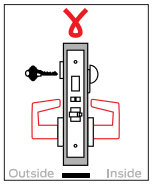
- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Powered state: outside lever (or knob) continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by key outside or by inside thumbturn; XL13-439 option allows key to retract deadbolt overriding thumbturn if being held in locked position
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode outside lever is locked; deadbolt projection is independent of electrically locked or unlocked state of outside lever
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

Note: Auto detects 12 or 24V DC; supplied deadbolt monitor allows option to prevent ingress with card use when deadbolt is thrown.

Note: Ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU. To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L/LV9493EL/EU -
L/LV9493EL/EU with XL13-439 key override



Electrically locking/unlocking both levers, outside cylinder, inside thumbturn with deadbolt



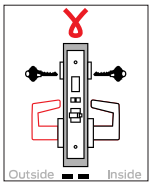
- Key cylinder outside; thumbturn inside; deadbolt, latchbolt and deadlocking auxiliary latch
- Powered state: both levers (or knobs) continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows both levers to rotate freely down while locked
- Deadbolt thrown or retracted by key outside or by inside thumbturn; XL13-439 option allows key to retract deadbolt overriding thumbturn if being held in locked position
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode both levers are locked; deadbolt projection is independent of electrically locked or unlocked state of either lever
- When unlocked, rotating inside lever retracts both deadbolt and latchbolt

Note: Auto detects 12 or 24V DC; supplied deadbolt monitor allows option to prevent ingress with card use when deadbolt is thrown.

Note: Ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU. To order with key override, specify function and note XL13-439 as a special option.

Schlage **ANSI**
L/LV9494EL/EU -



Electrically locking/ unlocking outside lever, double cylinder with deadbolt



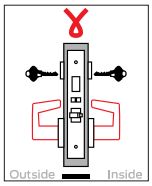
- Key cylinder both sides; deadbolt, latchbolt and deadlocking auxiliary latch
- Powered state: outside lever (or knob) continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows outside lever to rotate freely down while locked
- Deadbolt thrown or retracted by key from either side
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode outside lever is locked; deadbolt projection is independent of electrically locked or unlocked state of outside lever
- Rotating inside lever retracts both deadbolt and latchbolt
- Inside lever always free for immediate egress

Note: Auto detects 12 or 24V DC; supplied deadbolt monitor allows option to prevent ingress with card use when deadbolt is thrown.

Note: Ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

Schlage **ANSI**
L/LV9495EL/EU -



Electrically locking/ unlocking both levers, double cylinder with deadbolt



- Key cylinder both sides; deadbolt, latchbolt and deadlocking auxiliary latch
- Powered state: both levers (or knobs) continuously locked (EL mode) or unlocked (EU mode); Vandlgard® option allows both levers to rotate freely down while locked
- Deadbolt thrown or retracted by key from either side
- When power is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode both levers are locked; deadbolt projection is independent of electrically locked or unlocked state of either lever
- When unlocked, rotating inside lever retracts both deadbolt and latchbolt

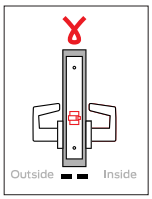
Note: Auto detects 12 or 24V DC; supplied deadbolt monitor allows option to prevent ingress with card use when deadbolt is thrown.

Note: Ligature-resistant trims not available with Vandlgard option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

MOTORIZED LATCH RETRACTION FUNCTIONS

Schlage **ANSI**
L9510 **-**

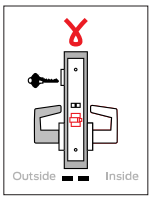


Passage latch with motorized latch retraction

- Lever only both sides; latchbolt only
- Extended latchbolt is retracted by lever from either side at all times
- Powered state: latchbolt is retracted
- When power is removed latchbolt extends
- Inside lever always free for immediate egress

Note: 24V DC only. Available options include Request to Exit (RX) or Latchbolt Monitor (LX).

Schlage **ANSI**
L9580 **-**

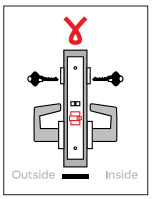


Storeroom lock with motorized latch retraction

- Key cylinder outside with lever; lever only-inside; latchbolt and deadlocking auxiliary latch
- Outside lever always fixed; extended latchbolt is retracted by inside lever
- Key outside retracts latchbolt
- Powered state: latchbolt is retracted
- When power is removed latchbolt extends
- Inside lever always free for immediate egress

Note: 24V DC only. Available options include Request to Exit (RX) or Latchbolt Monitor (LX).

Schlage **ANSI**
L9582 **-**



Institution lock with motorized latch retraction

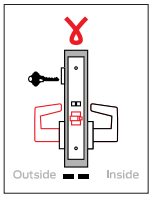
- Key cylinder and lever both sides; latchbolt and deadlocking auxiliary latch
- Both levers always fixed
- Key on either side retracts latchbolt
- Powered state: latchbolt is retracted
- When power is removed latchbolt extends

Caution: Double cylinder locks on any door, in any structure which is used for egress are a life safety hazard in times of emergency and their use is not recommended. Installation should be in accordance with existing codes only.

Note: 24V DC only. Available Latchbolt Monitor (LX) option.

MOTORIZED LATCH RETRACTION FUNCTIONS WITH LEVER CONTROL

Schlage **ANSI**
L9692EL/EU **-**



Electrically locking/ unlocking outside lever, outside cylinder with motorized latch retraction

- Key cylinder outside with lever; lever only-inside; latchbolt and deadlocking auxiliary latch

Lever control

- Powered state: outside lever continuously locked (EL mode) or unlocked (EU mode)
- When power for lever is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode outside lever is locked

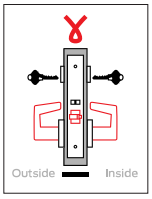
Independent latchbolt control

- Powered state: latchbolt is retracted
- When power is removed latchbolt extends
- Key outside retracts latchbolt but cannot change the normal locked or unlocked state of outside lever
- Inside lever always free for immediate egress

Note: 24V DC only. Available options include Request to Exit (RX) or Latchbolt Monitor (LX).

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

Schlage **ANSI**
L9695EL/EU **-**



Electrically locking/ unlocking both levers double cylinder with motorized latch retraction

- Key cylinder and lever both sides; latchbolt and deadlocking auxiliary latch

Lever control

- Powered state: both levers continuously locked (EL mode) or unlocked (EU mode)
- When power for levers is removed (or power fails): in EL mode either lever will retract latchbolt; in EU mode both levers are locked

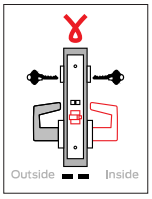
Independent latchbolt control

- Powered state: latchbolt is retracted
- When power is removed latchbolt extends
- Key either side retracts latchbolt but cannot change the normal locked or unlocked state of either lever

Note: 24V DC only. Available options include Request to Exit (RX) or Latchbolt Monitor (LX).

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

Schlage **ANSI**
L9696EL/EU **-**



Electrically locking/ unlocking inside lever double cylinder with motorized latch retraction

- Key cylinder and lever both sides; latchbolt and deadlocking auxiliary latch

Lever control

- Powered state: inside lever continuously locked (EL mode) or inside lever unlocked (EU mode); outside lever always fixed
- When power for lever is removed (or power fails): in EL mode inside lever will retract latchbolt; in EU mode inside lever is locked; outside lever always fixed

Independent latchbolt control

- Powered state: latchbolt is retracted
- When power is removed latchbolt extends
- Key either side retracts latchbolt but cannot change the normal locked or unlocked state of either lever

Note: 24V DC only. Available Latchbolt Monitor (LX) option.

Ordering: Case-mounted switch allows field selectable EL/EU setting however, when ordering, please specify EL or EU.

CYLINDERS

Conventional mortise cylinder options	
P6	6-pin cylinder (default) with Schlage logo
P	6-pin cylinder, keyed 5
Z	Everest SL cylinder, 7-pin (A2 pinning) with Schlage logo
L	Less conventional cylinder
C6	Concealed mortise, 6-pin
C	Concealed mortise, 6-pin cylinder, keyed 5
W	Less concealed mortise cylinder

Full size interchangeable core (FSIC) mortise cylinder options	
R	6-pin FSIC with Schlage logo
M	Everest SL FSIC, 7-pin (A2 pinning) with Schlage logo
J	Less FSIC
F	6-pin FSIC less Schlage logo
T	Refundable FSIC construction core

Small format interchangeable core (SFIC) mortise cylinder options	
G	7-pin SFIC (A2 pinning) with Schlage logo
B	Less SFIC
BDC	Disposable SFIC construction core
H	Refundable SFIC construction core

SPECIFICATIONS

Chassis	
Case material	Cold Rolled Steel (CRS) with zinc dichromate plating
Case size	L9000 Series: 4-7/16" x 6-1/16" x 1" (113 mm x 154 mm x 25 mm) L400 Series: 4-7/16" x 3-5/8" x 1" (113 mm x 92 mm x 25 mm)
Spacing	Knob or lever to cylinder: 3-7/8" (98 mm); Knob or lever to thumbturn hub: 2-11/16" (68 mm)
Door thickness	Standard: 1-3/4" (44 mm) Optional: 1-3/8" (35 mm) Over 1-3/4" (44 mm) specify door thickness and position in door EE, EI, EO, ED
Backset	2-3/4" (70 mm) only

Trim	
Handing	L9000 Series: Field-reversible without disassembly L400 Series: Non-handed
Lever/knob	**33 lever designs (see pages 2-5):** Forged brass and cast stainless steel **Two knob designs (see page 5):** Heavy-duty wrought brass or stainless steel Ligature resistant lever (SL1) and knob (SK1), High Security Ligature Resistant (HSLR) trim, HL6 hospital latch Tactile warning applied to outside lever; available on 01, 02, 03, 05, 06, 07, 12, 17, 18, M51, M52, M81, ME1, ME2, ME3 lever designs
Rose/ escutcheon	L escutcheons: 7-15/16" x 1-3/4" x 7/16" (202 mm x 44 mm x 11 mm); cold-forged brass and stainless steel N escutcheons: 7-7/8" x 2-1/2" x 7/16" (200 mm x 64 mm x 11 mm); heavy-wrought, reinforced brass and stainless steel Roses: A, B, C: wrought brass and stainless steel; AVA and MER: forged brass
Finishes	14 available: 605, 606, 609, 612, 613, 619, 622, 625, 626, 626AM, 643e
Combinations	Available with knob both sides, lever both sides, or knob/lever combinations. Roses cannot be combined with escutcheons.

Latches, Armors, & Strikes	
Armor	**L9000 Series:** Standard: 1-1/4" x 8" x 7/32" (32 mm x 203 mm x 6 mm) Optional: 1-1/16" x 8" x 7/32" (27 mm x 203 mm x 6 mm) **L400 Series:** Standard: 1-1/4" x 5-9/16" x 7/32"(32 mm x 141 mm x 6 mm)
Latch	3/4" (19 mm) throw stainless steel latch with anti-friction tongue
Deadbolt	1" (25 mm) throw stainless steel deadbolt
Strike	**L9000 Series:** Standard: ANSI curved lip strike 1-1/4" x 4-7/8" (32 mm x 124 mm) x 1-3/16" (30 mm) lip with dust box; Optional: Extended lip strike options (7/8", 1", 1-1/2", 1-3/4", 2") **L400 Series:** Standard: 1-1/8" x 3-1/2" (29 mm x 89 mm) with dust box; Optional: 1-1/4" x 4-7/8" (32 mm x 124 mm) with dust box

Keying	
Cylinder format	6-pin Conventional mortise cylinder (standard); also available in concealed mortise cylinder, FSIC, SFIC and 7-pin SL cylinder formats plus less cylinder options. Two nickel silver cut keys per lock.
Keyway	Patented Everest 29 S123 (standard); also available in open, restricted, and Primus XP security levels with available master keying and construction keying.

SPECIFICATIONS

Wired electrified	
Input voltage	12V or 24V DC (24V DC only on motorized latch retraction functions)
Operating mode	Fail Safe or Fail Secure via switch on chassis (except L9510, L9580, and L9582)
Peak current	12V operating voltage: 1A 24V operating voltage: 0.4A (2.0A for locks with motorized latch retraction)
Holding current	0.1 amp
Request to Exit	Modular option on L909X and L949X electrified functions and on L95XX and L969X latch retraction functions except L9582 and L9696 (when ordering or added in field) Rating: 3A @ 125V AC/2A @ 30V DC Also available option for the following mechanical functions: L9010/25/26/50/56/70/71/80 and L9453/56/58/65/66/80/85/96.
Latch bolt monitor	Available on all L909X and L949X electrified functions, L95XX and L969X latch retraction functions, L9010/25/26/50/56/70/71/80/82 and L9453/56/65/66/80/85/96 mechanical functions
Door position sensor	Internal available on L909x electrified and L9010/25/26/80/82 mechanical functions; external available on all functions
Deadbolt monitor	Standard on L949x electrified and available on L9453/56/57/58/80/85/96 mechanical functions

Warranty	
	10-year limited mechanical and 3-year limited electromechanical

Certifications	
ANSI/BHMA	**L/LV9000:** ANSI/BHMA A156.13-2017 Series 1000, Grade 1 Operational and Security **With FSIC Interchangeable Core Cylinders:** Grade 1 Operational, Grade 2 Security **With SFIC Interchangeable Core Cylinders:** Grade 1 Operational, Grade 3 Security **L400:** ANSI/BHMA A156.36-2010, Grade 1
ICC	Complies with ICC A117.1 Accessible and Usable Buildings and Facilities
UL/cUL	UL 10C and CAN/ULC-S104 3-hour fire door (except L9076 and L9077) Electrified functions are UL/ULC Listed for single-point locking applications UL 437 Listed when using UL 437 Primus cylinder UL Listed for 3-Hour fire door (except L9076 and L9077) L400 UL Listed Auxiliary Lock for 3-hour fire door
UL 294	UL 294 Access Control Performance Levels: Destructive Attack, Level 1; Line Security, Level 1; Standby Power, Level 1; Endurance, Level IV (with DM, or LX, Endurance, Level I). ULC-S319 Class III (L909x and L949x functions only)
CA Fire Code	All levers with a return to door of 1/2" (13 mm) or less comply (Formerly Title 19, California State Fire Marshal Standard)
Building codes	Miami-Dade NOA and Florida Building Commission listings Texas Department of Insurance (TDI) for impact and non-impact applications
Federal	BAA compliant, all functions

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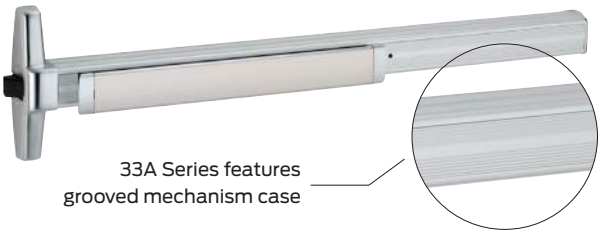
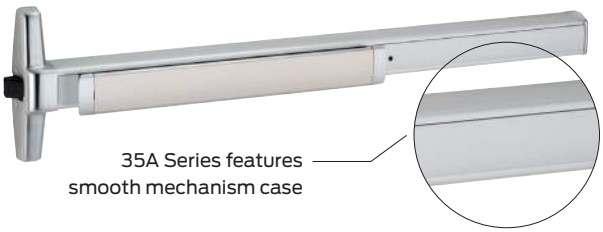
VON DUPRIN®

Exit devices

33A/35A Series





Overview

The 33A/35A Series is a narrow stile push pad device popular for its vast application coverage. With many field configurable and upgradeable solutions available, it's easy to enhance the functionality of an existing device. Mechanical and electronic options include quiet electric latch retraction, delayed and controlled egress, concealed vertical cables and security indicators. It's one way Von Duprin® protects its customers' investments long into the future.

Device types



Rim device



27A Surface mounted vertical rod device [1]



47A Concealed vertical rod device, 5/8" throw[1]
48A Concealed vertical rod device, 5/8" top, 1 1/2" bottom throw



49A Concealed vertical cable device [2]



50AWDC Concealed vertical cable wood door device

[1] Also available less bottom rod (LBR)
[2] Also available less bottom latch (LBL)

ALLEGION™

Finishes



605
Bright Brass



606
Satin Brass



612
Satin Bronze



619
Satin Nickel



622
Matte Black

625
Bright Chrome



626
Satin Chrome



626AM
Satin Chrome, Antimicrobial



628
Aluminum, Clear Anodized



630
Satin Stainless



630AM
Satin Stainless, Antimicrobial



643e
Aged Bronze



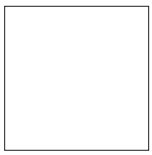
693
Black



710
Dark Brown, Anodized

Due to the many variations in monitors and printers, color samples may appear different than the physical product. Contact your local sales representative for a physical color sample.

Trim functions



EO No outside trim

- Exit only



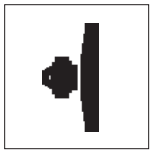
DT Dummy trim

- Pull when dogged (not recommended for fire device)



NL Night latch

- Key retracts latchbolt
- Rim cylinder



NLOP Night latch

- Key retracts latchbolt, optional pull required



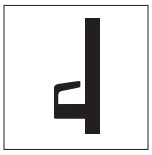
L Lever

- Key locks and unlocks
- 1 ¼" mortise cylinder
- Handed, reversible lever
- Electrified lever operation available



LBE Lever, blank escutcheon

- Always operable (no cylinder)



NLOP Night latch, operational pull

- Key retracts latchbolt, pull required



TP Thumbpiece

- Key locks and unlocks
- 1-1/4" mortise cylinder



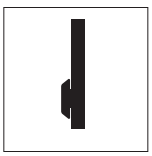
TLBE Turn lever, blank escutcheon

- Blank escutcheon always operable (no cylinder)



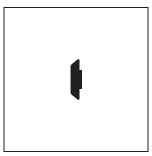
TL Turn lever

- Key locks and unlocks (use with DT trim)
- 1 ¼" mortise cylinder



TLBE Turn lever, blank escutcheon

- Blank escutcheon always operable (no cylinder, use with DT trim)



TLOP Turn lever, optional pull

Trim styles


386


388


360L


360T


374T x 386DT


374T/376T x 8190 10"


388 x 550DT


360T x 550DT


388 x 8190 10"


360T x 8190 10"


392-6

Trim styles

Dimensions

Trim style	Base width	Base height	Projection	Grip width	Grip height
386/ 386DT	1 5/8"	7 15/32"	2 7/16"	4 5/16"	8 1/2"
388	1 11/16"	7 15/32"	1"		
360L	1 11/16"	7 1/2"	3"		
360T	1 11/16"	7 1/2"	1 13/16"		
374T	1 11/16"	7 1/2"			
376T	1 11/16"	7 1/2"	1 13/16"		
550DT	3 5/8"	11 9/16" (10" center to center)	1 7/8"		
8190 10"	3 1/4"	11"	3 1/4"		
392-6	3 1/2"	7" (6 1/4" center to center)	2 1/4"		

Lever styles

Decorative levers



M51
- Knurling available



M52
- Knurling available



M53



M54



M55



M56



M57[1]



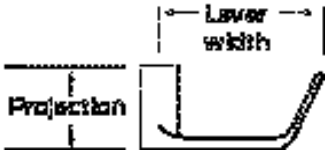
M61
- Handed



M62[1]
- Handed

Dimensions

Lever	Width	Projection
M51	4.5"	2.5"
M52	4.5"	2.4"
M53	4.4"	2.4"
M54	4.4"	2.3"
M55	4.4"	2.7"
M56	4.5"	2.3"
M57	4.5"	2.7"
M61	4.5"	2.7"
M62	4.6"	2.4"



[1] Available in stainless steel substrate only

Lever styles

Decorative levers



M63
- Handed



M81
- Knurling available



M82



M83



M84



M85
- Handed



ME1[1]
- Handed



ME2[1]
- Handed



ME3[1]

Dimensions

Lever	Width	Projection
M63	4.6"	2.6"
M81	4.8"	2.5"
M82	4.9"	2.5"
M83	4.7"	2.25"
M84	5.1"	2.2"
M85	4.9"	2.7"
ME1	5.4"	2.6"
ME2	5.2"	2.4"
ME3	5"	2.8"



[1] Designed with Gensler as product design consultant

Lever styles

Standard levers



01



02
- Knurling available



03
- Knurling available



05



06
- Default lever
- Suites with Schlage Rhodes
- Knurling available



07
- Suites with Schlage Athens



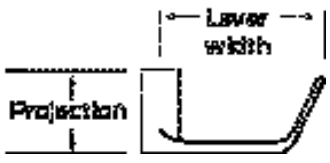
12
- Handed



16
- Suites with Schlage Omega

Dimensions

Lever	Width	Projection
01	4.0"	2.1"
02	4.75"	2.3"
03	4.75"	2.813"
05	3.75"	2.8"
06	4.7"	2.1"
07	4.6"	2.3"
12	4.3"	2.9"
16	5.05"	2.66"



Lever styles

Standard levers



17
- Suites with Schlage Sparta
- Knurling available



18



Accent (ACC)
- Handed



Asti (AST)
- Handed



Merano (MER)
- Handed



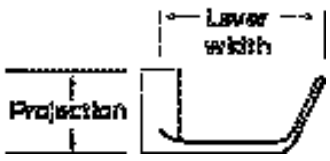
Latitude (LAT)



Longitude (LON)

Dimensions

Lever	Width	Projection
17	4.7"	2.3"
18	4.75"	2.4"
Accent (ACC)	4.4"	3.1"
Asti (AST)	4.2"	2.5"
Merano (MER)	4.1"	2.5"
Latitude (LAT)	4.6"	2.3"
Longitude (LON)	4.9"	2.3"



Electromechanical device options

Switches

LX **Latchbolt monitoring**

LX-LC **Latchbolt monitoring, low current**
- Signals use of an opening
- SPDT switch to monitor latch bolt
- 2 A maximum @ 24VDC; below 50 mA @ 24VDC for low current option

RX **Request to exit**

RX-LC **Request to exit - low current**

RX-2 **Double request to exit - 2 RX switches**

WP-RX **Waterproof request to exit**
- Signals use of an opening
- SPDT switch to monitor pushpad
- 2 A maximum @ 24VDC; below 50 mA @ 24VDC for low current option

LX-RX **Request to exit/latchbolt monitoring combination**

LX-RX-LC **Request to exit/latchbolt monitoring combination, low current**
- 2 A maximum @ 24VDC; below 50 mA @ 24VDC for low current option

SS **Signal switch**
- Monitors pushpad and latchbolt
- Signals unauthorized use of an opening
- Switch makes latch bolt tamper-resistant
- Up to 2.0 A @ 24VDC

Latch retraction

QEL **Quiet electric latch retraction**

QEL-L **Quiet electric latch retraction - Latchbolt Only**

HD-QEL **Quiet electric latch retraction with hex dogging**
- Bolt retraction via switch
- Converts exit door to push-pull operation
- Voltage: 24VDC
- Current: 1.0 A inrush (0.5 sec.) / 0.14 A holding

Delayed egress

CX **Chexit delayed exit**
- Meets NFPA 101 requirements
- Self-contained controls, locking, alarm
- Input voltage: 24VDC
- Input current inrush: 1.25 A
- Input current holding: 390 mA
- Alarm relay and secure relay contact ratings: 24 VDC, 1 A

CX-RCM **Chexit remote module**
- Chexit for smaller doors that can not accommodate a standard Chexit device
- Size: 3.75” x 5.57” x 2.50”
- Input voltage: 24VDC
- Input current inrush: 1.25A
- Input current holding: 390mA
- Alarm relay and secure relay contact ratings: 24 VDC, 1 A

Miscellaneous

ALK **Alarm exit kit**
- Unauthorized opening triggers 85-decibel horn
- Set in armed or disarmed mode by key
- Assembly includes both a 24VDC input and external inhibit

ESL **Emergency Secure Lockdown**

CON **Allegion Connect**
- Common connectors to connect various door hardware all the way to the power supply

E360 **Electric locking and unlocking trim**
- Remains latched while unlocked
- Remote electrical control
- Voltage: 24VDC (Continuous Duty)
- Current: 0.22 amps

Electromechanical device options

Matrix shows available options per device type but does not represent compatibly across multiple options.

	Switches									Latch retraction			Delayed egress		Misc			
	LX	LX-LC	RX	RX-LC	RX-2	WP-RX	LX-RX	LX-RX-LC	SS	QEL	QEL-L	HD-QEL	CX	CX-RCM	ALK	CON	E360	ESL[2]
33A 35A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
33A-F 35A-F	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
3327A 3527A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3327A-F 3527A-F	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
3347A 3547A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3347A-F 3547A-F	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
3348A 3548A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3348A-F 3548A-F	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
3349A 3549A	■[1]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3349A-F 3549A-F	■[1]	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■
3350AWDC 3550AWDC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3350AWDC-F 3550AWDC-F	■	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■

[1]For 3349A/3549A devices, LX switch monitors trim input or electric dogging of EL/QEL devices. LX switch does not monitor latchbolt condition.

[2]ESL product must be used in conjuction with a QEL device.

Mechanical device options

Dogging

CD — **Cylinder dogging, panic only**

LD — **Less dogging**

CDSI — **Cylinder dogging with indicator**
- Provides visible lock/unlock indicators showing whether device is dogged or undogged

HDSI — **Hex dogging with indicator**
- Provides visible lock/unlock indicators showing whether device is dogged or undogged

Environmental

PN — **Pneumatic latch retraction**
- For areas where electrical devices banned
- Special linkage for mechanical or pneumatic dogging

QM — **Quiet mechanical option**
- Provides damper-controlled relatching of device

INS — **Insulclad kits**
- Kits with longer fasteners or parts for Insulclad doors

AM — **Anti-microbial finish**

Weatherized

WH — **Weep holes**
- Drainage (weep) holes in mechanism case

California code

AX — **Accessible device**
- UL certified to meet new 5 lb. maximum operating force requirement
- Exceeds ANSI/BHMA requirements

Latches

PL — **Pullman latch**
- Latches are always extended
- Most commonly used in conjunction with electric strikes and LBR-less bottom rod application

Touch bar trim

RSS — **Red silk screen**
- Red silk-screened lettered touchbar trim

PUSH — **PUSH**
- Touchbar trim embossed PUSH

SG — **Safety glow**
- Self-illuminating touchpad
- Glows brightly during low or no light conditions

KN — **Knurled touchbar**
- Tactile warning applied to device

BRAILLE — **Braille**
- Vision impaired touchpad
- Raised letter and Braille

Mechanical device options

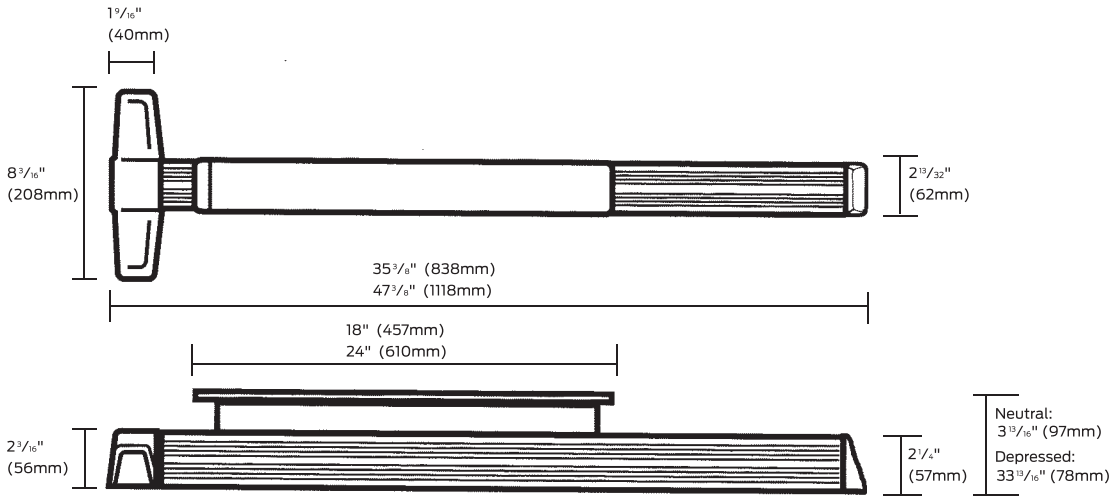
Matrix shows available options per device type but does not represent compatibly across multiple options.

	Dogging				Environmental				Weatherized	CA code	Latches	Touch bar trim				
	CD	LD	CDSI	HDSI	PN	QM	INS	AM	WH	AX	PL	RSS	PUSH	SG	KN	BRAILLE
35A 33A	■	■	■	■	■	■		■	■	■		■	■	■	■	■
35A-F 33A-F					■	■		■	■	■		■	■	■	■	■
3527A 3327A	■	■	■	■	■	■		■	■		■	■	■	■	■	■
3527A-F 3327A-F					■	■		■	■			■	■	■	■	■
3547A 3347A	■	■	■	■	■		■	■	■		■	■	■	■	■	■
3547A-F 3347A-F					■			■	■			■	■	■	■	■
3548A 3348A	■	■	■	■	■			■	■			■	■	■	■	■
3548A-F 3348A-F					■			■	■			■	■	■	■	■
3549A 3349A	■	■	■	■	■		■	■	■	■ LBL		■	■	■	■	■
3549A-F 3349A-F					■			■	■	■ LBL		■	■	■	■	■
3550A-WDC 3350A-WDC	■	■	■	■	■			■	■			■	■	■	■	■
3550A-WDC-F 3350A-WDC-F					■			■	■			■	■	■	■	■

Specifications

Accessibility	▪ Force to depress push pad – AX device: 5 lbs – Standard device: 15 lbs ▪ Push pad projection – Neutral: 3 13/16" (97 mm) – Depressed: 3 1/16" (78 mm)
Certifications/ approvals	All Von Duprin 33A and 35A exit devices are ANSI/BHMA Certified. Please refer to the BHMA Certified Products Directory for specific listings.
Mounting height	39 13/16" (1011 mm) 39 11/16" (1008 mm) with mullion
Warranty	36 months from the date of placing the product in operation

Dimensions



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Standard trim

	EO	DT	NL	NL-OP
	No outside trim Exit only	 **Dummy trim** Pull when dogged	 **Night latch** Key retracts latchbolt	 **Night latch** Key retracts latchbolt optional pull required
Product description	33A-EO 35A-EO	33A-DT 35A-DT	33A-NL 35A-NL	33A-NL-OP 35A-NL-OP
Trim description	—	386DT	386NL	388
Base size	—	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 5/8" (190x41mm)	7 1/2" x 1 11/16" (190x43mm)
Grip size	—	8 1/2" x 4 5/16" (216x110mm)	8 1/2" x 4 5/16" (216x110mm)	—
Projection	—	2 7/16" (62mm)	2 7/16" (62mm)	1" (25mm)
ANSI function	01	02	03	03
Cylinder type	—	—	Rim	Rim
Handing	—	—	Handed	—
Optional trim	—	x360L-DT x550DT x IVES 8190	—	x550DT x IVES 8190 10"

	L	L-BE	T	T-BE
	 **Lever** Key Locks and Unlocks	 **Lever Blank Escutcheon** Always Operable (No Cylinder)	 **Thumbturn** Key Locks and Unlocks	 **Thumbturn** Always Operable (No Cylinder)
Product description	33A-L 35A-L	33A-L-BE 35A-L-BE	33A-T 35A-T	33A-T-BE 35A-T-BE
Trim description	360L	360L-BE	360T	360T-BE
Base size	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)
Grip size	—	—	—	—
Projection	3" (76mm)	3" (76mm)	1 13/16" (46mm)	1 13/16" (46mm)
ANSI function	08 or 09 field selectable	—	11 or 12 field selectable	—
Cylinder type	1 1/4" Mortise	—	1 1/4" Mortise	—
Handing	Handed/Reversible	Handed/Reversible	—	—
Optional trim	—	E360L-BE	—	E360T-BE

Note: 360L & 360T used on wood door require the 33A-WDA cover plate

Notes

Standard trim

	EO **Exit only** no outside trim	DT  **Dummy trim** pull when dogged	NL  **Night latch** key retracts latchbolt	NL-OP  **Night latch** key retracts latchbolt optional pull required	TL  **Thumbturn** key locks & unlocks
Product description	3327A-EO 3527A-EO	3327A-DT 3527A-DT	3327A-NL 3527A-NL	3327A-NL-OP 3527A-NL-OP	3327A-TL 3527A-TL
Trim description	—	386DT	386NL	388	374T x 386
Base size	—	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 5/8" (190x41mm)	7 1/2" x 1 11/16" x 7/8" (190x43mmx22mm)
Grip size	—	8 1/2" x 4 5/16" (216x110mm)	8 1/2" x 4 5/16" (216x110mm)	—	—
Projection	—	2 7/16" (62mm)	2 7/16" (62mm)	1" (25mm)	1 13/16" (46mm)
ANSI function	01	02	03	03	11-12 field selectable
Cylinder type	—	—	Rim	Rim	1 1/4" Mortise
Handing	—	—	Handed	—	—
Optional trim	—	x 360L-DT x 550DT x IVES 8190	—	x 550DT x IVES 8190 10"	x 392-6

	TL-BE  **Thumbturn-blank** escutcheon always operable (no cylinder)	L  **Lever** key locks and unlocks	L-BE  **Lever blank escutcheon** always operable (no cylinder)	T  **Thumbturn** key locks and unlocks	T-BE  **Thumbturn** always operable (no cylinder)
Product description	3327A-TL-BE 3527A-TL-BE	3327A-L 3527A-L	3327A-L-BE 3527A-L-BE	3327A-T 3527A-T	3327A-T-BE 3527A-T-BE
Trim description	374T-BE x 386	360L	360L-BE	360T	360T-BE
Base size	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)
Grip size	8 1/2" x 4 5/16" (216x110mm)	—	—	—	—
Projection	1 13/16" (46mm)	3" (76mm)	3" (76mm)	1 13/16" (46mm)	1 13/16" (46mm)
ANSI function	—	08 or 09 field selectable	—	11 or 12 field selectable	—
Cylinder type	—	1 1/4" Mortise	—	1 1/4" Mortise	—
Handing	—	Handed/Reversible	Handed/Reversible	—	—
Optional Trim	x 392-6	—	E360L-BE	—	E360T-BE

Note: 360L & 360T used on wood door require the 33A-WDA cover plate 374T used on wood door require #10-WDA cover plate

Notes

Standard trim

	EO **Exit only** no outside trim	DT  **Dummy trim** pull when dogged	NL  **Night latch** key retracts latchbolt	NL-OP  **Night latch** key retracts latchbolt optional pull required	TL  **Thumbturn** key locks & unlocks
Product description	3347A-EO 3547A-EO	3347A-DT 3547A-DT	3347A-NL 3547A-NL	3347A-NL-OP 3547A-NL-OP	3347A-TL 3547A-TL
Trim description	—	386DT	386NL	388	376T x 386
Base size	—	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 11/16" (190x43mm)	7 1/2" x 1 11/16" x 7/8" (190x43mmx22mm)
Grip size	—	8 1/2" x 4 5/16" (216x110mm)	8 1/2" x 4 5/16" (216x110mm)	—	8 1/2" x 4 5/16" (216x110mm)
Projection	—	2 7/16" (62mm)	2 7/16" (62mm)	1" (25mm)	1 13/16" (46mm)
ANSI function	01	02	03	03	11-12 field selectable
Cylinder type	—	—	Rim	Rim	1 1/4" Mortise
Handing	—	—	Handed	—	—
Optional trim	—	x 360L-DT x 550DT x IVES 8190	—	x 550DT x IVES 8190 10"	x 392-6

	TL-BE  **Thumbturn-blank** escutcheon always operable (no cylinder)	L  **Lever** key locks and unlocks	L-BE  **Lever blank escutcheon** always operable (no cylinder)	T  **Thumbturn** key locks and unlocks	T-BE  **Thumbturn** always operable (no cylinder) (behind C/Case)
Product description	3347A-TL-BE 3547A-TL-BE	3347A-L 3547A-L	3347A-L-BE 3547A-L-BE	3347A-T 3547A-T	33477A-T-BE 35477A-T-BE
Trim description	376T-BE x 386	360L	360L-BE	360T	360T-BE
Base size	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)
Grip size	8 1/2" x 4 5/16" (216x110mm)	—	—	—	—
Projection	2 7/16" (62mm)	3" (76mm)	3" (76mm)	1 13/16" (46mm)	1 13/16" (46mm)
ANSI function	—	08 or 09 field selectable	—	11 or 12 field selectable	—
Cylinder type	—	1 1/4" Mortise	—	1 1/4" Mortise	—
Handing	—	Handed/Reversible	Handed/Reversible	—	—
Optional trim	x 392-6	—	E360L-BE	—	E360T-BE

Note: 360L & 360T used on wood door require the 33A-WDA cover plate 374T used on wood door require #10-WDA cover plate

Notes

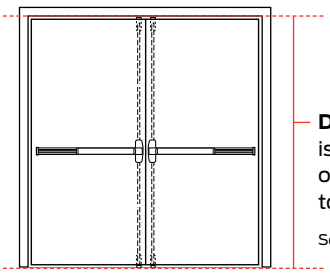
Standard trim

	EO **Exit only** no outside trim	DT  **Dummy trim** pull when dogged	NL  **Night latch** key retracts latchbolt	NL-OP  **Night latch** key retracts latchbolt optional pull required
Product description	3349A-EO 3549A-EO	3349A-DT 3549A-DT	3349A-NL 3549A-NL	3349A-NL-OP 3549A-NL-OP
Trim description	—	386DT	386NL	388
Base size	—	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 11/16" (190x43mm)
Grip size	—	8 1/2" x 4 5/16" (216x110mm)	8 1/2" x 4 5/16" (216x110mm)	—
Projection	—	2 7/16" (62mm)	2 7/16" (62mm)	1" (25mm)
ANSI function	01	02	03	03
Cylinder type	—	—	Rim	Rim
Handing	—	—	Handed	—
Optional trim	—	x 360L-DT x 550DT x IVES 8190	—	x 550DT x IVES 8190 10"

	L  **Lever** key locks and unlocks	L-BE  **Lever blank escutcheon** always operable (no cylinder)	T  **Thumbturn** key locks and unlocks (behind C/case)	T-BE  **Thumbturn** always operable (no cylinder) (behind C/case)
Product description	3349A-L 3549A-L	3349A-L-BE 3549A-L-BE	3349A-T 3549A-T	3349A-T-BE 3549A-T-BE
Trim description	360L	360L-BE	360T	360T-BE
Base size	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)
Grip size	—	—	—	—
Projection	3" (76mm)	3" (76mm)	1 13/16" (46mm)	1 13/16" (46mm)
ANSI function	08 or 09 field selectable	—	11 or 12 field selectable	—
Cylinder type	1 1/4" Mortise	—	1 1/4" Mortise	—
Handing	Handed/Reversible	Handed/Reversible	—	—
Optional trim	—	E360L-BE	—	E360T-BE

Nominal door opening height		Top cable part number	Bottom cable part number
***82" - 96"**	***6'10" - 8'**	**47250175**	**47250178**
>96" - 110"	>8'0" - 9' 2"	47250176	47250179
>110" - 120"	>9'2" - 10'	47250177	47250180

*Default door opening height. Specify door opening height if other than the default. For door heights less than 6'10" and greater than 10', contact our Customer Care department to discuss your specific application needs.



Door opening height
is distance from bottom of frame header to finished floor.

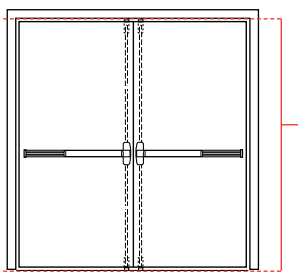
See table on left for standard offering.

Standard trim

	EO	DT	NL	NL-OP
				
	Exit only no outside trim	**Dummy trim** pull when dogged	**Night latch** key retracts latchbolt	**Night latch** key retracts latchbolt optional pull required
Product description	3350AWDC-EO 3550AWDC-EO	33950AWDC-DT 3550AWDC-DT	3350AWDC-NL 3550AWDC-NL	3350AWDC-NL-OP 3550AWDC-NL-OP
Trim description	—	386DT	386NL	388
Base size	—	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 5/8" (190x41mm)	7 15/32" x 1 11/16" (190x43mm)
Grip size	—	8 1/2" x 4 5/16" (216x110mm)	8 1/2" x 4 5/16" (216x110mm)	—
Projection	—	2 7/16" (62mm)	2 7/16" (62mm)	1" (25mm)
ANSI function	01	02	03	03
Cylinder type	—	—	Rim	Rim
Handing	—	—	Handed	—
Optional trim	—	x 360L-DT x 550DT x IVES 8190	—	x 550DT x IVES 8190 10"

	L	L-BE	T	T-BE
				
	Lever key locks and unlocks	**Lever blank escutcheon** always operable (no cylinder)	**Thumbturn** key locks and unlocks (behind C/case)	**Thumbturn** always operable (no cylinder) (behind C/case)
Product description	3350AWDC-L 3550AWDC-L	3350AWDCA-L-BE 3550AWDC-L-BE	3350AWDC-T 3550AWDC-T	3350AWDC-T-BE 3550AWDC-T-BE
Trim description	360L	360L-BE	360T	360T-BE
Base size	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)	7 1/2" x 1 11/16" x 7/8" (190x43x22mm)
Grip size	—	—	—	—
Projection	3" (76mm)	3" (76mm)	1 13/16" (46mm)	1 13/16" (46mm)
ANSI function	08 or 09 field selectable	—	11 or 12 field selectable	—
Cylinder type	1 1/4" Mortise	—	1 1/4" Mortise	—
Handing	Handed/Reversible	Handed/Reversible	—	—
Optional trim	—	E360L-BE	—	E360T-BE

Standard door opening height
Feet (Inches)
6'8" - 7' (72" - 84")
7'1" - 8' (85" - 96")
8'1" - 9' (97" - 108")
9'1" - 10' (109" - 120")



Door Opening Height is measured from finished floor to frame rabbet on door side.

See table on left for standard offering.

Note: Non-standard sizes available with extended lead time. Consult Customer Care for more information 1-877-671-7011.

33A/35A Optional trim

	 **Lever** Pull when dogged	 **Night latch** key retracts latchbolt	 **Night Latch** key retracts latchbolt	 **Thumbturn** key locks & unlocks	 **Thumbturn** key locks & unlocks
Trim description	360L-DT	388 x 550DT	388 x IVES 8190 10"	360T x 550DT	360T x IVES 8190 10"
Base size	7 1/2 x 1 11/16" x 7/8" (190x43mmx22mm)	7 1/2 x 1 11/16" (190x43mm)	7 1/2 x 1 11/16" (190x43mm)	7 1/2 x 1 11/16" x 7/8" (190x43mmx22mm)	7 1/2 x 1 11/16" x 7/8" (190x43mmx22mm)
Grip size	—	10" center to center	10" center to center	10" center to center	10" center to center
Projection	3" (76mm)	1" (25mm)	1" (25mm)	1 13/16" (46mm)	1 13/16" (46mm)
ANSI function	02	03	03	11/12 Field selectable	11/12 Field selectable
Cylinder type	—	Rim	Rim	1 1/4" Mortise	1 1/4" Mortise
Handing	Handed / Reversible	—	—	—	—

ALLEGION™

VON DUPRIN®

AX exit devices

Featuring the 98/99, 94/95, 33/35A and 22 Series devices



The exit device that requires only 5 lbs. of force to operate

The AX was born out of a need to provide the market with a solution that meets the 2010 ADA Standards for Accessible Design (Chapters 404.2.7 and 309.4) that state the force required to activate operable parts shall be 5 lbs. maximum. The 2013 California Building Code (Chapter 11B-309.4) adopted virtually identical requirements that went into effect January 1st, 2013.

Since pioneering the first exit device in 1908, Von Duprin life safety products have provided unparalleled quality, performance and flexibility for schools, hospitals, stadiums and public buildings. These products come with the support and customer care only offered by Von Duprin. Providing the confidence and peace of mind at critical moments of life safety.

AX device specification requirements

Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, [OPTION for specific compliant products/applications: UL certified to meet maximum 5 pound requirements according to the 2010 ADA Standards for Accessible Design (Chapters 404.2.7 and 309.4) and California Building Code (Chapter 11B-309.4)] and UL listed for Panic Exit or Fire Exit Hardware.

How to identify the Von Duprin AX device

1. Look for the "AX" Prefix in the door schedule and/or specification.
2. In the field, look for the Compliance note on the UL Label and the AX Device Label. Both labels can be found on the center case cover of the exit device as shown below.



Contact Allegion today at 888.925.4359 or ax.allegion.com to learn how the AX device can help you provide accessibility without compromise.

AX98/99 Series Specifications

Device types	AX98/99 - Rim AXXP98/99 - Rim AX98/9927 - LBR AX98/9950 WDC - LBL AX98/9949 - LBL & LBL-AFL - Concealed Vertical Cable Less Bottom Latch
Device functions	EO, DT, NL, NLOP, L, LBE, LDT, LNL
Device lengths	3' / 4'
Rating	Panic and Fire
Electric options	**EL** - Electric latch retraction **LX** - Latchbolt monitor switch **LXLC** - Latchbolt monitor switch low current **LXRX** - Latchbolt pushpad monitor **LXRXLC** - Latchbolt pushpad monitor low current **RX** - Pushpad monitor switch **RXLC** - Pushpad monitor switch low current **RX2** - Double pushpad monitor switch **ALK** - Alarm kit **SS** - Signal switch
Mechanical options	**GBK** - Glass bead kit **-2** - Double cylinder **SNB** - Sex bolts **SEC** - Security screws **WP** - Weep holes
Dogging options (Panic only)	**Hex key dogging** = Standard **CD** - Cylinder dogging **DI** - Dogging indicator **LD** - Less dogging **SD** - Special dogging

AX94/95 Series Specifications

Device types	AX94/9547
Device functions	EO, DT, L, LDT, LBE, LNL
Device lengths	3' / 4'
Rating	Panic and Fire
Electric options	**LX** - Latchbolt monitor switch

AX33/35A Series Specifications

Device types	AX33/35A - Rim AX33/3549 - LBL & LBL-AFL - Concealed Vertical Cable Less Bottom Latch
Device functions	EO, DT, NL, NLOP, L, LBE, LDT
Device lengths	3' / 4'
Rating	Panic and Fire (3349 LBL/AFL only)
Electric options	**EL** - Electric latch retraction **LX** - Latchbolt monitor switch **LXLC** - Latchbolt monitor switch low current **LXRX** - Latchbolt pushpad monitor **LXRXLC** - Latchbolt pushpad monitor low current **RX** - Pushpad monitor switch **RXLC** - Pushpad monitor switch low current **RX2** - Double pushpad monitor switch **ALK** - Alarm kit **SS** - Signal switch
Mechanical options	**GBK** - Glass bead kit **SEC** - Security screws **WP** - Weep holes
Dogging options (Panic only)	**Hex key dogging** = Standard **CD** - Cylinder dogging **LD** - Less dogging

AX22 Series Specifications

Device types	AX22 - Rim AX2227 - LBR
Device functions	EO, DT, NL, NLOP, L, LBE
Device lengths	3' / 4'
Rating	Panic and Fire
Electric options	**LX** - Latchbolt monitor switch **RX** - Pushpad monitor switch **RX2** - Double pushpad monitor switch **ALK** - Alarm kit
Mechanical options	**GBK** - Glass bead kit
Dogging options (Panic only)	**Hex key dogging** = Standard **LD** - Less dogging

Ordering information

AX - 98 - - L - F - -2 - US26D - 3' - RHR - 996L - 06 - SNB

1	2	3	4	5	6	7	8	9	10	11	12
Prefix	Series	Device type	Function	Rating	Suffix	Finish	Door Width	Handing	Trim	Lever Style	Accessories

Selections correspond with the numbers above. See price book for specific configuration options.

1 Prefix

AX*	Accessible Device
EL	Electric latch retraction
LX	Latchbolt Monitor Switch
LXLC	Latchbolt Monitor Switch Low Current
LXRX	Latchbolt Pushpad Monitor
LXRXLC	Latchbolt Pushpad Monitor Low Current
RX	Pushpad Monitor Switch
RXLC	Pushpad Monitor Switch Low Current
RX2	Double Pushpad Monitor Switch
SS	Signal Switch

*Must be specified; may select more than one prefix.

2 Series

98	Series 98 - smooth
99	Series 99 - grooved
94	Series 94 - smooth
95	Series 95 - grooved
33A	Series 33A - grooved
35A	Series 35A - smooth
22	Series 22

Contact Allegion today at 888.925.4359 or ax.allegion.com to learn how the AX device can help you provide accessibility without compromise.

3 Device Type

N/A	Rim
27	Surface Vertical Rod
47	Concealed Vertical Rod
49	Concealed Vertical Cable

4 Function

EO	Exit Only
DT	Dummy Trim
NL	Night Latch
NLOP	Night Latch - Optional Pull
L	Lever
LBE	Lever - Blank Escutcheon
LDT	Lever, Rigid - Dummy Trim
LNL	Lever, Rigid - Night Latch

5 Rating

N/A	Panic
F	Fire-rated

6 Suffix

-2	Double Cylinder
LBL/LBR	Less Bottom Latch / Less Bottom Rod
LBL-AFL	Less Bottom Latch with Fire Pin
WH	Weep Holes

7 Finish

See pricebook for finish offering

8 Door Width

3'	Standard Default
4'	

9 Handing

RHR	Right Hand Reverse
LHR	Left Hand Reverse

10 Trim

See pricebook for trim/control offering

11 Lever Style

See pricebook for lever style offering

12 Accessories

ALK	Alarm Kit
GBK	Glass Bead Kit
SNB	Sex Bolts

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VON DUPRIN®

The light touch for complete accessibility

The Von Duprin AX

The Von Duprin AX: The exit device which requires only 5 lbs. of force to operate

For decades, architects have turned to Von Duprin for innovative solutions with proven performance. We delivered that once again with the AX, our newest exit device offering. This option provides a complete accessibility solution—without compromising any of the other elements that have made Von Duprin the industry's most trusted exit device manufacturer.

New maximum force code

The AX was born out of a need to provide the market with a solution that meets the 2010 ADA Standards for Accessible Design (Chapters 404.2.7 and 309.4) that state the force reqiured to activate operable parts shall be 5 lbs. maximum. The 2013 California Building Code (Chapter 11B-309.4) adopted virtually identical requirements that went into effect January 1st, 2013.

What this means to you

- New construction projects in the United States require exits to meet 5 lb. maximum operating force.
- An ideal fit for openings that demand maximum accessibility.

UL certification on new California Building Code requirements

The AX is subject to Von Duprin's standard testing to ensure it meets our own rigorous standards for durability, use and functionality. We also received a new UL certification confirming for you—and building inspectors—that an independent third party has verified that the AX is compliant with the 5 lb. maximum operational force requirement. The AX is the first UL-certified exit device to meet the new requirements put in place by ADA Standards and the California Building Code for accessible openings.

What this means to you

You can be assured that you're specifying a product that's been thoroughly tested to meet the ADA Standard as well as California Building Code's new code requirements. This will help minimize the risk of project delays, liability and lost time and money in having to re-specify an opening.

Accessibility without compromise

On the surface, the AX looks and performs the same as our traditional exit devices. But, through smart engineering and redesign, we've enabled the AX to meet 5 lb. operational force requirements. The chassis now requires less push force to actuate the latch, allowing for accessibility without compromise...the Von Duprin promise.





Von Duprin AX offering

Series	Device Type	Functions
98/99 Fire & panic	AX98/99 AXXP98/99 AX98/9927 LBR AX98/9949 LBL AX98/9950WDC LBL	Exit only/Dummy trim Night latch/Lever Night latch-optional pull Lever-blank escutcheon Lever-rigid-dummy trim Lever-rigid-night latch
94/95 Fire & panic	AX94/9547	Exit only/Dummy trim Night latch/Lever Lever-blank escutcheon Lever-rigid-dummy trim Lever-rigid-night latch
33A/35A Fire & panic	AX33/35A AX33/3549A LBL	Exit only/Dummy trim Night latch/Lever Night latch-optional pull Lever-blank escutcheon Lever-rigid-dummy trim
22 Fire & panic	AX22 AX2227 LBR	Exit only/Dummy trim/Night latch Night latch-optional pull Lever/lever-blank escutcheon

About Allegion

Allegion (NYSE: ALLE) creates peace of mind by pioneering safety and security. As a $2 billion provider of security solutions for homes and businesses, Allegion employs more than 8,000 people and sells products in more than 120 countries across the world. Allegion comprises 27 global brands, including strategic brands CISA®, Interflex®, LCN®, Schlage® and Von Duprin®. For more, visit **www.allegion.com.**

ALLEGION™

aptiQ ■ LCN ■ SCHLAGE ■ STEELCRAFT ■ VON DUPRIN

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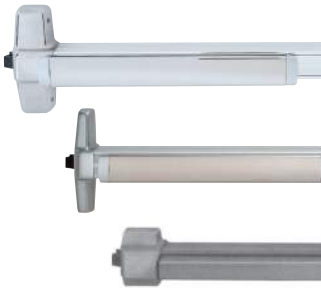
The first UL certified exit device to meet the new California Building Code Operating Force requirement

VON DUPRIN

AX exit devices

Featuring the 98/99, 33/35A and 22 Series devices



Changes to California Building Code effective January 1, 2014

There were many changes to the new California Building Code that took effect January 1st, 2014. One change impacting operable door hardware, including panic hardware, was the new requirement in chapter 11B for hardware to operate with a maximum of 5 pounds of force operation. "Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 pounds (22.2N) maximum"[1].

Von Duprin has the solution certified by UL to "Meet California Building Code (2013) Sec. 11B-309.4"

In order to ensure compliance, Von Duprin and UL tested the products both before and after cycling. **The testing was administered as follows:**

1. Unloaded operating forces must be below 5 lbs. before cycling.
2. Cycle device to 100,000 cycles.
3. Unloaded operating forces must be below 5 lbs. after cycling.
4. Loaded operating forces must be below 50 lbf. with a 250 lb. load on the door after cycle (Safety).

1 - 2013 California Building Code - Section 11B-309.4

Von Duprin AX offering

Series	Device Type	Functions
98/99 Fire & panic	AX98/99 AXXP98/99	Exit only / Dummy trim Night latch / Night latch - Optional Pull Lever / Lever-Blank Escutcheon Lever-Rigid-Dummy trim Lever-Rigid-Night latch
	AX98/9927 LBR AX98/9949 LBL AX98/9950WDC-LBL	
94/95 Fire & panic	94/9547	Exit only / Dummy trim Night latch / Lever / Lever-Blank Escutcheon / Lever-Rigid-Dummy trim Lever-Rigid-Night latch
33/35A Fire & panic	AX33/35A	Exit only / Dummy trim Night latch / Night latch - Optional Pull Lever / Lever-Blank Escutcheon Lever-Rigid-Dummy trim
	AX33/3549A LBL AX33/3349A-F LBL AX33/3549A-F LBL-AFL	
22 Fire & panic	AX22 AX2227-LBR	Exit only / Dummy trim Night latch / Night latch - Optional Pull Lever / Lever-Blank Escutcheon

How to identify the Von Duprin AX device

1. Look for the "AX" Prefix in the door schedule and/or specification.
2. In the field, look for the California Compliance note on the UL Label and the AX Device Label. Both labels can be found on the center case cover of the exit device as shown below.



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Learn more: ax.allegion.com

Electrical options

RX Request to exit

The RX (2xit) feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the pushpad.

The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

The RX switch option should not be used to control a load, but as a signalling switch (0.5 amps. resisitive maximum).

The RX switch is available in a low current (LC) switch. Most commonly used in computer operated monitoring systems.

To order, specify:

- Standard – use prefix RX, example RX99EO
- Low Current – use prefix RX-LC, example RX-LC98EO

RX2 Double request to exit

The RX2 feature uses two RX switches.

To order, specify:

- Standard – Use prefix RX2, example RX299EO

WP-RX Waterproof request to exit

LX Latchbolt monitoring



The LX feature is used to signal the use of an opening. This device is equipped with one internal SPDT switch which monitors the latch bolt.

The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

The LX switch option should not be used to control a load, but as a signalling switch (0.5 amps. resistive maximum).

The LX switch is available in a low current (LC) switch. Most commonly used in computer operated monitoring systems.

To order, specify:

- Standard – Use prefix LX, example LX99EO
- Low Current – Use prefix LX-LC, example LX-LC98EO

Electrical rating for all switches:

- Standard – 2 Amp maximum @ 24VDC
- Low Current (LC) - below 50 Milliamps @ 24VDC

Note: All switches can be either factory or field installed



SS Signal switch

Monitors pushpad and latch bolt

The SS feature is used to signal the unauthorized use of an opening. This device is equipped with two internal SPDT switches. One switch monitors both the pushpad and the latch bolt assembly, making the latch bolt tamper resistant, for positive security. An additional SPDT switch is connected to the 1 1/4" (32mm) mortise cylinder with straight cam for alarm "bypass." (Schlage cam reference L583-475). The device can be connected to a security console, or may be used as a single door alarm when used with a horn and power supply.

Pushpad reads: "Emergency Exit ONLY – Push To Open And Sound Alarm." Pushpad is only available in US32D finish with red silk-screened lettering.

The SS mortise lock device is furnished with both the signal switch device and the SS7500 mortise lock. The SS7500 mortise lock has the versatility and advantages of the 7500 lock with the addition of signalling functions to monitor latch bolt operation and the trim locking function. The SS7500 mortise lock is supplied standard with the SS mortise lock device.

To order, specify:

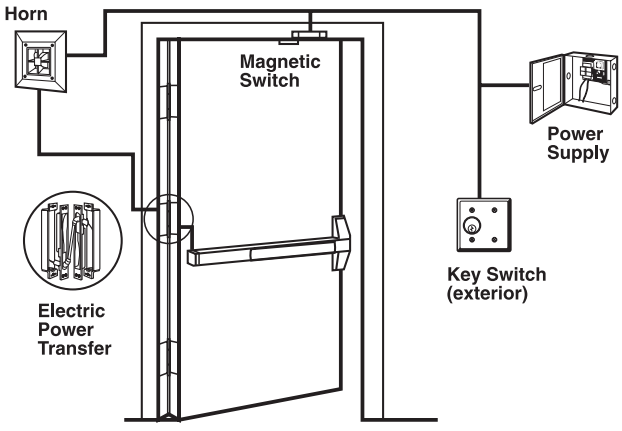
1. Prefix SS, example SS99L.
2. Handing required, LHR or RHR.

Electrical ratings:

Up to 2.0 AMPS @ 24VDC

Popular SS application

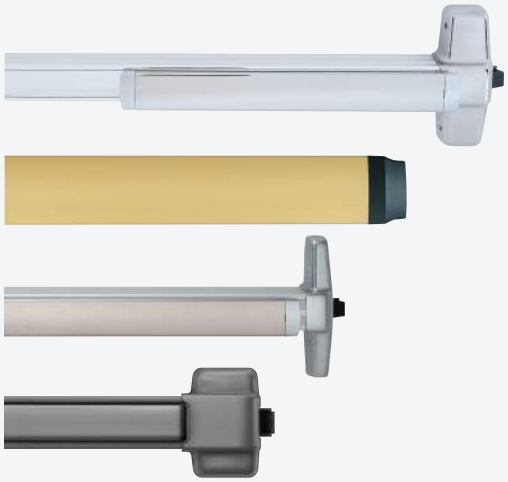
Unauthorized use of this opening will activate the local horn. The key switch permits inhibiting this system for authorized entry.



VON DUPRIN®

Quiet Electric Latch Retraction-QEL

Featuring 98/99, 94/95, 33A/35A & 22 Series Exit Devices



Overview

Quiet electric latch retraction (QEL) provides electronic control of an exit device for environments where limited operational noise is desired. The QEL option is Von Duprin's solution of choice for hospitals, libraries, museums and theaters where ambient noise can be disruptive. It is available on all Von Duprin 98/99, 94/95, 33A/35A, and 22 Series exit devices.

These devices always provide mechanical egress. The electrified latch retraction can also be activated by an access system or building automation system to unlatch the exit device momentarily. Often the QEL is used with a credential reader and access control system to unlock the door momentarily for authorized users.

The QEL can also be configured to electronically retract the latch for an extended period of time to allow free entry. This is a convenient alternative to mechanical dogging. If manual dogging is required, the hex dogging option is available, to order specify HD-QEL on non fire-rated devices. Special center case dogging is also available for 98/99 rim and vertical systems, specify SD-QEL.

The QEL option is available on panic devices and fire rated devices. Fire rated openings have several additional requirements. They must be self latching and self closing. To satisfy these requirements the QEL must be paired with an automatic operator and under the control of an automatic fire alarm system when used on fire rated openings.

Features & Benefits

- QEL option available on all 98/99, 94/95, 33A/35A, and 22 Series exit devices
- Energy efficient motorized latch retraction utilizes standard 2 amp power supply, enabling longer wire runs from power source
- Quiet operation in both mechanical and electronic states
- Modular design allows for a simplified installation
- On-board installation and troubleshooting diagnostics built into device
- Auto adjust latch retraction – automatically adjusts latch throw and pull
- Pushbar is pulled in electronically for quieter operation when dogged
- Vandal resistant – detects and responds to events of attack and tampering

Specifications Compliance

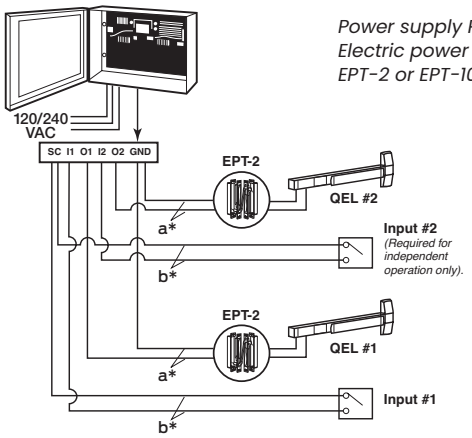
- Devices are BHMA Certified to ANSI/BHMA A156.3 (2001) Grade 1 for Exit Devices
- Devices are UL and cUL Listed as "Panic Hardware" (UL 305) and as "Fire Exit Hardware" (UL 10C)
- The QEL Conversion Kit is UL Classified under "Accessories for Single-Point Locks and Latches and Fire Exit Hardware" (UL 10C)

Electronic Specifications

QEL Electrical Load	
Voltage	24 VDC
Current	1.0 A Inrush (0.5 sec) 0.14 A Holding

QEL Wire Run Lengths	
Distance (one way)	Wire Gauge
Current	1.0 A Inrush (0.5 sec) 0.14 A Holding
200'	18 AWG
320"	16 AWG
500'	14 AWG
800'	12 AWG

QEL Wire Run Lengths



Power supply PS902-2RS
Electric power transfer
EPT-2 or EPT-10

Accessories

The QEL has a low in rush current = 1.0 amps, so it can be used with standard Schlage power supplies. When powering multiple components, verify that the amperage requirements of all components combined does not exceed the power supply output rating, see table below for output ratings.

Schlage PS902	Schlage PS904	Schlage PS906
Up to 2 amps	Up to 4 amps	Up to 6 amps

How to Order

- **Standard** – Use prefix QEL, example QEL99L
- **Special Center Case Dogging** – Use prefix SD-QEL, example SD-QEL99L*
- **Hex Dogging** – Use prefix HD-QEL, example HD-QEL99L

* SD QEL is available for the 98/99 Series only.

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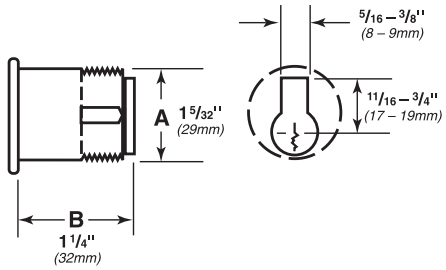
Cylinders

Cylinders

Cylinders are not furnished with device or trim and must be specified when ordering. Refer to exit device catalogs for cylinder requirements.

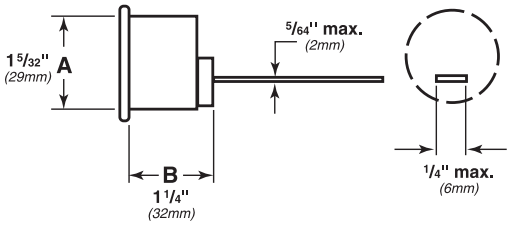


Mortise — 3215 (Schlage 20-001, B502-191 cam)





Rim — 3216 (Schlage 20-022 cam)



3218 Dummy



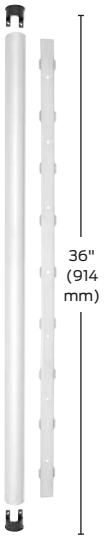
Glass bead kit – GBK

Glass bead conversion kits are used on doors with glass beads. Each kit consists of 1¼" (6mm) shim sets. GBK for Surface Vertical Rod ships with 1⅛" (3mm) shims for rod guides. Shims are not required for top and bottom latches

To order, specify:

1. Device Model. Example: 99GBK
2. Device type (rim, mortise, surface vertical rod, concealed vertical rod)
3. Wood door, when used with concealed vertical rod
4. Specify if using with 499F Strike
5. Finish

RG-27 Vertical rod and latch guard



Rod guard

RG-27 Series vertical rod and latch guards protect the bottom rods of exit devices from the damaging impacts of carts or gurneys passing through doors. (If bottom rods become damaged, the exit device will not function as intended and can jeopardize the ability to exit safely during an emergency.)

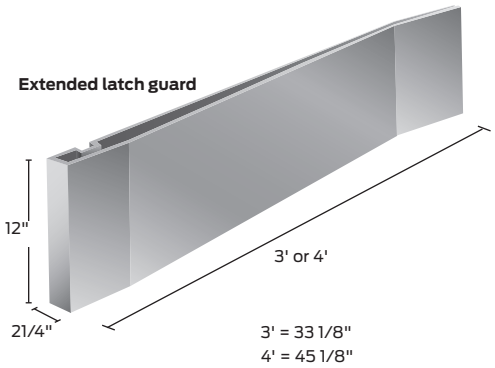
In addition to protecting the vertical rod, the guard provides a smooth, unobstructed surface so the door can be pushed open easily with the bumpers of a wheelchair. The latch guard portion is 10" high. The standard latch guard features a 45° ramp. The extended latch guard offers a continuous ramp in 3' or 4' widths.

All stainless steel construction in US32D finish. Latch guards can cover latches as large as 1¼"W x 10"H x 1⅞" projection.

Latch guard



Extended latch guard



Models

RGO	Rod guard only (Projection 1 3/16")
RG-27	Rod and latch guard
RG-27-3	3' (914 mm) Rod guard and extended latch guard
RG-27-4	4' (1219 mm) Rod guard and extended latch guard
LGO	Latch guard only
LGO-3	3' (914 mm) Extended latch guard only
LGO-4	4' (1219 mm) Extended latch guard only

Note: Not for use on wood fire doors, except with SLM (special laminate material) blocking.

To order, specify:

1. Model number.
2. Handing (except on RGO).
3. Door material if other than Hollow Metal.
4. Optional sex bolt mounting available.

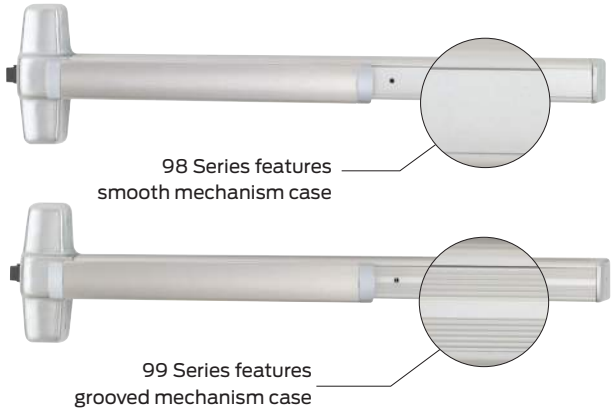
VON DUPRIN®

Exit device

98/99 Series

Overview

The 98/99 Series devices are heavy-duty push pads. The 98 Series has a smooth mechanism case, while the 99 Series has a grooved mechanism case. The 98/99 Series has been certified to the highest industry standards and are used in schools, hospitals and government buildings.



Device types



Rim device



75 Mortise lock device



27 Surface mounted vertical rod device [1]



47 Concealed vertical rod device, 5/16" throw [1]

48 Concealed vertical rod device, 5/8" top, 1 1/2" bottom throw



47WDC Concealed vertical rod wood door device [1]



49 Concealed vertical cable device [2]



50WDC Concealed vertical cable wood door device



57 Three-point latch device

[1] Also available less bottom rod (LBR)
[2] Also available less bottom latch (LBL)

ALLEGION™

VON DUPRIN®

Exit device
98/99 Series

Finishes



605
Bright Brass



606
Satin Brass



612
Satin Bronze



619
Satin Nickel



622
Matte Black

625
Bright Chrome



626
Satin Chrome



626AM
Satin Chrome, Antimicrobial



628
Aluminum, Clear Anodized



630
Satin Stainless



630AM
Satin Stainless, Antimicrobial



643e
Aged Bronze



693
Black



710
Dark Brown, Anodized

Due to the many variations in monitors and printers, color samples may appear different than the physical product. Contact your local sales representative for a physical color sample.

ALLEGION™

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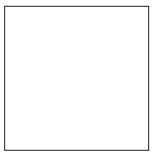
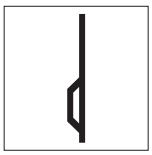
Exit device
98/99 Series

Trim functions



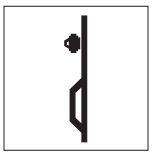
EO **No outside trim**

- Exit only



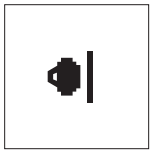
DT **Dummy trim**

- Pull when dogged (not recommended for fire device)



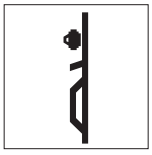
NL **Night latch**

- Key retracts latchbolt
- Rim and 1 ¼" mortise cylinder



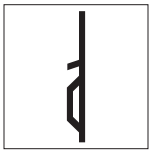
NLOP **Night latch**

- Key retracts latchbolt, pull required



TP **Thumbpiece**

- Key locks and unlocks
- Rim and 1 ¼" mortise cylinder



TPBE **Thumbpiece, blank escutcheon**

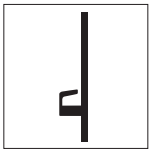
- Blank escutcheon always operable (no cylinder, use with DT trim)



L **Lever**

K **Knob**

- Key locks and unlocks
- Rim and 1 ¼" mortise cylinder
- Handed, reversible lever
- Electrified lever operation available



LDT **Lever, dummy trim**

KDT **Knob, dummy trim**

- Pull when dogged



LNL **Lever, night latch**

KNL **Knob, night latch**

- Key retracts latchbolt
- Rim and 1 ¼" mortise cylinder
- Handed, reversible lever



LBE[1] **Lever, blank escutcheon**

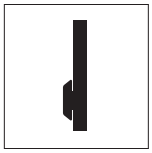
KBE **Knob, blank escutcheon**

- Always operable (no cylinder)



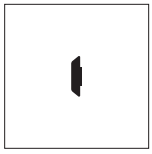
TL **Turn lever**

- Key locks and unlocks (use with DT trim)
- 1 ¼" mortise cylinder



TLBE **Turn lever, blank escutcheon**

- Blank escutcheon always operable (no cylinder, use with DT trim)



TLOP **Turn lever, optional pull**



HL **Hospital latch**

- Key locks and unlocks
- 1 ¼" mortise cylinder

ALLEGION™

VON DUPRIN®

Exit device
98/99 Series

Trim styles



990



996



696



697
3/4" (19mm) diameter pull



392-7



HL



374



VR910



VR914

Dimensions

Trim style	Width	Height	Thickness	Projection
990	3"	14 3/16"	3/32"	2"
996 Knob	2 3/4"	10 3/4"	27/32"	3 1/4"
996 Lever	2 3/4"	10 3/4"	27/32"	2 7/8"
696	1 5/8"	13 1/2"	3/16"	2 1/6"
697	1 5/8"	13 1/2"	3/16"	3"
392-7	3/4" inch round stainless steel with 7" center to center that matches the 98/99 center case. 3 1/2" offset with 1 1/2" clearance.			
HL	2 9/16"	7 7/8"	-	2 5/8"
374	2 3/4"	10 3/4"	27/32"	
VR910/914 with RIM/verticals	5 1/2"	11"	-	
VR910/914 with mortise	7 1/4"	11"	-	

ALLEGION™

Lever styles

Decorative levers



M51
- Knurling available



M52
- Knurling available



M53



M54



M55



M56



M57[1]



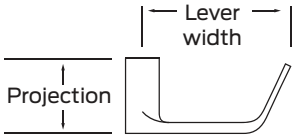
M61
- Handed



M62[1]
- Handed

Dimensions

Lever	Width	Projection
M51	4.5"	2.5"
M52	4.5"	2.4"
M53	4.4"	2.4"
M54	4.4"	2.3"
M55	4.4"	2.7"
M56	4.5"	2.3"
M57	4.5"	2.7"
M61	4.5"	2.7"
M62	4.6"	2.4"



[1] Available in stainless steel substrate only

Lever styles

Decorative levers



M63
- Handed



M81
- Knurling available



M82



M83



M84



M85
- Handed



ME1[1]
- Handed



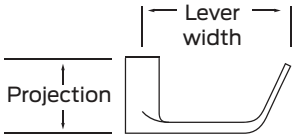
ME2[1]
- Handed



ME3[1]

Dimensions

Lever	Width	Projection
M63	4.6"	2.6"
M81	4.8"	2.5"
M82	4.9"	2.5"
M83	4.7"	2.25"
M84	5.1"	2.2"
M85	4.9"	2.7"
ME1	5.4"	2.6"
ME2	5.2"	2.4"
ME3	5"	2.8"



[1] Designed with Gensler as product design consultant

VON DUPRIN®

Exit device
98/99 Series

Lever styles

Standard levers



01



02
- Knurling available



03
- Knurling available



05



06
- Default lever
- Suites with Schlage Rhodes
- Knurling available



07
- Suites with Schlage Athens



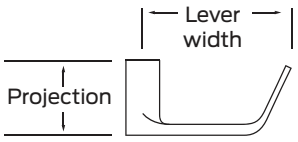
12
- Handed



16
- Suites with Schlage Omega

Dimensions

Lever	Width	Projection
01	4.0"	2.1"
02	4.75"	2.3"
03	4.75"	2.813"
05	3.75"	2.8"
06	4.7"	2.1"
07	4.6"	2.3"
12	4.3"	2.9"
16	5.05"	2.66"



ALLEGION™

Lever styles

Standard levers



17
- Suites with Schlage Sparta
- Knurling available



18



Accent (ACC)
- Handed



Asti (AST)
- Handed



Merano (MER)
- Handed



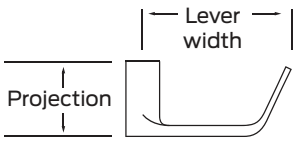
Latitude (LAT)



Longitude (LON)

Dimensions

Lever	Width	Projection
17	4.7"	2.3"
18	4.75"	2.4"
Accent (ACC)	4.4"	3.1"
Asti (AST)	4.2"	2.5"
Merano (MER)	4.1"	2.5"
Latitude (LAT)	4.6"	2.3"
Longitude (LON)	4.9"	2.3"



Electromechanical device options

Switches

LX — **Latchbolt monitoring**

LX-LC — **Latchbolt monitoring, low current**
- Signals use of an opening
- SPDT switch to monitor latch bolt
- 2 A maximum @ 24VDC; below 50 mA @ 24VDC for low current option

RX — **Request to exit**

RXLC — **Request to exit - low current**

RX2 — **Double request to exit - 2 RX switches**

WP-RX — **Waterproof request to exit**

RX-AUX — **RX to RX-2 conversion**
- Signals use of an opening
- SPDT switch to monitor pushpad
- 2 A maximum @ 24VDC; below 50 mA @ 24VDC for low current option

LX-RX — **Request to exit/latchbolt monitoring combination**

LX-RX-LC — **Request to exit/latchbolt monitoring combination, low current**
- 2 A maximum @ 24VDC; below 50 mA @ 24VDC for low current option

SS — **Signal switch**
- Monitors pushpad and latchbolt
- Signals unauthorized use of an opening
- Switch makes latch bolt tamper-resistant
- Up to 2.0 A @ 24VDC

Latch retraction

EL — **Electric latch retraction**

SD-EL — **Electric latch retraction with special center case dogging**
- Enables remote unlatching
- Alternative to manual dogging
- Voltage: 24VDC (continuous duty)
- Current: 16.0 A inrush / 0.3 A holding

QEL — **Quiet electric latch retraction**

HD-QEL — **Quiet electric latch retraction with hex dogging**

SD-QEL — **Quiet electric latch retraction with special center case dogging**
- Bolt retraction via switch
- Converts exit door to push-pull operation
- Voltage: 24VDC
- Current: 1.0 A inrush (0.5 sec.) / 0.14 A holding

Delayed egress

CX — **Chexit delayed exit**
- Meets NFPA 101 requirements
- Self-contained controls, locking, alarm
- Input voltage: 24VDC
- Input current inrush: 1.25 A
- Input current holding: 390 mA
- Alarm relay and secure relay contact ratings: 24 VDC, 1 A

CX-RCM — **Chexit remote module**
- Chexit for smaller doors that can not accommodate a standard Chexit device
- Size: 3.75” x 5.57” x 2.50”
- Input voltage: 24VDC
- Input current inrush: 1.25A
- Input current holding: 390mA
- Alarm relay and secure relay contact ratings: 24 VDC, 1 A

Miscellaneous

ALK — **Alarm exit kit**
- Unauthorized opening triggers 85-decibel horn
- Set in armed or disarmed mode by key
- Assembly includes both a 24VDC input and external inhibit

Electromechanical device options

CON — **Allegion Connect**

- Common connectors to connect various door hardware all the way to the power supply

E996 — **Electric locking and unlocking trim**

- Remains latched while unlocked
- Remote electrical control
- Voltage: 24VDC (Continuous Duty)
- Current: 0.22 amps

E7500 — **Electric mortise lock device**

- Voltage: 12 or 24VDC
- Current: 0.60 amps @ 12VDC, 0.30 amps @ 24VDC

Electromechanical device options

Matrix shows available options per device type but does not represent compatibly across multiple options.

	Switches									Latch retraction					Delayed egress		Misc			
	LX	LX-LC	RX	RXLC	RX2	WP-RX	LX-RX	LX-RX-LC	SS	EL	SD-EL	QEL	HD-QEL	SD-QEL	CX	CX-RCM	ALK	CON	E996	Mortise
98 99	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
98F 99F	■	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	
XP98 XP99		■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■	■	
XP98-F XP99-F		■	■	■	■	■	■	■		■		■			■	■	■	■	■	
9875 9975			■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■
9875-F 9975-F			■	■	■	■			■	■		■			■	■	■	■	■	■
9827 9927	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
9827-F 9927-F	■	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	
9857 9957	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
9857-F 9957-F	■	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	
9847 9947	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
9847-F 9947-F	■	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	
9848 9948	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
9848-F 9948-F	■	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	
9849 9949	■[1]	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
9849-F 9949-F	■[1]	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	
9847WDC 9947WDC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
9847WDC-F 9947WDC-F	■	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	
9850WDC 9950WDC	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
9850WDC-F 9950WDC-F	■	■	■	■	■	■	■	■	■	■		■			■	■	■	■	■	

[1] For 98/9949 devices, LX switch monitors trim input or electric dogging of EL/QEL devices. LX switch does not monitor latchbolt condition.

Mechanical device options

Dogging

CD — **Cylinder dogging, panic only**

CD-CX — **Center case cylinder dogging for Chexit devices**

CI — **Cylinder dogging indicator**
- Battery-operated dogging indicator in cylinder format with red light visible from over 75 feet away

DI — **Dogging indicator**
- Battery-operated dogging indicator in hex format with red light visible from over 75 feet away

LD — **Less dogging**

SD — **Special center case dogging**
- Center case cylinder dogging

Classroom security

-2 — **Double cylinder**
- Inside key cylinder locks/unlocks outside trim

-2SI — **Double cylinder with security indicator**
- Inside key cylinder locks/unlocks outside trim with visible indicators that provide status of door

CDSI — **Cylinder dogging with indicator**
- Provides visible lock/unlock indicators showing whether device is dogged or undogged

HDSI — **Hex dogging with indicator**
- Provides visible lock/unlock indicators showing whether device is dogged or undogged

Environmental

PN — **Pneumatic latch retraction**
- For areas where electrical devices banned
- Special linkage for mechanical or pneumatic dogging

QM — **Quiet mechanical option**
- Provides damper-controlled relatching of device

INS — **Insulclad kits**
- Kits with longer fasteners or parts for Insulclad doors

AM — **Anti-microbial finish**

Weatherized

WH — **Weep holes**
- Drainage (weep) holes in mechanism case

WS — **Windstorm**
- Severe weather certified/tested
- FEMA and ICC compliant
- Tornado and hurricane tested

California code

AX — **Accessible device**
- UL certified to meet new 5 lb. maximum operating force requirement
- Exceeds ANSI/BHMA requirements

Latches

PL — **Pullman latch**
- Latches are always extended
- Most commonly used in conjunction with electric strikes and LBR-less bottom rod application

Mechanical device options

Touch bar trim

RSS — **Red silk screen**
- Red silk-screened lettered touchbar trim

PUSH — **PUSH**
- Touchbar trim embossed PUSH

SG — **Safety glow**
- Self-illuminating touchpad
- Glows brightly during low or no light conditions

KN — **Knurled touchbar**
- Tactile warning applied to device

BRAILLE — **Braille**
- Vision impaired touchpad
- Raised letter and Braille

Mechanical device options

Matrix shows available options per device type but does not represent compatibly across multiple options.

	Dogging						Classroom security				Environmental				Weatherized		CA code
	CD	CD-CX	CI	DI	LD	SD	-2	-2SI	CDSI	HDSI	PN	QM	INS	AM	WH	WS	AX
98 99	■	■	■	■	■	■	■	■	■	■	■	■		■	■		■
98F 99F							■	■			■	■		■	■		■
XP98 XP99	■	■	■	■	■	■	■	■	■	■				■	■		■
XP98-F XP99-F							■	■						■	■		■
9875 9975	■	■	■	■	■	■	■		■	■	■			■	■		
9875-F 9975-F							■				■			■	■		
9827 9927	■	■	■	■	■	■			■	■	■	■		■	■	■	■ LBR
9827-F 9927-F											■	■		■	■	■	■ LBR
9857 9957	■	■	■	■	■	■			■	■	■			■	■	■	
9857-F 9957-F											■			■	■	■	
9847 9947	■	■	■	■	■	■			■	■	■		■	■	■		■ LBR
9847-F 9947-F											■			■	■		■ LBR
9848 9948	■	■	■	■	■	■			■	■	■			■	■		
9848-F 9948-F											■			■	■		
9849 9949	■	■	■	■	■	■			■	■	■		■	■	■		■ LBL
9849-F 9949-F											■			■	■		■ LBL
9847WDC 9947WDC	■	■	■	■	■	■			■	■	■			■	■		
9847WDC-F 9947WDC-F											■			■	■		
9850WDC 9950WDC	■	■	■	■	■	■			■	■	■			■	■		■ LBL
9850WDC-F 9950WDC-F											■			■	■		■ LBL

Mechanical device options

Matrix shows available options per device type but does not represent compatibly across multiple options.

	Latches	Touch bar trim				
	PL	RSS	PUSH	SG	KN	BRAILLE
98 99		■	■	■	■	■
98F 99F		■	■	■	■	■
XP98 XP99		■	■	■	■	■
XP98-F XP99-F		■	■	■	■	■
9875 9975		■	■	■	■	■
9875-F 9975-F		■	■	■	■	■
9827 9927	■	■	■	■	■	■
9827-F 9927-F		■	■	■	■	■
9857 9957		■	■	■	■	■
9857-F 9957-F		■	■	■	■	■
9847 9947	■	■	■	■	■	■
9847-F 9947-F		■	■	■	■	■
9848 9948		■	■	■	■	■
9848-F 9948-F		■	■	■	■	■
9849 9949		■	■	■	■	■
9849-F 9949-F		■	■	■	■	■
9847WDC 9947WDC		■	■	■	■	■
9847WDC-F 9947WDC-F		■	■	■	■	■
9850WDC 9950WDC		■	■	■	■	■
9850WDC-F 9950WDC-F		■	■	■	■	■

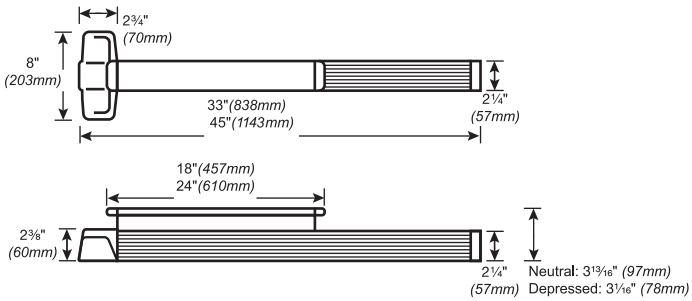
VON DUPRIN®

Exit device
98/99 Series

Specifications

Accessibility	▪ Force to depress push pad – AX device: 5 lbs – Standard device: 15 lbs ▪ Push pad projection – Neutral: 3 13/16" (97 mm) – Depressed: 3 1/16" (78 mm)
Certifications/ approvals	All Von Duprin 98/99 exit devices are ANSI/BHMA Certified. Please refer to the BHMA Certified Products Directory for specific listings.
Mounting height	39 13/16" (1011 mm) 39 11/16" (1008 mm) with mullion
Warranty	36 months from the date of placing the product in operation

Dimensions



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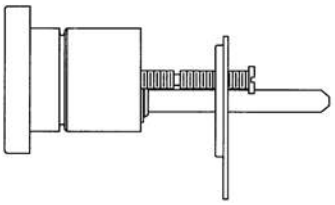
ALLEGION™

Full size interchangeable core cylinders for exit devices, aluminum door, etc.





Interchangeable core rim cylinders for exit devices	
Number	**Core mechanism**
20-057	Conventional core
20-757	Primus core
20-757-XP	Primus XP core
20-079	Housing only, less core

Available in 605, 606, 609, 612, 613, 619, 625, 626, and 643e finish.



Cylinders for Adams Rite MS and 4700 Series Lori 4500 Series and Corbin Russwin DL3000 Series		
Number	**Core mechanism**	**Collar**
26-098	Conventional core	Compression ring & spring
20-062	Conventional core	3/16" + 3/8" blocking rings
20-766	Primus core	3/16" + 3/8" blocking rings
20-766-XP	Primus XP core	3/16" + 3/8" blocking rings
20-060	Housing less core	None

These cylinders include set screw pack B220-050 for Adams Rite locks.



K510-711
Adams Rite
MS cam

Cylinders for Adams Rite 4070 Series deadlocks		
Number	**Core mechanism**	**Collar**
20-091	Conventional core	3/16" + 3/8" blocking rings
20-722	Primus core	3/16" + 3/8" blocking rings
20-722-XP	Primus XP core	3/16" + 3/8" blocking rings
20-090	Housing less core	None



B520-378
Adams Rite
4070 cam

Notes
1. Mortise cylinders available 605, 606, 609, 612, 613, 619, 625, 626, and 643e finish. Cores furnished 606 and 626 only.
2. To differentiate between Classic and Everest 29, specify keyway. Example: C or CP (Classic), S123 (Everest 29).
3. All cylinders are 1 1/2" long.
4. Specify LKB if 0-bitted Primus XP cylinders are required less key blanks.

Full Size Interchangeable Core Availability



A-Series
Orbit design



ND-Series lever
all designs

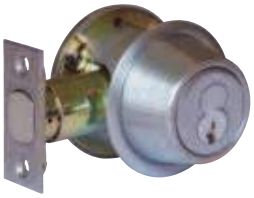


AL-Series
Saturn design



H-Series knob
Orbit design





B500-Series



L-Series
all designs
except concealed



B600 / 700-Series



S-Series
all designs
except Flair



D-Series knob
Orbit design

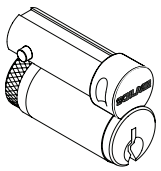


S200-Series
all designs for S210

All except Flair for other functions



Full Size Interchangeable Core Cylinders for Schlage Locksets



Full Size Core Only

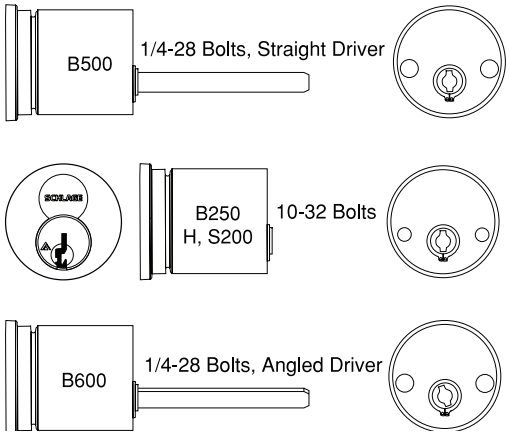
Number	Mechanism
23-030	Conventional core
30-120	Conventional core for hotel function (specify hand)
20-740-XP	Primus XP core (not available in hotel function)

Available 606 and 626 finish only. Order control keys separately.

Full Size IC Housings for Bored Deadlocks, Less Core

Lockset Series	Description	Number	Specify Finish
B500-Series	Outside	B610-203, B610-205	605, 609, 612, 613, 619, 625, 626, and 716
	Inside	B610-028**	605, 609, 612, 613, 619, 625, 626, and 716
B250, H, S200-Series	Outside	22-061	605, 606, 609, 610, 611, 612, 613, 616, 625, 626
	Inside of B252	22-062	
B600 / 700-Series	Outside	B610-027	605, 606, 609, 612, 613, 625, 626
	Inside	B610-028	See Note Below

Specify finish of B610-031 inside snap-on faceplate ordered separately for BC162 and B662/762.
**Inside housing does not include snap-on faceplate

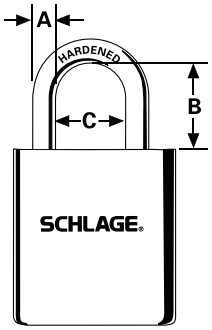




KS43F KS72F KS92M

Full Size Interchangeable Core Padlocks

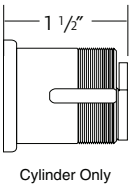
Part #	Shackle Dimensions		
	A	B	C
LESS CYLINDER - FULL SIZE INTERCHANGEABLE CORE			
BRASS BODY			
KS43A3200	3/8″	3/4″	3/4″
KS43D3200	3/8″	1 1/2″	3/4″
KS43F3200	3/8″	2″	3/4″
KS43G3200	3/8″	4″	3/4″
STEEL BODY			
KS72M3200	7/16″	1″	7/8″
KS72F3200	7/16″	2″	7/8″
KS92M3200	3/8″	1″	3/4″



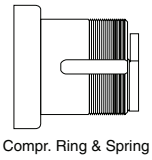
Note: To order Primus XP add the suffix - XP to the Primus part number. (Example: 12-345-XP)

Full Size Interchangeable Core Mortise Cylinders

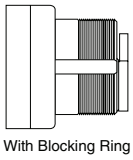




Cylinder Only



Compr. Ring & Spring



With Blocking Ring



Cylinders for Schlage L-Series Mortise Locks

	Design	Function	Core Mechanism		
			Conventional	Primus, Primus XP	Housing Less Core
	**L & N Escutcheons** (cylinders with compression ring)	All Except Below	30-008	20-798, 20-798-XP	30-007
		L9060P Outside	30-030	20-782, 20-782-XP	30-032 + 36-083
		L9485P, L9486P Hotel Funtions	30-010*	N/A	30-007
	**Sectional Trim** (cylinder with compression ring, spring and 3/8" blocking ring). 9060 requires 1/2" blocking ring.	All Except Below	30-138	20-776, 20-776-XP	30-137
		L9060P Outside	30-030 + 36-083 + 35-082-030	20-783, 20-783-XP	30-032 + 36-083 + 36-082-050
		L9485P, L9486P Hotel Funtions	30-040*	N/A	30-137

* Hotel function cores are handed. Specify hand of door.



L583-489
Cam for All Functions Except L9060 Outside



K510-680
Cam for L9060 Outside

Mortise Cylinders with Straight Cam for Exit Devices

Number	Core Mechanism	Collar
26-091	Conventional core	Compression ring & spring
20-061		3/8" blocking rings + compression ring & spring
20-763, 20-763-XP	Primus/Primus XP core	Compression ring & spring
20-771, 20-771-XP		3/8" blocking rings + compression ring & spring
20-059	Housing less core	None
26-064		Compression ring & spring

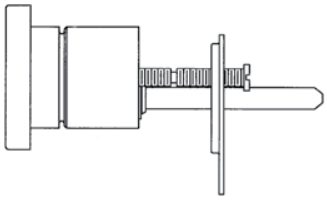


K510-730
Straight Cam, Other Applications

Notes 1. Available 605, 606, 609, 610, 612, 613, 625, and 626 finish. Cores furnished 606 and 626 only.
2. To differentiate between Classic and Everest, specify keyway. Example: C or CP (Classic), C123 (Everest). Everest C123 keyway standard.
3. All cylinders are 1 1/2" long.
4. Specify LKB if 0-bitted Primus XP cylinders are required less key blanks.

Full Size Interchangeable Core Cylinders for Exit Devices, Aluminum Doors, etc.





Interchangeable Core Rim Cylinders for Exit Devices

Number	Core Mechanism
20-057	Conventional core
20-757	Primus core
20-757-XP	Primus XP core
20-079	Housing only, less core

Available 605, 606, 609, 610, 612, 613, 625 and 626 finish.



Cylinders for Adams Rite MS and 4700 Series Lori 4500 Series and Corbin Russwin DL3000 Series

Number	Core Mechanism	Collar
26-098	Conventional core	Compression ring & spring
20-062	Conventional core	3/16″ + 3/8″ blocking rings
20-766	Primus core	3/16″ + 3/8″ blocking rings
20-766-XP	Primus XP core	3/16″ + 3/8″ blocking rings
20-060	Housing less core	None

These cylinders include set screw pack B220-050 for Adams Rite locks.



K510-711
Adams Rite
MS Cam

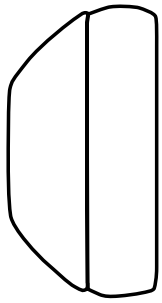
Cylinders for Adams Rite 4070 Series Deadlocks

Number	Core Mechanism	Collar
20-091	Conventional core	3/16″ + 3/8″ blocking rings
20-722	Primus core	3/16″ + 3/8″ blocking rings
20-722-XP	Primus XP core	3/16″ + 3/8″ blocking rings
20-090	Housing less core	None



B520-378
Adams Rite
4070 Cam

Notes
1. Mortise cylinders available 605, 606, 609, 610, 612, 613, 625, and 626 finish. Cores furnished 606 and 626 only.
2. To differentiate between Classic and Everest, specify keyway. Example: C or CP (Classic), C123 (Everest).
3. All cylinders are 1 1/2″ long.
4. Specify LKB if 0-bitted Primus XP cylinders are required less key blanks.

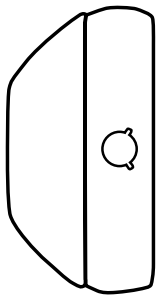


VR910-DT With black grip
VR914-DT Without black grip

- For use with Von Duprin 98/99 Series rim and vertical rod exit device
- Non-handed
- Thru-bolts direct to the exit device
- Pull operation only.

Width	Height	Thru-Bolt Pattern	Clearance Grip to Door	Projection
5-1/4"	11"	1-3/8" wide x 7" high	1-1/2"	1-7/8"

Finishes	
US Finish	US32D
BHMA	630

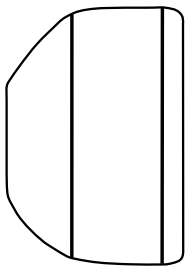


VR910-NL With black grip
VR914-NL Without black grip

- For use with Von Duprin 98/99 rim and vertical rod exit device
- Non-handed
- Thru-bolts direct to the exit device

Width	Height	Thru-Bolt Pattern	Clearance Grip to Door	Projection
5-1/4"	11"	1-3/8" wide x 7" high	1-1/2"	1-7/8"

Finishes	
US Finish	US32D
BHMA	630

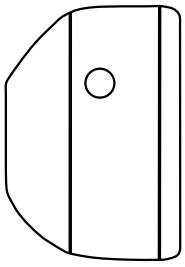


VR910M-DT With black grip
VR914M-DT Without black grip

- For use with Von Duprin 9875/9975 mortise lock exit device
- Non-handed
- Thru-bolts direct to the exit device

Width	Height	Thru-Bolt Pattern	Clearance Grip to Door	Projection
7-1/4"	11"	1-3/8" wide x 7" high	1-1/2"	1-7/8"

Finishes	
US Finish	US32D
BHMA	630



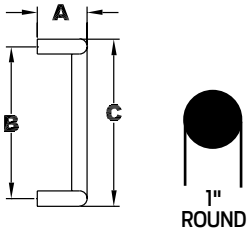
VR910M-NL RHR With black grip
VR910M-NL LHR With black grip
VR914M-NL RHR Without black grip
VR914M-NL LHR Without black grip

- For use with Von Duprin 9875/9975 Series mortise lock exit device
- Thru-bolts direct to the exit device
- Night latch operation (cylinder not furnished)

Width	Height	Thru-Bolt Pattern	Clearance Grip to Door	Projection
7-1/4"	11"	1-3/8" wide x 7" high	1-1/2"	1-7/8"

Finishes	
US Finish	US32D
BHMA	630





8190EZHD 90º Offset Solid Door Pull

Available Sizes: 8", 10", 12", 18"

Certifications

Meets ANSI A156.06
Complies with ADA and Barrier Free Applications

Mounting

- Heavy Duty mounting hardware exceeds industry standards
- 3/8-16 mounting hardware
- Specify door thickness. Standard mounting hardware for door thickness of 1-1/2" to 1-3/4" unless otherwise specified. Optional package available for 2" and 2-1/4" thick doors.
- Comes Standard with thru-bolt screws and decorative washers.
- Optional Mounting Hardware available (see General information section for details) A, F, I, L, N, O, P, Q, X
- *Mounting hardware for other door thicknesses are available as engineering special, consult customer service.*

Product number	Projection "A"	Clearance	Center to center "B"	Overall length "C"	Offset "D"
8190EZHD-8	3-1/2"	2-1/2"	8"	9"	3-1/4"
8190EZHD-0	3-1/2"	2-1/2"	10"	11"	3-1/4"
8190EZHD-2	3-1/2"	2-1/2"	12"	13"	3-1/4"
8190EZHD-18	3-1/2"	2-1/2"	18"	19"	3-1/4"

Finishes

- Available in Aluminum, Brass, and Stainless Steel substrates. See General information section for specific BHMA finish code, finish description, US finish code, and substrate information.
- 316 Series Stainless Steel standard, exceeding industry standards for corrosion resistance. Recommended for external applications
- Standard finishes available;
  605, 606, 612, 613, 619, 625, 626, 626-AM, 628, 629-316, 630-316, 630-AM
- *Custom finishes are available as engineering special, consult customer service.*

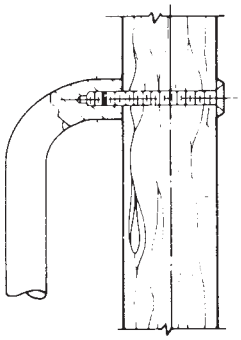
Additional Information

- Specify PR when ordering a set of pulls for back to back mounting
- For one back to back machined pull, specify Nsgl or Psgl (glass doors)
- Custom lengths are available as engineering special, consult customer service.

Mounting

- All mounting hardware is for standard 1-3/4" door.
- Consult Customer Service if other than standard.

Type Standard Mount

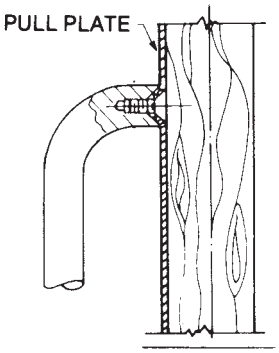


Standard Mounting

- (2) 3/8-16 x 2-1/4" brass, flat head machine screws; plate to match.
- (2) 3/8-16 countersunk washers; plated to match

Note: 8102HD and 8105 have (2) 5/16-18 x 2-1/2" machine screws
-Options: (2) 5/16 countersunk washers

Type G Mount



Concealed Pull Plate Mounting

Available only for 8302, 8303, 8311 Pull Plates.

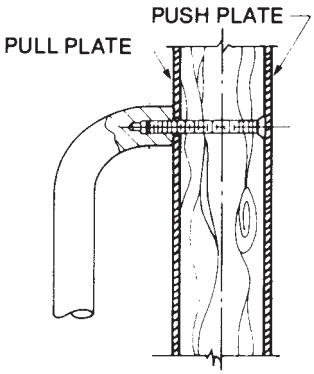
- (2) 3/8-16 x 5/8" steel flat head machine screws; zinc plated.

Pull mounts directly onto plate.

Plate is attached to door by 6 screws.

Note: 8302 has (2) 5/16-19 x 5/8" steel flathead zinc plated screws

Type F Mount



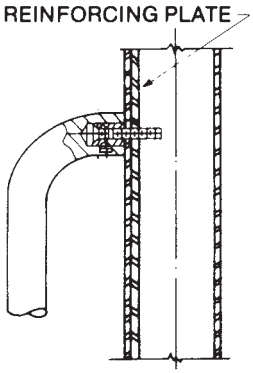
Wood Doors
Concealed Pull Mounting With Push Plate

- (2) 2-1/4" steel flat head machine screws; zinc plated.

Available only for 8102HD, 8103HD, 8105, 8111, 8302, 8303, 8305 and 8311. Plate on opposite side of door must be ordered separately.

Note: 8102HD, 8302 will have 5/16-18
8105, 8111, 8305, 8311 will have 1/4-20
8103HD, 8303 will have 3/8-16"

Type H-I-L Mount



Reinforced Hollow Metal Door
Concealed Pull Mounting

Available only for 8102, 8103, 810EZ or wood door pulls, 8302, 8303 pull plates and 9264, 9265, 9266 and 9267 long door pulls.

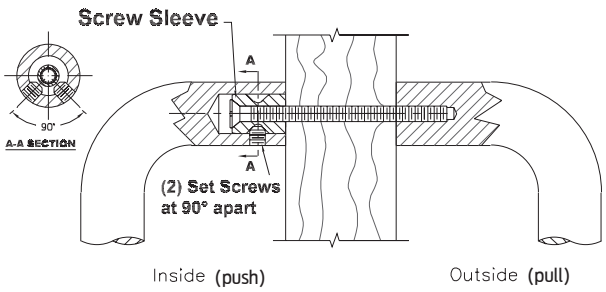
- (2) Steel screw sleeves; zinc plated.
- (2) Steel countersunk trim head machine screw; zinc plated for reinforced metal door.
- (2) Steel countersunk trim head steel metal screw; zinc plated for wood doors.

Note: 8102HD and 8302 will have 5/16-18"
8103HD, 8103EZHD, 8303 will have 3/8-16

Mounting for 8103EZ, 8190, 9100, 9103EZ, 9190 and 9264, 9265, 9266 and 9267 long door pulls.

- All mounting hardware is for standard 1-3/4" door.
- Consult Customer Service if other than standard.

Type J/N Mount



Back to Back "Two-Anchor"

Wood or Metal Door

Available only for 8103EZHD, 8190HD, 9100HD push/pull combinations and 9264, 9265, 9266 and 9267 long door pulls.

- (2) 3/8-16 x 2-3/4" steel countersunk trim head machine screws with (4) set screws for maximum anchoring force.
- (2) Steel screw sleeves; zinc plated.

Type NS-Standard Push/Pull Mounting

Type N & Standard

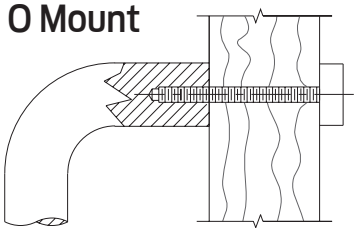
Pushbar to Pull

- (1) 3/8 - 16 X 3"steel countersunk trim head machine screws with (2) set screws.
- (1) steel screw sleeve, zinc plated.

Free End Pushbar & Pull

- (2) 3/8 - 16 X 2-1/4" brass, oval head mach screws; plated to match.
- (2) No. 14 countersunk washers; plated to match.

Type O Mount



Decorative Blind Thru - Bolt

Wood or Metal Door

Available only for 8103EZHD, 8190HD and 9100HD Series Push/Pull Combinations.

- (2) 3/8-16 x 2-1/4" blind thru - bolts; plated to match.

Type NO Push/Pull Mounting

Type N & Type O

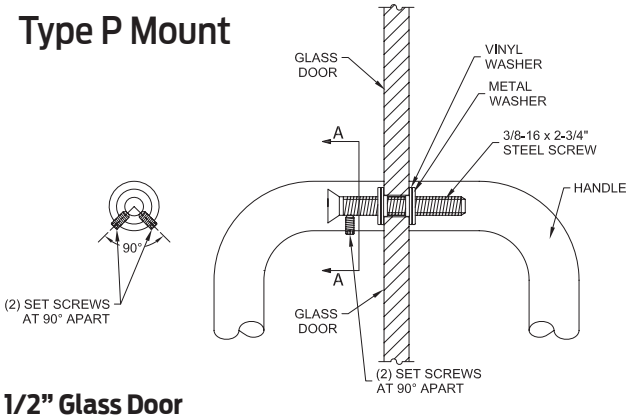
Pushbar to Pull

- (1) 3/8 -16 X 3"steel countersunk trim head machine screws with (2) set screws.
- (1) steel screw sleeve, zinc plated.

Free End Pushbar & Pull

- (2) 3/8 - 16 X 2-1/4" blind thru-bolts; plated to match.

Type P Mount



1/2" Glass Door

Available only for 8103EZHD, 8190HD, 9100HD, 9265 and 9266 long door pulls.

- (2) 3/8-16 x 2-1/4" steel countersunk trim head machine screws with (4) set screws for maximum anchoring force.
- (2) Steel screw sleeves; zinc plated
- (2) Metal and Vinyl washers



COR

Series Bar Coodinators

- The COR Series Coordinators are designed for use on pairs of doors when one door needs to close before the other.
- All COR units function easily. The active door lever, located nearest to the active stop, holds the active door open until the trigger mechanism is released by the closing of the inactive leaf.
- All COR units may not function correctly with swingclear hinges.
- All COR units are equipped with an adjustable override feature which allows the active door to close under extreme pressure.
- All COR units are compatible with Flush Bolts.
- The COR Series is available in five sizes for variable door opening widths.
- The COR Series does not cover the entire length of the stop, so a FL filler bar can be provided to maintain architecturally clean lines.
- COR Series Coordinator Channels and FL fillers are made of aluminum.
- Optional Filler Bars: FL20 - 20", FL32 - 32" and FL44 - 44", available to maintain clean line.
- Optional Mounting Brackets available: MB1, MB2, MB1F, MB2F, MB3F, MB1V, MB2V, and MB3V for other stop applied hardware.

Meets ANSI/BHMA A156.3, Type 21A.
UL Listed for installation on labeled frame.

For Openings Where Doors Are Same Size

Coordinator Number	Length of Channel	For Opening Widths	Common Applications
COR32	32"	34" - 52"	Pair of 2'0" Doors
COR42	42"	52" - 72"	Pair of 2'6" Doors
COR52	52"	62" - 92"	Pair of 3'0" Doors
COR60	60"	70" - 108"	Pair of 3'6" Doors
COR72	72"	84" - 132"	Pair of 4'0" Doors

For Openings Where Doors Are Unequal Size

The coordinator length should equal the active door width plus approximately 1/2 the inactive door width. The coordinator must be 6" longer than the active door width and shorter than the overall frame opening between stops.

Finishes

Ives Finish	US28	US26D	315AN
BHMA	628	713	711



FL

Series Filler Bars

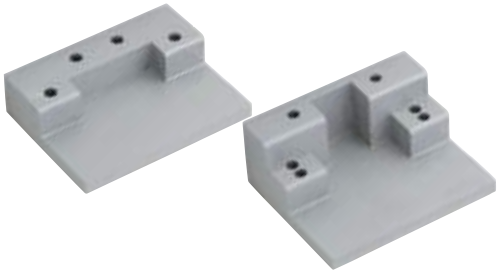
- The FL Filler Bars are available in three sizes for variable frame openings.
- FL Filler Bars are made of aluminum
- FL Filler Bars are field sized to frame opening.

Filler Bar Number	Length	Dimensions
FL20	20"	1-5/8" W x 5/8" D x 20" L
FL32	32"	1-5/8" W x 5/8" D x 32" L
FL44	44"	1-5/8" W x 5/8" D x 44" L

Finishes

Ives Finish	US28	US26D	315AN
BHMA	628	713	711

MB1and MB2



Mounting Brackets

- Allows stop mounted hardware to be properly installed without damaging the COR coordinator, such as a parallel arm closer or a non-fire-rated surface vertical rod strike.
- Stop mounted hardware will need to be lowered to compensate for the height of the coordinator and mounting bracket.
- MB mounting brackets are made of aluminum

Product	Jamb Depth	Stop Width	Dimensions
MB1	4-3/4" Min.	Over 2-1/2"	4" W x 3" D x 15/16" T
MB2	4-3/4" Min.	Up to 2-1/2"	4" W x 3-1/4" D x 1-5/8" T

Finishes

Ives Finish	USP	SP28	SPBLK
BHMA	600	689	622

MB1F, MB2F and MB3F
MB1V, MB2V and MB3V



MB1V



MB2V



MB3V

Fire Rated Mounting Brackets

- Allows for fire-rated stop mounted hardware to be properly installed without damaging the COR Coordinators, such as fire-rated surface vertical rod exit device strikes.
- Latch will need to be lowered to compensate for the height of the coordinator and mounting bracket.
- MB-V are designed for Von Duprin 8827-F soffit latch.
- Mounting brackets are made of steel.

Product	Jamb Depth	Stop Width	Dimensions
MB1F	5"	1-1/2" - 2-1/4"	4" W x 3" D x 1-5/8" T
MB1V	5"	1-1/2" - 2-1/4"	4" W x 3" D x 1-5/8" T
MB2F	5-7/8"	2-3/8" - 3-1/4"	4"W x 4" D x 1-5/8"T
MB2V	5-7/8"	2-3/8" - 3-1/4"	4"W x 4" D x 1-5/8"T
MB3F	6-7/8"	Over 3-3/8"	4"W x 3-1/2" D x 1"T
MB3V	6-7/8"	Over 3-3/8"	4"W x 3-1/2" D x 1"T

Finishes

Ives Finish	USP	SP28	SPBLK
BHMA	600	689	622

COR7G and COR9G

Gravity Coordinators



Meets ANSI/BHMA A156.3, Type 21.
UL Listed for Fire Doors.

- When active door is open, coordinator prevents active door from closing until inactive door bypasses. Closing of inactive door causes strike plate on top of door to contact cam and lift arm, allowing active door to close. As inactive door continues closing, roller rides over strike plate on to door bracket, holding arm above active door.
- Non-handed.
- Gravity action arm and door bracket are adjustable on the job for ease of installation. Rubber roller provides quiet and efficient operation, and helps protect the astragal and doors from damage.
- Nylon roller on short arm glides smoothly over door bracket and strike, ensuring silent operation.
- Made of forged brass.
- COR7G for use on pairs of doors with astragal on active door up to 4' or with astragal on inactive door up to 3'4" or with astragal on both doors up to 2'10"
- COR9G for use on pairs of doors with astragal on active over 4' or with astragal on inactive door over 3'4" or with astragal on both doors over 2'10"

Product	Projection
CORG7G	7"
CORG9G	9"

Finishes

Ives Finish	US3	US4	US10	US10B	US26	US26D
BHMA	605	606	612	613	625	626

CB1 Carry Bar



Meets ANSI/BHMA A156.3, Type 21.

- Used when it is possible for the inactive door to be opened before the active door.
- Prevents damage to the doors and other hardware.
- Nylon roller insures quiet and efficient operation.
- Non-handed.
- All-steel construction.
- Standard sex bolts for mounting.

Finishes

Ives Finish	US3	US4	US10	US10B	US26	US26D	SPBLK	USP
BHMA	605	606	612	613	625	626	622	600

How to Order COR and Accessories

COR 52 US28 FL20 D 36"

COR Size:
32, 42, 52, 60, 72

Finishes:
US28, US26D, 315AN

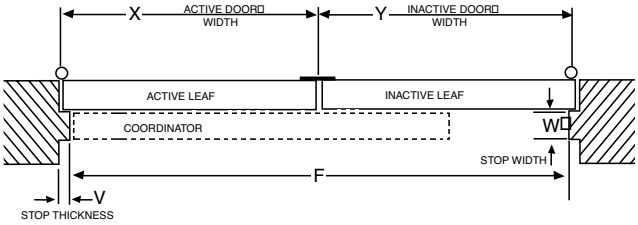
Filler Bar (if desired):
FL20, FL32, FL44

Vertical Rod Exit Device Cutout Type (if applicable):
A, B, C, D, E, F, G
If other Vertical Rod Exit Device not listed on chart, from page C16, include information as shown on page C16.

Active Door Size – Required for ALL Vertical Rod Exit Device Applications

To determine the size COR you need:

1. Start with the active door width (X).
2. Next consider the overall frame opening between stops (F).
3. Preferably, the coordinator would equal the active door width (X) + approximately 1/2 inactive door width (Y). The coordinator must be 6" longer than the active door width (X) and less than the overall frame opening between stop (F).



Examples:

- Pair of 30" Doors, 5/8" Stops
  Active Door Size, X = 30"
  Overall Frame Opening between Stops, F = 58-3/4"
  Recommended Coordinator: COR42

- Pair of 36" Doors, 5/8" Stops
  Active Door Size, X = 36"
  Overall Frame Opening between Stops, F = 70-3/4"
  Recommended Coordinator: COR52

- 36" Active Door, 18" Inactive door, 5/8" Stops
  Active Door Size, X = 36"
  Overall Frame Opening between Stops, F = 52-3/4"
  Recommended Coordinator: COR42

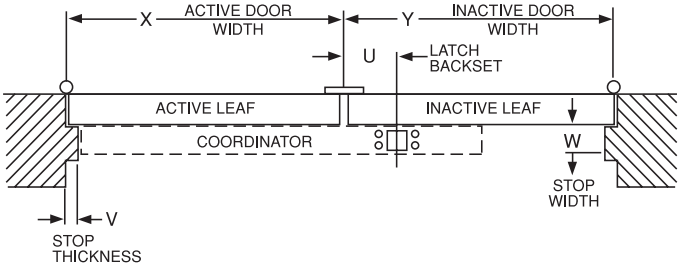
- 48" Active Door, 24" Inactive Door, 5/8" Stops
  Active Door Size, X = 48"
  Overall Frame Opening between Stops, F = 94-3/4"
  Recommended Coordinator: COR60

Special Factory Preparation for Use with Vertical Rod Exit Devices

Coordinators may need to be prepared at the factory for use with some surface or concealed vertical rod exit devices. (See Chart below)

If the exit device is not listed the following information is needed.

1. Exit Device Manufacturer and Model No.
2. Active Door Size, "X"
3. Inactive Door Size, "Y"
4. Exit Device Backset, "U"
5. Stop Width, "W"
6. Stop Thickness if other than 5/8", "V"



Exit Device Manufacturer	Exit Device Number	Device Backset	Maximum Active Door	Coordinator Size Needed	Coordinator Cutout Type	Mounting Bracket Needed
Von Duprin	5547-F	2-3/8"	33" 43" 51" 63"	42" 52" 60" 72"	Type A	None
Von Duprin	8827-F	2-3/4"	33" 43" 51" 63"	42" 52" 60" 72"	Type B	MB1V, MB2V or MB3V *see page C3*
Von Duprin	8847-F	2-3/8"	33" 43" 51" 63"	42" 52" 60" 72"	Type C	None
Von Duprin	33/3547 33/3547-F 98/9947 98/9947-F	2-3/4"	33" 43" 51" 64"	42" 52" 60" 72"	Type D	None
Von Duprin	33/3548 33/3548-F 98/9948 98/9948-F	2-3/4"	33" 43" 51" 64"	42" 52" 60" 72"	Type D	None
Von Duprin	33/3547WDC 33/3547WDC-F 98/9947WDC 98/9947WDC-F	1-5/16"	34" 44" 52" 65"	42" 52" 60" 72"	Type E	None
Falcon	17-C F-17-C 18-C F-18-C XX-C F-XX-C 24-C F-24-C 25-C F-25-C	2-3/4"	33" 43" 51" 63"	42" 52" 60" 72"	Type F	None
Falcon	17-C-WDC F-17-C-WDC 18-C-WDC F-18-C-WDC XX-C-WDC F-XX-C-WDC 24-C-WDC F-24-C-WDC 25-C-WDC F-25-C-WDC	2-13/16"	33" 43" 51" 63"	42" 52" 60" 72"	Type G	None

100 Series Concealed Overhead Door Holders/Stops



100 Series Heavy-Duty

Glynn-Johnson offers a complete line of overhead door holders and stops, accommodating virtually all openings with solutions for even the most complex door control problems. These concealed holders and stops provide the most attractive and reliable heavy-duty door control available.

Glynn-Johnson 100 series holders and stops provide the most reliable and versatile concealed overhead door control. They are designed for installation on virtually all types of doors mounted on conventional type butt hinges, pivots, continuous hinges, swing clear hinges and numerous other specialty hinges. When used in conjunction with many surface-applied door closers, 100 series holders and stops provide the most effective control for entrance doors and vestibule doors of all types, as well as heavy or often used interior doors. Templates provided allow for variable mounting positions, ranging from 85° - 110° of opening.

Five Models:
- 100H Series Hold-Open Model
- 100HP Series Internal Hold-Open Model
- 100F Series Friction Hold-Open Model
- 100S Series Stop-Only Model
- 100SE Series Special Stop-Only Model

Six Sizes:
- Each model comes in six sizes.
- Simple
- Standardized

Three Options:
- ADJ—Adjustable Jamb Bracket
- CJ—Jamb Bracket for use with LCN5030 Closer
- SOC—Pin-in-Socket Security Screw Package

Unmatched Convenience:
- Non-handed
- Improved Compatibility with Door Closers
- Single/Double-Acting Doors
- Interior/Exterior Applications
- Reduced Door Prep
- Durable
- Improved Corrosion Resistance
- Function Conversion Kits are Available.

Materials and Finishes:
In Heavy Gauge Brass or 300 Series Stainless Steel, these models offer the broadest range of finishes in the industry, complementing any design and offering the highest resistance to corrosion. Available in the following finishes:

Finishes	Description
US3	Polished Brass
US4	Satin Brass
US10	Satin Bronze
US10B	Oil Rubbed Bronze
US32	Polished Stainless Steel
US32D	Satin Stainless Steel
SP4	Powder Coat Brass
SP10	Powder Coat Bronze
SP28	Powder Coat Aluminum
SP313	Powder Coat Dark Bronze
SPBLK	Powder Coat Black

Models

These models provide a wide range of optional features, and are ideal for use on entrance and vestibule doors, large doors, doors opened frequently, or doors subject to abuse. These models are also furnished with an offset-style jamb bracket.

Designed for heavy-duty applications, 100 series models will provide long-lasting protection to doors, frames, hinges, related hardware and surrounding walls or obstructions.

100H Series Hold-Open

(Suffix H) The Hold-Open function should be used where it is desired to hold a door open at a predetermined position for short or long periods of time, permitting an unobstructed traffic flow through the opening.

These models are both selective and adjustable, featuring the most reliable Hold-Open mechanism available. They feature a control knob which protrudes from the face of the door and turns the Hold-Open function on or off. Set in the inactive position, the unit acts as a stop and shock absorber. The tension on the Hold-Open mechanism can be adjusted using an allen wrench to offset air currents or other exterior conditions. The Hold-Open tension adjustment is located in the bottom of the track in the top of the door.

100HP Series Internal Hold-Open

These models provide a Hold-Open unit with the Hold-Open mechanism built into the channel, thus reducing the door prep. The 100HP have a preset Hold-Open force that is not adjustable. The Hold-Open feature is not selectable in these units, so the doors are always held open.

100F Series Friction Hold-Open

(Suffix F) Friction Hold-Open models provide an alternative holding method, ideal for heavy patient room doors, closet doors or similar applications where multiple Hold-Open positions are desired. The friction tension is adjusted using an allen wrench and an open end wrench. The friction tension adjustment is located on the top of the slider in the channel.

100S Series Stop-Only

(Suffix S) When the Hold-Open function is not required, the Stop-Only function provides the same effective door control minus the Hold-Open feature. The Stop-Only model may be used on fire doors.

100SE Series Special Stop-Only

(Suffix SE) When Stop-Only models are used in conjunction with single point Hold-Open electronic door closers, they may be ordered without the shock-absorbing mechanism. Used as an auxiliary stop with these closers, they will prolong the life of the closer. The stop location is adjusted using an allen wrench on the stop block located in the channel.

Note: Caution should be used when using this option in other applications, as the elimination of the shock-absorbing spring can put added stress on door and frame if used improperly.

Application Information

UL Classification

The 100 series Stop-Only models are classified by Underwriters Laboratories (UL) as Miscellaneous Fire Door Accessories. This classification applies to use on either Hollow Metal Fire Doors or Wood Fire Doors. Where Wood Door manufacturer's listing allows for the cutout required for installation, concealed overhead stops may be used on those wood fire doors. These units may be used on doors of any rating. As a reminder, the Miscellaneous Fire Door Accessories (GVUX) section is defined by UL as: "Miscellaneous fire door accessories are intended in the individual Listings. The accessories have been investigated to determine that when installed in accordance with the manufacturer's instructions, the accessories do not adversely affect the fire rating of the fire door and/or fire door frames."

Dead Stop Templating:

If a wall or similar obstruction is in place at 110° or less opening angle (i.e. doors that open back-to-back), Dead Stop Templating should be used. This includes all Hold-Open, Friction and Stop-Only models, except when the "SE" Option is used. The Dead Stop position is reached when the shock-absorbing spring is fully compressed, the initial degree of opening will be 5° to 7° less than the Dead Stop opening.

Example: If the holder is templated to 100° Dead Stop, the door will hold open somewhere between 93° and 95°, but no further than 100°.

Note: Do not use dead-stop templating on the 100SE Series since there is no shock-absorbing spring.

Environmental Considerations:

Environmental factors should always be considered when specifying overhead holders and stops. Doors that are positioned on a building's exterior or subject to corrosive conditions should be equipped with a holder constructed primarily of stainless steel or brass materials. For interior applications, steel is acceptable, though brass substrates generally provide a more attractive architectural-grade finish.

Function Conversion Kits

- FK100F—Converts a 100H or 100S unit into a 100F unit. To order specify FK100F.
- FK100H—Converts a 100F or 100S unit into a 100H unit. To order specify FK100H.
- No kit is needed to convert a 100H or 100F unit into a 100S unit.

Options

Suffix ADJ (Adjustable Jamb Bracket):

An additional option on the 100 series is the adjustable jamb bracket, which allows the degree of Hold-Open or Stop angle to be adjusted after installation. Suffix "ADJ" is available in all functions, but only in sizes 3, 4, 5 & 6. ADJ jamb bracket requires additional frame prep. The ADJ option cannot be added to an existing unit, it must be factory ordered.

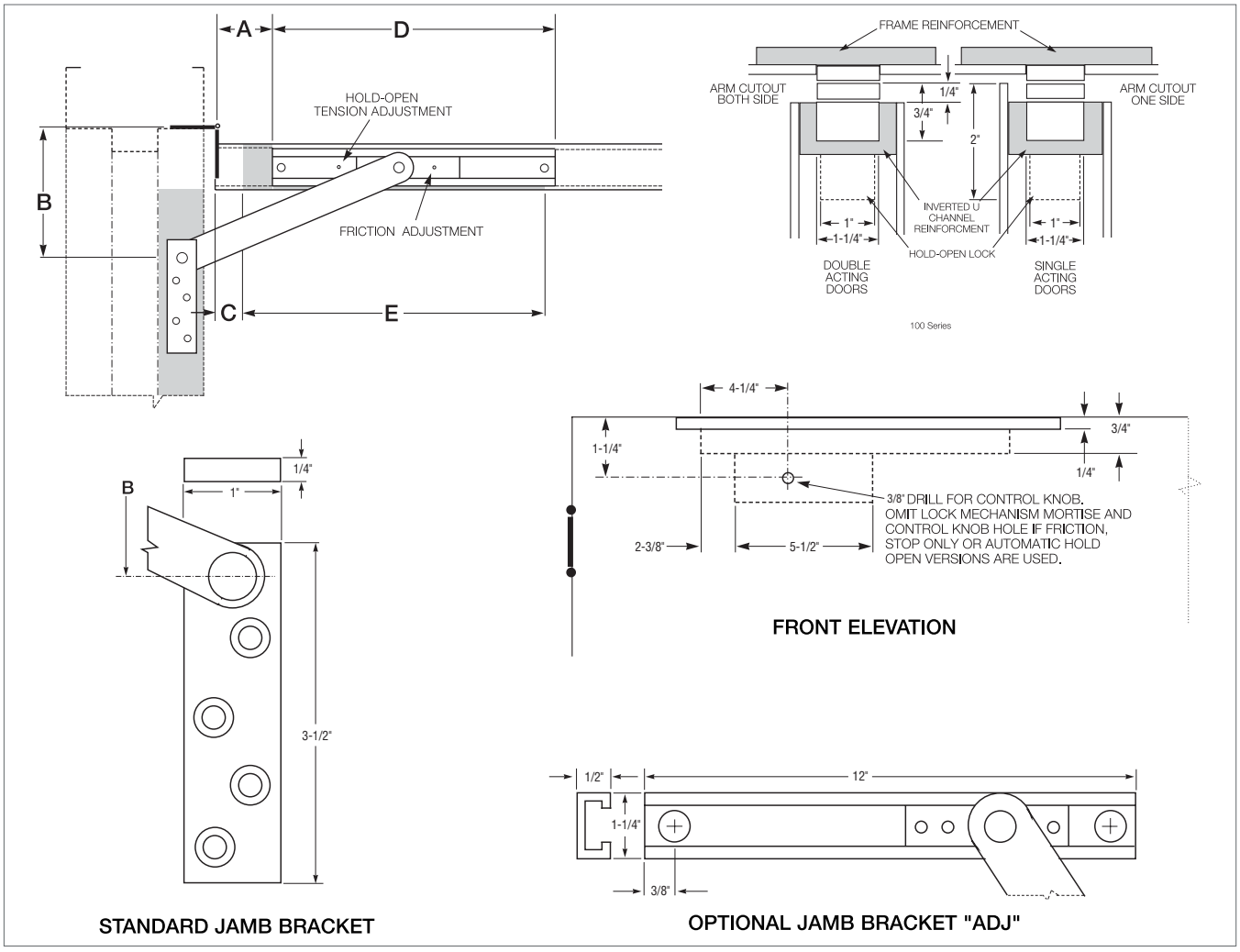
Suffix CJ (Closer Jamb Bracket):

Provides a special jamb bracket needed for 100 series units used with LCN5030 closers. These special jamb brackets are handed, so handing will need to be specified when ordering the "CJ" option, CJLH for a left hand door and CJRH for a right hand door. The CJ option cannot be added to an existing unit, it must be factory ordered.

Suffix SOC (Pin-in-Socket Security Screw Package):

A screw package with pin-in-socket screws for mounting the jamb bracket to the frame is provided instead of the standard screw package.

100 Series Concealed Overhead Door Holders/Stops



100 Series Sizing Chart								
BUTTS/OFFSET PIVOTS					**CENTER HUNG**			
SIZE	**DOOR OPENING**	**STOP ONLY**	**HOLD OPEN**	**FRICTION**	**DOOR OPENING**	**STOP ONLY**	**HOLD OPEN**	**FRICTION**
1	18"–23"	101S*	101H*	101F*	-----	----	----	----
2	23-1/16"–27"	102S*	102H*	102F*	-----	-----	-----	-----
3	27-1/16"–33"	103S	103H	103F	33-1/16"–39"	103S	103H	103F
4	33-1/16"–39"	104S	104H	104F	39-1/16"–45"	104S	104H	104F
5	39-1/16"–45"	105S	105H	105F	45-1/16"–51"	105S	105H	105F
6	45-1/16"–54"	106S	106H	106F	51-1/16"–59"	106S	106H	106F

Note: This chart illustrates the most common types of hinging and door opening sizes. For unusual door details, contact Glynn-Johnson for availability.

**These sizes are not available for use with offset pivots. Also not available with the ADJ option.*

BHMA/ANSI, A156.8 & FED. Spec. Cross Reference		
G-J Model	**BHMA***	**FED. Spec.**
101-106 H	C01511	1160
101-106 S	C01541	----
101-106 F	C01531	----

** First numeral (0) designates optional material.*

To specify:
Brass material, change 0 to 1 (i.e. C11511)
Stainless Steel material, change 0 to 5 (i.e. C51511)

BHMA

All 100 series models are designed for heavy-duty applications and far exceed BHMA cycle test and force test requirements for Grade 1 holders and stops.

The template information on this page is for reference only and is not intended to serve as an installation template. For complete dimensional information, refer to Glynn-Johnson template book.



How to Order

10 4 H – US26D – ADJ

Overhead Series:
- **10**

Size (Door Opening Using Butts or Offset Pivots:
- **1** (18"–23")
- **2** (23-1/16"–27")
- **3** (27-1/16" –33")
- **4** (33-1/16"–39")
- **5** (39-1/16"–45")
- **6** (45-1/16"–54")

Function:
- **H** Hold-Open
- **HP** Internal Hold-Open
- **F** Friction Hold-Open
- **S** Stop-Only
- **SE** Special Stop-Only

Finishes:
- **US3** Polished Brass
- **US4** Satin Brass
- **US10** Satin Bronze
- **US10B** Oil Rubbed Bronze
- **US32** Polished Stainless Steel
- **US32D** Satin Stainless Steel
- **SP4** Powder Coat Brass
- **SP10** Powder Coat Bronze
- **SP28** Powder Coat Aluminum
- **SP313** Powder Coat Dark Bronze
- **SPBLK** Powder Coat Black

Options:
- **ADJ** Adjustable Jamb Bracket
- **CJLH** Special Jamb Bracket for LCN 5030 Closer, LH Door
- **CJRH** Special Jamb Bracket for LCN 5030 Closer, RH Door
- **SOC** Pin-in-Socket Security Screws

LCN®

Surface mounted closer

4010 Series



Overview

The 4010 is LCN's best performing heavy duty closer designed specifically for institutional and other rugged high traffic applications.

Cylinder

4011(6)-3071
Cast iron cylinder assembly

Handing
Handed

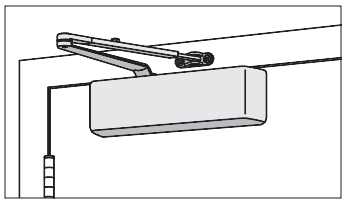
Sizing
Adjustable 1-5 or sized 6

- 4011 (adjustable from size 1 to 5)
- 4016 (Size 6, DEL not available)

Available cylinder options

DEL	Delayed action cylinder

Mounting



Hinge (pull side)

ALLEGION™

Finishes

Powder coat finishes

689
Aluminum

690
Statuary Bronze

691
Light Bronze

693
Black

695
Dark Bronze

696
Brass

150+ additional custom colors available using the RAL numbering system

Metal plated finishes

632
Bright Brass

633
Satin Brass

639
Satin Bronze

616
Satin Bronze, Blackened

646
Satin Nickel

651
Bright Chrome

652
Satin Chrome

Available finish options

MTLPC	Brite metallic: Custom powder coat finish, which resembles that of 651 or 652 plated finish.
SRI	For installations where a higher level of protection against weather conditions, or the effects of a potentially corrosive atmosphere is required, LCN offers a special rust inhibiting (SRI) process. Ferrous metal components receive an SRI pretreatment and a standard powder coat finish of your choice, or a custom powder coat finish for a nominal additional cost. Closers treated with the SRI process exceed the 100 hour protection level available with standard LCN powder coated finishes.

Covers

Standard cover



4010-72
Plastic cover
- Non-handed

Optional cover



4010-72MC
Metal cover
- Handed
- Required for plated finishes and custom powder coat finishes
- Optional

Arms



4010-3077
Regular arm
- Non-handed



4010-3049
Hold-open arm
- Handed
- Provides hold-open function, adjustable at elbow
- Optional



4010-3049FL
Fusible link arm
- Handed
- Releases hold-open function when exposed to temperatures above 165º F. 1/8″ (3 mm) maximum reveal
- Optional
- NOTE: Check local codes before specifying FL arms. NOT A life safety product!

Installation accessories



4010-18
Plate
- Required where top rail is less than 3 3/4" (95 mm)
- Requires minimum 2" (51 mm) top rail

Fasteners

Self-reaming and tapping screws included standard

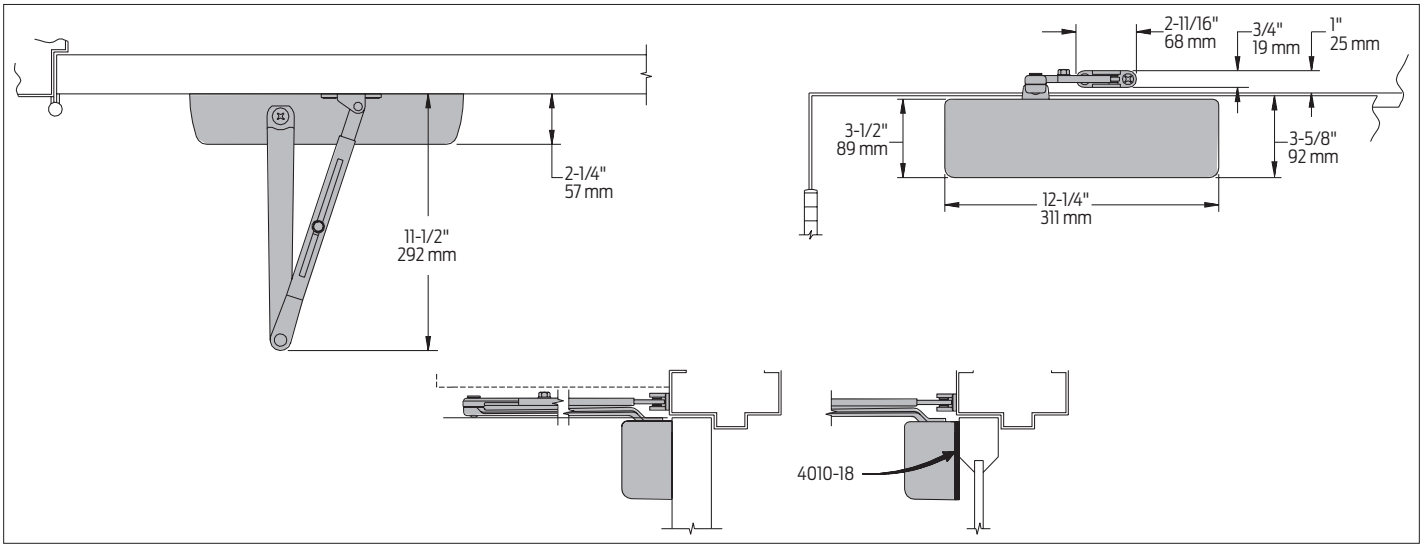
Fastener pack options

TBSRT	TB[1] with self-reaming and tapping screws
WMS	Wood and machine screw
TBWMS	TB[1], wood and machine screw
TORX	TORX machine screw
TBTRX	TB[1] and TORX machine screw

1 Specify door thickness if other than 1 3/4"

Dimensions and mounting

Hinge (pull) side mounting



Specifications

Accessibility	Available with less than 5.0 lbs. opening force on 36" door
Certifications/ approvals	▪ Grade 1 - ANSI A156.4 ▪ UL 10C ▪ Meets BAA - Buy American Act
Degree of operation	Hinge (pull) side Max opening: 140° Hold open: 140°
Environmental conditions	▪ Approved for interior use ▪ Approved for exterior use (SRI coated only) ▪ LCN's standard all weather fluid performs to temperature ranges from 120°F (49°C) to -30°F (-35°C) ▪ LCN's powder coat finish surpasses 100 hours of salt spray which is over four times the ANSI standard for corrosion resistance.
Warranty	30 years
Standard features	▪ Cast iron body ▪ Full complement bearing ▪ 1 1/2" diameter piston ▪ 11/16" diameter double heat treated pinion journal

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ALLEGION™

LCN®

Surface mounted closer

4110 Series



Overview

The 4110 is LCN's best performing heavy duty closer with an adjustable spring and possible hold-open point beyond 140 degrees, meeting ADA requirements. Backed by a 30 year warranty, the cast iron body and all weather fluid offer versatility in high traffic applications.

Cylinder

4111(6)-3071
Cast iron cylinder assembly

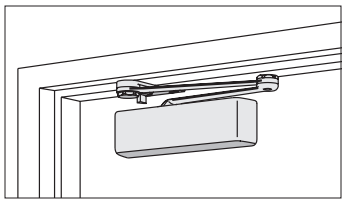
Handing
Handed

Sizing
Adjustable spring size 1-5, or sized 6
Includes patented Green Dial
- 4111 (adjustable from size 1 to 5)
- 4116 (Size 6; DEL, SHCUSH or HCUSH arm not available)

Available cylinder options

DEL	Delayed action cylinder
AVB	Advanced variable backcheck

Mounting



Parallel arm (push side)

ALLEGION™

Finishes

Powder coat finishes

689
Aluminum

690
Statuary Bronze

691
Light Bronze

693
Black

695
Dark Bronze

696
Brass

150+ additional custom colors available using the RAL numbering system

Metal plated finishes

632
Bright Brass

633
Satin Brass

639
Satin Bronze

616
Satin Bronze, Blackened

646
Satin Nickel

651
Bright Chrome

652
Satin Chrome

Available finish options

MTLPC	Brite metallic: Custom powder coat finish, which resembles that of 651 or 652 plated finish.
SRI	For installations where a higher level of protection against weather conditions, or the effects of a potentially corrosive atmosphere is required, LCN offers a special rust inhibiting (SRI) process. Ferrous metal components receive an SRI pretreatment and a standard powder coat finish of your choice, or a custom powder coat finish for a nominal additional cost. Closers treated with the SRI process exceed the 100 hour protection level available with standard LCN powder coated finishes.

Covers

Standard cover



4110-72
Plastic cover
- Non-handed
- Standard

Optional cover



4110-72MC
Metal cover
- Handed
- Required for plated finishes and custom powder coat finishes
- Optional

Arms



4110-3049EDA
Hold-open arm
- Handed
- Optional
- Provides hold-open function, adjustable at shoe



4110-3049FL
Fusible link arm
- Handed
- Releases hold-open function adjustable at shoe when exposed to temperatures above 165º F
- Optional
- NOTE: Check local codes before specifying FL arms. NOT A life safety product!



4110-3077CNS
Cush-N-Stop arm
- Non-handed
- Features solid forged steel main arm and forearm with built-in stop in soffit shoe



4110-3077EDA
Extra duty arm
- Non-handed
- Features forged, solid steel main and forearm for potentially abusive installations



4110-3077EDA/ 62G
Extra duty arm
- Non-handed
- Features forged, solid steel main and forearm for potentially abusive installations
- Optional 4110-62G thick hub shoe for blade stop clearance



4110-3049CNS
HCUSH arm
- Non-handed
- Provides hold-open function with templated stop/ hold-open points.
- Handle controls hold-open function



4110-3077SCNS
Spring CUSH arm
- Non-handed
- For abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Optional



4110-3049SCNS
Spring HCUSH arm
- Non-handed
- For abusive applications features solid forged steel main arm and forearm with spring loaded stop in the soffit shoe
- Handle controls hold-open function
- Optional

Installation accessories



4110-18
Plate
- Required for push side mount where top rail is less than 5 1/8″ (130 mm), measured from the stop
- Requires minimum 2″ (51 mm) minimum top rail



4110-30
CUSH shoe support
- Provides anchorage for fifth screw used with CUSH arm, where reveal is less than 3 1/16″ (78 mm)



4110-61
Blade stop spacer
- Lowers parallel arm shoe to clear 1/2″ (13 mm) blade stop



4110-419
PA flush panel adapter
- Provides horizontal mounting surface for CUSH shoe on single rabetted or flush frame

Fasteners

Self-reaming and tapping screws included standard

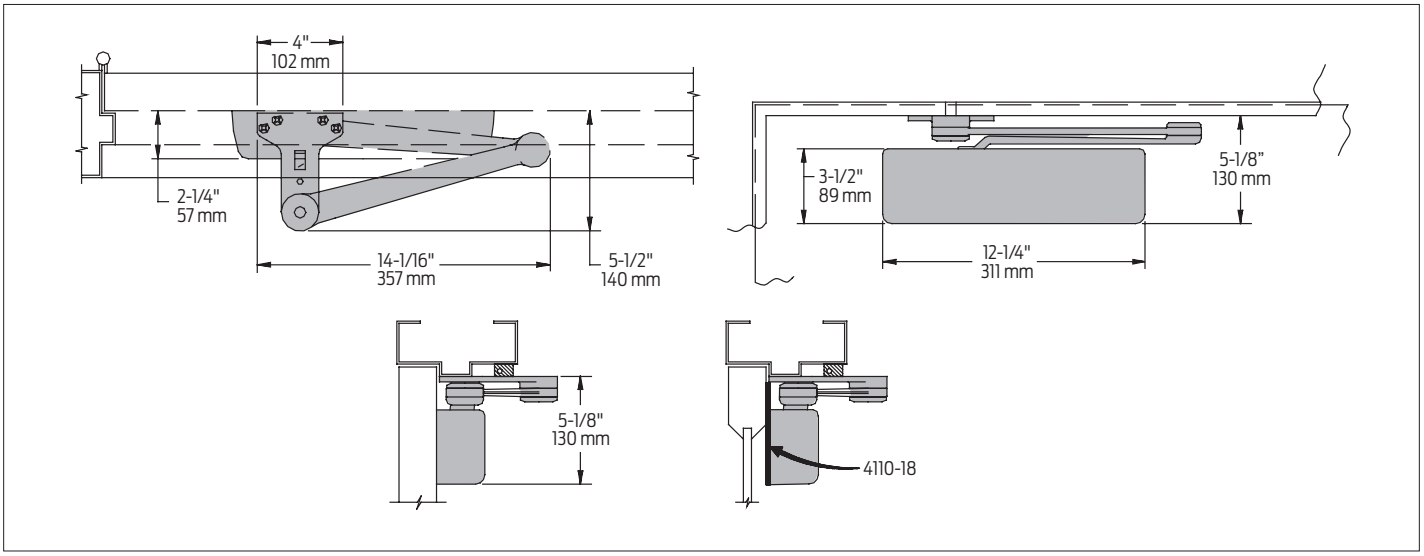
Fastener pack options

TBSRT	TB[1] with self-reaming and tapping screws
WMS	Wood and machine screw
TBWMS	TB[1], wood and machine screw
TORX	TORX machine screw
TBTRX	TB[1] and TORX machine screw

1 Specify door thickness if other than 1 3/4"

Dimensions and mounting

Parallel arm (push side) mounting



Specifications

Accessibility	Available with less than 5.0 lbs. opening force on 36" door
Certifications/ approvals	▪ Grade 1 - ANSI A156.4 ▪ UL 10C ▪ Meets BAA - Buy American Act
Degree of operation	EDA Max opening: 180° Hold open: 180° Cush Max opening: 110° Hold open: 110°
Environmental conditions	▪ Approved for interior use ▪ Approved for exterior use (SRI coated only) ▪ LCN's standard all weather fluid performs to temperature ranges from 120°F (49°C) to -30°F (-35°C) ▪ LCN's powder coat finish surpasses 100 hours of salt spray which is over four times the ANSI standard for corrosion resistance.
Warranty	30 years
Standard features	▪ Cast iron body ▪ Full complement bearing ▪ 1 1/2" diameter piston ▪ 11/16" diameter double heat treated pinion journal

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ALLEGION™

LCN®

Surface mounted closer

4020 Series



Overview

The 4020 is a heavy duty closer with adjustable spring power using the LCN Green Dial. This creates a custom fit to meet the specific demands of high traffic use and brings reliable performance.

Cylinder

4021(6)-3071
Cast iron cylinder assembly

Handing
Handed

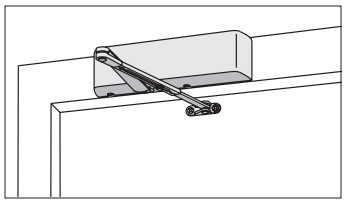
Sizing
Adjustable 1-5 or sized 6

- 4021 (adjustable from size 1 to 5)
- 4026 (Size 6, DEL not available)

Available cylinder options

DEL	Delayed action cylinder

Mounting



Top jamb (push side)

ALLEGION™

Finishes

Powder coat finishes

689
Aluminum

690
Statuary Bronze

691
Light Bronze

693
Black

695
Dark Bronze

696
Brass

150+ additional custom colors available using the RAL numbering system

Metal plated finishes

632
Bright Brass

633
Satin Brass

639
Satin Bronze

616
Satin Bronze, Blackened

646
Satin Nickel

651
Bright Chrome

652
Satin Chrome

Available finish options

MTLPC	Brite metallic: Custom powder coat finish, which resembles that of 651 or 652 plated finish.
SRI	For installations where a higher level of protection against weather conditions, or the effects of a potentially corrosive atmosphere is required, LCN offers a special rust inhibiting (SRI) process. Ferrous metal components receive an SRI pretreatment and a standard powder coat finish of your choice, or a custom powder coat finish for a nominal additional cost. Closers treated with the SRI process exceed the 100 hour protection level available with standard LCN powder coated finishes.

Covers

Standard cover



4020-72
Plastic cover
- Handed
- Standard

Optional cover



4020-72MC
Metal cover
- Handed
- Required for plated finishes and custom powder coat finishes
- Optional

Arms



4020-3077
Regular arm
- Non-handed



4020-3077L
Long arm
- Non-handed
- Includes 4020-79LR for deep reveals.
- Optional



4020-3049
Hold-open
- Handed
- Provides hold-open function, adjustable at elbow
- 5 3/4″ (146 mm) maximum reveal, 140° hold open
- Optional



4020-3049FL
Fusible link
- Handed
- Releases hold-open function, adjustable at shoe, when exposed to temperatures above 165° F
- 3 7/8″ (98 mm) maximum reveal
- Optional
- NOTE: Check local codes before specifying FL arms. NOT A life safety product!

Installation accessories



4020-18
Plate
- Required where head frame is less than 3 7/16″ (87 mm)
- Requires minimum 1 3/4″ (44 mm) minimum head frame and 2″ (51 mm) top rail 3 7/8″ (98 mm) maximum reveal



4020-18G
Plate
- For flush ceiling condition
- Requires minimum 1 3/4″ (44 mm) minimum head frame and 2 3/4″ (70 mm) top rail

Fasteners

Self-reaming and tapping screws included standard

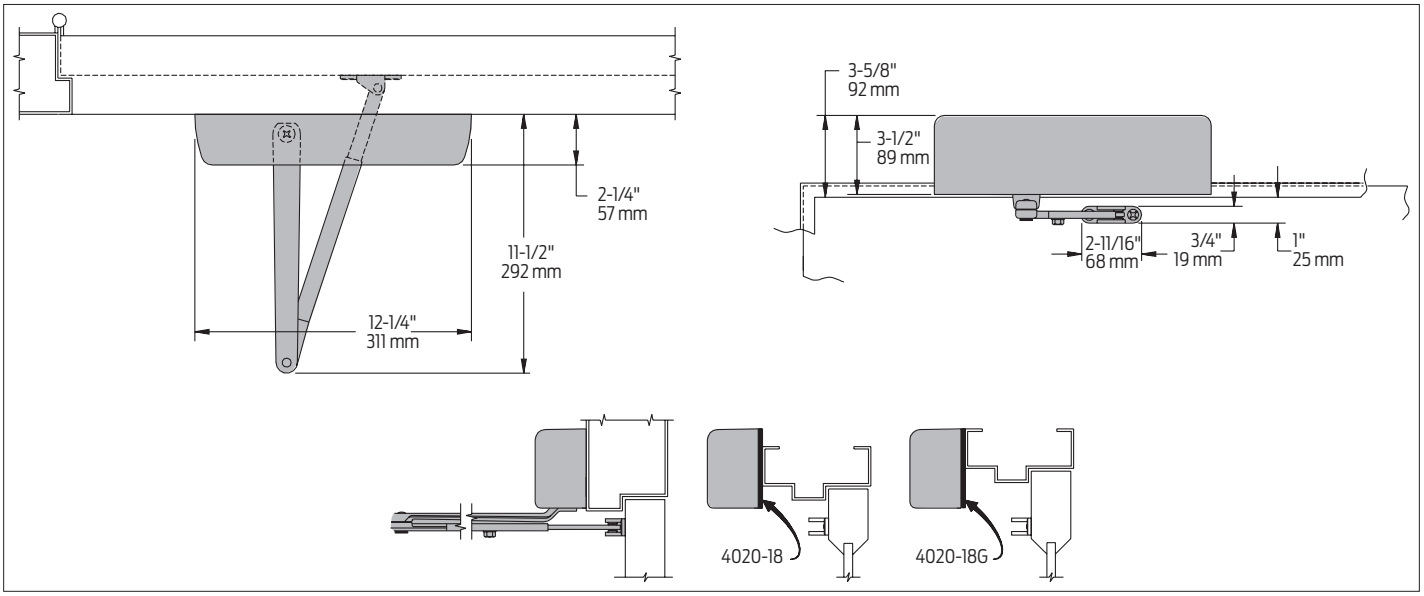
Fastener pack options

TBSRT	TB[1] with self-reaming and tapping screws
WMS	Wood and machine screw
TBWMS	TB[1], wood and machine screw
TORX	TORX machine screw
TBTRX	TB[1] and TORX machine screw

1 Specify door thickness if other than 1 3/4"

Dimensions and mounting

Top jamb (push side) mounting



Specifications

Accessibility	Available with less than 5.0 lbs. opening force on 36" door
Certifications/ approvals	▪ Grade 1 - ANSI A156.4 ▪ UL 10C ▪ Meets BAA - Buy American Act
Degree of operation	Hinge (pull) side Max opening: 180° Hold open: 140°
Environmental conditions	▪ Approved for interior use ▪ Approved for exterior use (SRI coated only) ▪ LCN's standard all weather fluid performs to temperature ranges from 120°F (49°C) to -30°F (-35°C) ▪ LCN's powder coat finish surpasses 100 hours of salt spray which is over four times the ANSI standard for corrosion resistance.
Warranty	30 years
Standard features	▪ Cast iron body ▪ Full complement bearing ▪ 1 1/2" diameter piston ▪ 11/16" diameter double heat treated pinion journal

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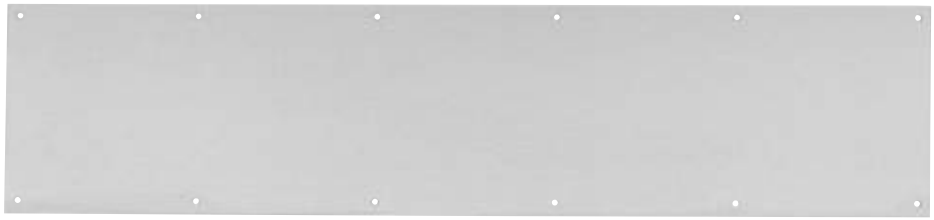
ALLEGION™

8400 Series Protection Plates

- Door protection plates are available in .050" thick brass, stainless steel or aluminum; and 1/8" thick high impact polyethylene in clear or black.
- Bevel edge options; specify B4E for all four edges.
- Mounting screw pack furnished standard, 16 screws per pack. Optional screw packs are available for TEK or TORK screw heads. Refer to the following chart for ordering.
- Specify NMH for no mounting holes. (Not available on 8402)
- Specify NMH-A for no mounting holes with adhesive. (Not available on 8402)
- Specify CS for counter sunk mounting holes.
- Specify ERS prepped with extra row of screws.

Kickplate Gasket Tape Tape is recommended when using a brass plate on a metal door to reduce tarnishing from electrolytic oxidation. One tape pack will cover an the perimeters of a 8" x 34" kickplate. Order 8401 Gasket Tape.



8400 Protection Plate
8402 (UL)* Protection Plate

**UL mark appears in upper right corner. Factory supplied screws must be used.*

Number of screw packs required by plate size (specify TEK Screws or TORK screws).

	22"-25"	26"-33"	34"-41"	42"-48"
4"-8"	1	1	1	1
9"-16"	1	1	1	1
17"-24"	1	1	1	2
25"-32"	1	1	2	2
33"-40"	1	2	2	2
41"-48"	2	2	2	2

Finishes *brass 24" x 48" max. size*

US Number	US3	US4	US10	US10B	US15	US26	US26D
BHMA	605	606	612	613	619	625	626

Finishes *stainless steel*

US Number	US32	US32D
BHMA	629	630

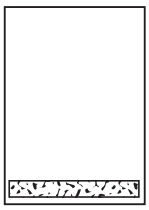
Finishes *aluminum*

US Number	US28
BHMA	628

Finishes *plastic*

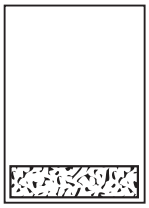
Clear and Black

Residential Grade Kickplates available Carded only, finishes PA28, PA3, PA619, PA716, B3, B505, B619, B716



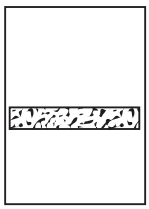
Mop Plates

- Protect the bottom of the pull side of door subject to cleaning and mopping procedures.
- Size Ranges:4" to 6" high, 22" to 48" wide



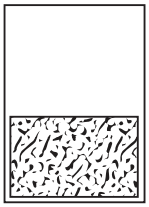
Kick Plates

- Protect the bottom of the push side of doors subject to scuffing from foot traffic.
- Recommended for all doors subject to normal use (especially doors using a closer).
- Size Ranges: 8" to 24" high, 22" to 48" wide



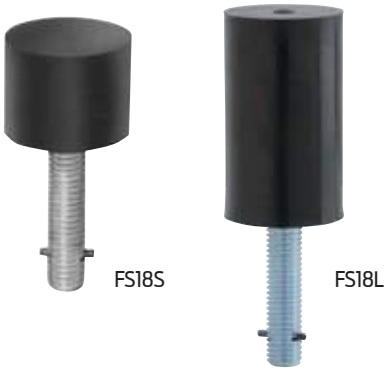
Stretcher Plates

- Protect doors at specific areas where consistent contact is made by stretchers, service carts or other equipment.
- Usually applied to push side of doors.
- Specify "B4E" Option for beveled edges.
- Size Ranges: 6" to 8" high, 22" to 48" wide



Armor Plates

- Protect lower half of doors from abuse by hard carts, trucks and rough usage.
- Usually applied to push side of single doors and both sides of double acting doors.
- Size Ranges: 26" to 48" high, 22" to 48" wide



FS18S
FS18L Floor Stops

- Security Door Stops designed for use in high vandalism areas.
- Molded from black flame resistant, resilient material around a heavy-duty stud.
- Once grouted in concrete, leaves no exposed fasteners to be tampered with or removed.
- Ideal for jail or security cell areas where floor mounted stops are required.
- FS18L also ideal for concrete wall applications.

Dimensions

FS18S Height: 1-1/2”
FS18S Diameter: 2”
FS18S Stud Length: 2-1/2”

FS18L Height: 3-1/2”
FS18L Diameter: 2”
FS18L Stud Length: 2-1/2”



FS434 Floor Stop

- Burnished wrought steel.
- For undercut doors up to 1-1/2”.
- Packed with screws and plastic anchors.
- Replaceable soft, resilient gray rubber.

Dimensions

Overall Height: 2-5/8”
Base Size: 1-1/2” W x 2-3/4” L

Finishes

Ives Number	USC
BHMA	604



430 Floor Door Stop

- Burnished wrought steel.
- For undercut doors up to 1-1/2”.
- Packed with screws and plastic anchors.
- Replaceable soft, resilient gray rubber.

Dimensions

Overall Height: 1-5/16”
Base Diameter: 1-1/4”

Finishes *brass*

Ives Number	B3	B4	B5	B10B	B15	B26	B26D
BHMA	605	606	609	613	619	625	626

Finishes *aluminum*

Ives Number	A3*	A5	A14	A92
BHMA	666		669	673

** only available in Slim-Pak of 25*



Meets ANSI/BHMA 156.16, L11241.

FS9 Floor Stop & Semi-Automatic Holder

- Semi-automatic floor-mounted holders accommodates with door to floor clearance of 1-1/2" or less.
- Cast from heavy-duty brass.
- Activate holder by flipping the engagement tongue forward. When door is opened, the hook (mounted on door) engages the tongue. To release, push firmly on door to disengage tongue.
- Universal screw pack accommodates all types of floor and door construction.

Dimensions

Overall Height: 3-1/2
Base Dimensions: 2" wide x 3-1/2" long

Finishes

Ives Number	US3	US4	US10	US10B	US26	US26D
BHMA	605	606	612	613	625	626



Meets ANSI/BHMA 156.16, L11301

FS40 FS41 FS42 FS43 Floor Stop & Automatic Holder

- Automatic door holders ideal for heavy-traffic situations that require a simple, fool-proof, Hold-Open device.
- Forged from brass.
- Unit is activated automatically when door is opened. A firm pull on door releases the mechanism.
- Strikes accommodate different door to floor clearances.
- Model numbers are determined by strike/door-to-floor clearances.
- Holder position on door is adjustable.
- Universal screw pack allows for installation in all types of door construction.

Dimensions

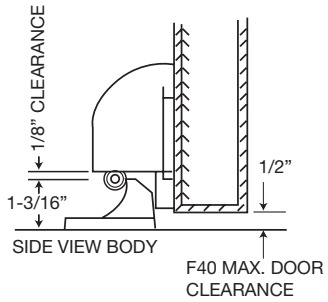
Door to Floor Clearance:

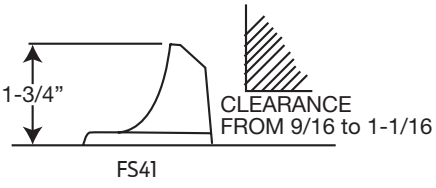
FS40	1/2" or less
FS41	9/16" to 1-1/16"
FS42	1-1/8" to 1-9/16"
FS43	1-5/8" to 2-1/16"

Holder Dimensions: 3" Wide x 3-11/16" High

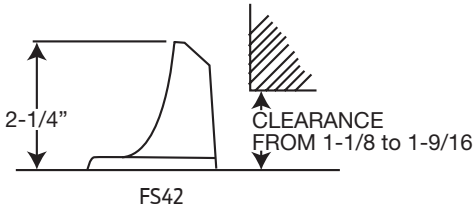
Finishes *brass*

Ives Number	US3	US4	US10	US10B	US26	US26D
BHMA	605	606	612	613	625	626





FS41



FS42



FS43



WS406CVX & WS407CVX
Meets ANSI/BHMA 156.16 L22201 for brass, and L52101 for stainless steel.

WS406CCV & WS407CCV
Meets ANSI/BHMA 156.16 L22251 for brass and and L52251 for stainless steel.

WS406CVX Wall Bumpers
WS406CCV
WS407CVX
WS407CCV

- Constructed in sturdy yet economical wrought base of brass or stainless steel construction.
- Feature concealed tamper-proof mounting.
- Shipped factory preassembled backplate to reduce installation cost.
- Easy installation by inserting screwdriver through small hole in rubber.

WS406CVX (406) – convex rubber bumper, packed with wood screw and plastic anchor.
WS406CCV (406-1/2) – concave rubber bumper, which avoids damage to locks with projecting buttons, packed with wood screw and plastic anchor.
WS407CVX (407) – convex rubber bumper packed with screw and drywall anchor.
WS407CCV (407-1/2) – concave rubber bumper which avoids damage to locks with projecting buttons and is packed with screw and drywall anchor.

Dimensions

Base Diameter: 2-1/2"
Base Thickness: 3/8"
Overall Projection: 1"

Finishes *brass*

Ives Number	US3	US4	US5*	US10	US10B	US15	US15A**	US26	US26D	B716**
BHMA	605	606	609*	612	613	619	620	625	626	

Finishes *stainless steel*

Ives Number	US32D
BHMA	630

** only available on WS407CVX Slim-Pak of 15*

*** available on WS407CCV or WS407CVX Slim-Pak of 15*

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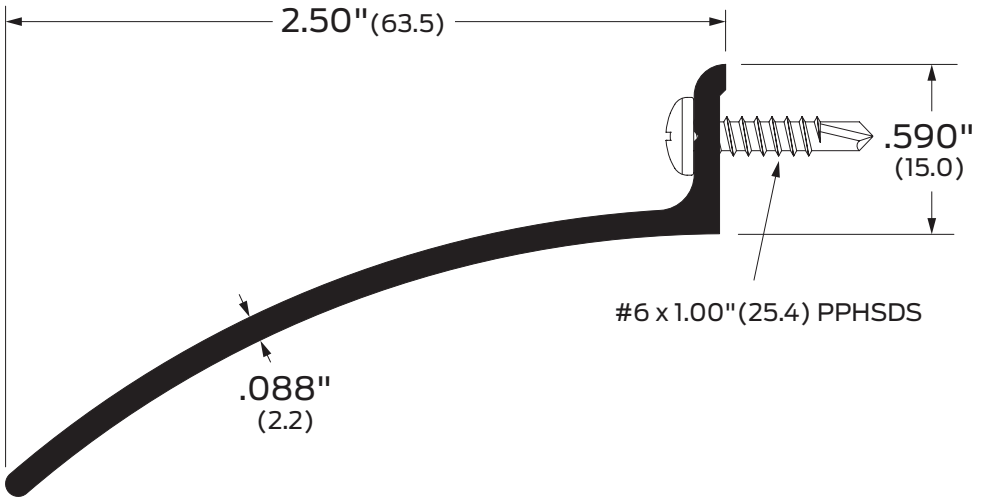
Part No:	Part description:
142 Rain drip	Accessories & options

Notes:	Provided by:	
Customer name:	Job no:	Date:

Image may not be shown to scale



Certifications:

Fire rated-UL10c

ANSI/BHMA:

142AA, 142BK, 142D, 142G R3Y976

BHMA CERTIFIED

Finishes:

AA	Aluminum clear anodized
BK	Aluminum black anodized
D	Aluminum dark bronze anodized
G	Aluminum gold anodized

Options:

SEC	Security screws

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Part No: 188S

Part description: Self-adhesive weatherstripping

Notes:

Provided by:

Customer name:

Job no:

Date:

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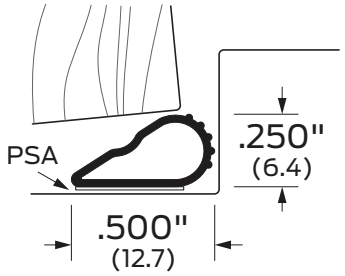

Notes:
PSA standard. 20-minute fire rating.

Certifications:

- Fire rated-UL10c
- Smoke and draft control
- Air Infiltration
- Sound

ANSI/BHMA:

188S R0E151

BHMA CERTIFIED

Finishes:

BK	Black
BR	Brown
CL	Clear
GY	Gray
WH	White

Options:

ZAG	Ligature resistant gasketing

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Part No:	Part description:
429	Head & jamb gasketing

Notes:	Provided by:	
Customer name:	Job no:	Date:

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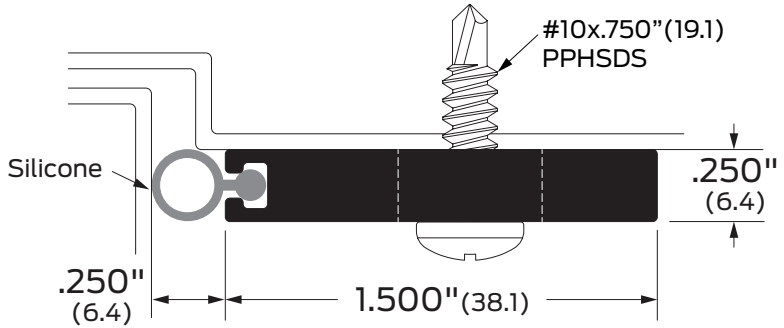

Notes:
Gasketing protection for closer bracket or door coordinator.

Certifications:

- Fire rated-UL10c
- Smoke and draft control

ANSI/BHMA:

429AA, 429BK, 429D, 429G R3E164

BHMA CERTIFIED

Finishes:

AA	Aluminum clear anodized
BK	Aluminum black anodized
D	Aluminum dark bronze anodized
G	Aluminum gold anodized

Options:

S	Order as a set
SEC	Security screws

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Part No:	Part description:
8780N	Self-adhesive weatherstripping

Notes:	Provided by:	
Customer name:	Job no:	Date:

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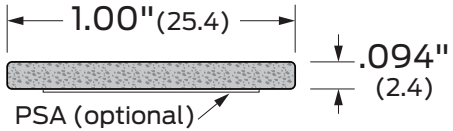

Notes:
Mullion seal

Certifications:
- Fire rated-UL10c
- Smoke and draft control

ANSI/BHMA:
8780N R0C155

BHMA CERTIFIED

Finishes:
BK Black

Options:
PSA Pressure-sensitive adhesive
ZAG Ligature resistant gasketing

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Part No:	Part description:
383	Meeting stile

Notes:	Provided by:	
Customer name:	Job no:	Date:

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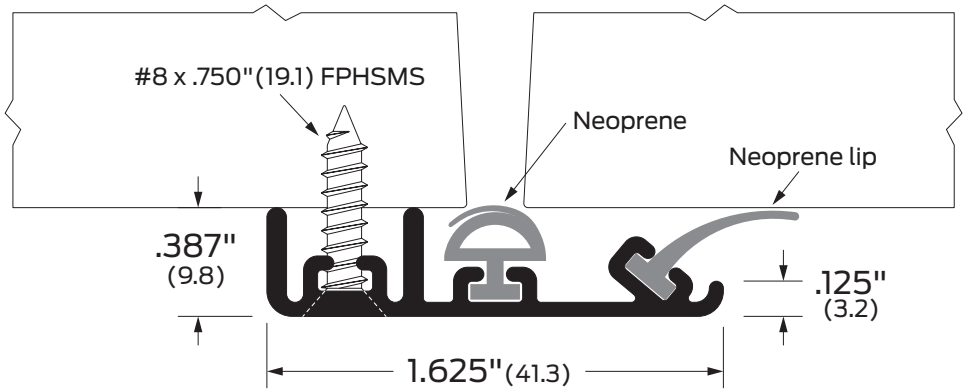

Notes:
90 minute max fire rating

Certifications:

- Fire rated-UL10c
- Sound

ANSI/BHMA:

383AA, 383BK, 383D, 383G R3B634

BHMA CERTIFIED

Finishes:

AA	Aluminum clear anodized
BK	Aluminum black anodized
D	Aluminum dark bronze anodized
G	Aluminum gold anodized

Options:

SEC	Security screws

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Part No:	Part description:
43	Meeting stile

Notes:	Provided by:	
Customer name:	Job no:	Date:

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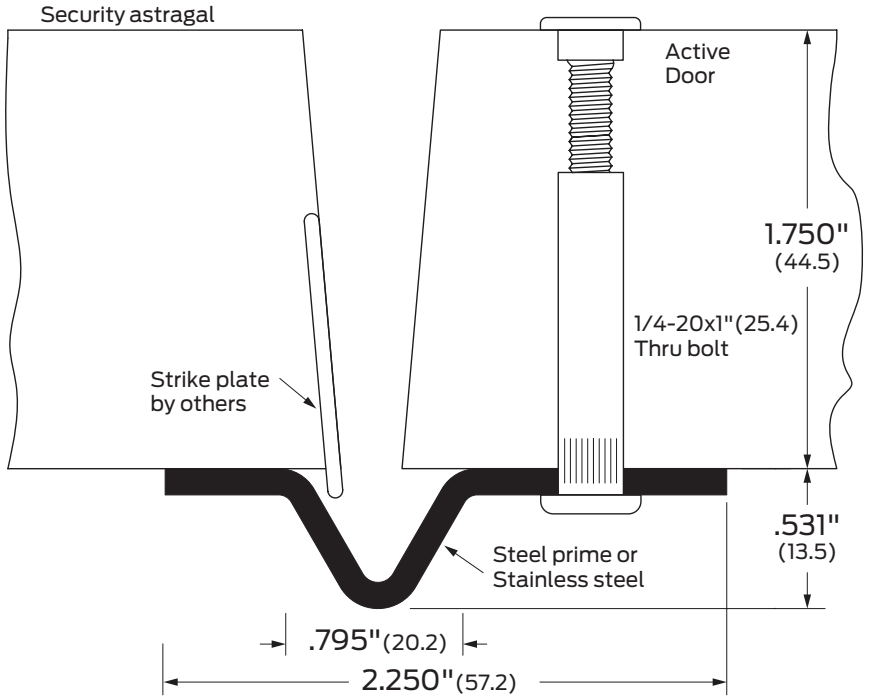

Certifications:

Fire rated-UL10c

Finishes:

SP Steel primed
STST Stainless steel

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Part No:	Part description:
55/155	Meeting stile

Notes:	Provided by:	
Customer name:	Job no:	Date:

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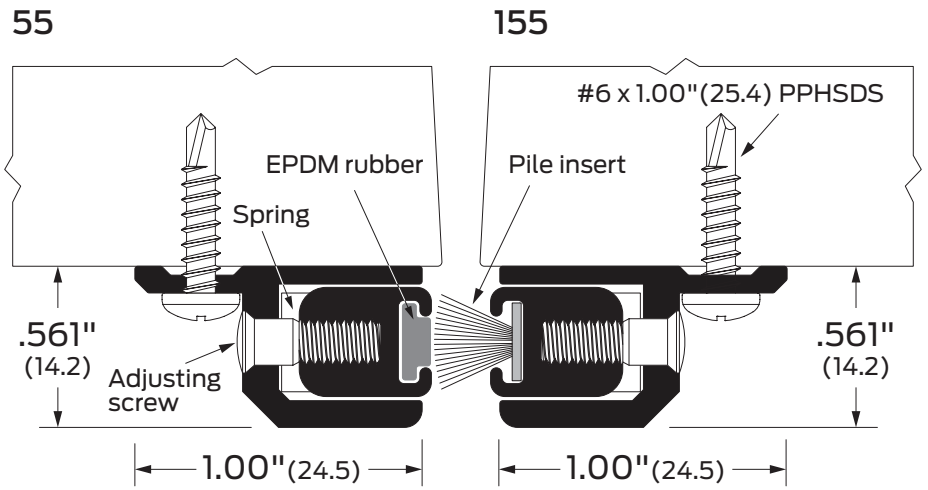

Notes:
Fire-rated as a set--both components required. Order components separately.

Certifications:

Fire rated-UL10c

ANSI/BHMA:

55AA/155AA, 55BK/155BK, 55D/155D, 55G/155G

R3F836

BHMA CERTIFIED

Finishes:

AA	Aluminum clear anodized
BK	Aluminum black anodized
D	Aluminum dark bronze anodized
G	Aluminum gold anodized

Options:

SEC	Security screws

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Part No:	Part description:
8192	Door sweep, meeting stile

Notes:	Provided by:	
Customer name:	Job no:	Date:

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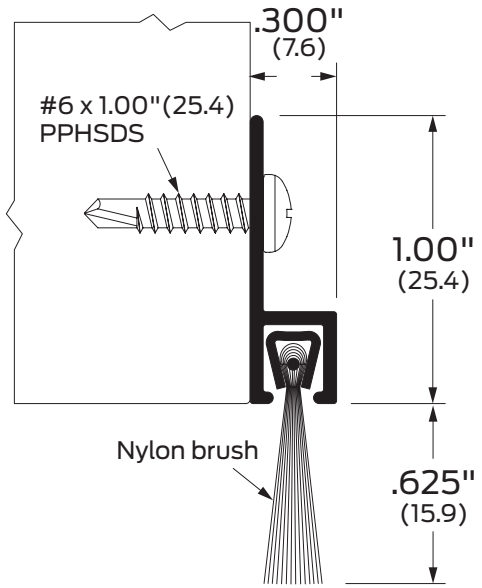

Certifications:

Fire rated-UL10c

ANSI/BHMA:

8192AA, 8192BK, 8192D, 8192G R3A436, R3A735

BHMA CERTIFIED

Finishes:

AA	Aluminum clear anodized
BK	Aluminum black anodized
D	Aluminum dark bronze anodized
G	Aluminum gold anodized

Options:

PSA	Pressure-sensitive adhesive
SEC	Security screws

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Part No:	Part description:
545	Saddle threshold

Notes:	Provided by:	
Customer name:	Job no:	Date:

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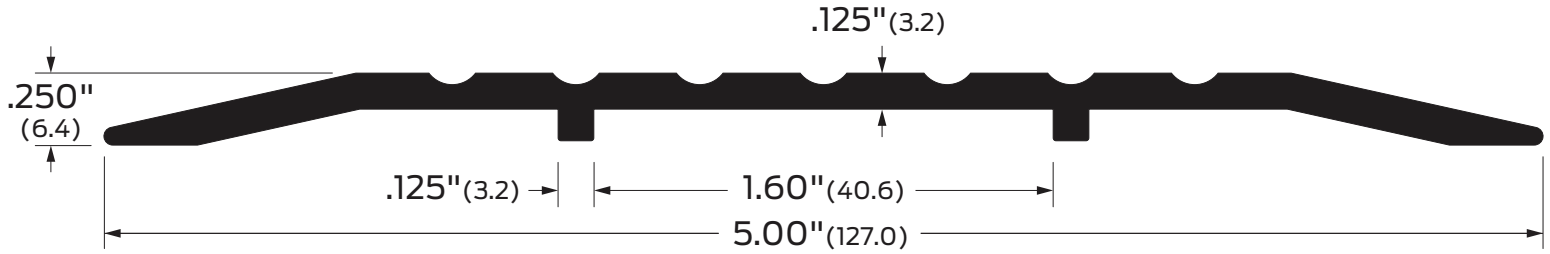

Certifications:

- Fire rated-UL10c
- ADA Accessible

ANSI/BHMA:

545A, 545BK, 545D, 545G	J32100, J32130
545A-E, 545BK-E, 545D-E, 545G-E	J32200, J32230

BHMA CERTIFIED

Finishes:

A	Aluminum mill finish
BK	Aluminum black anodized
D	Aluminum dark bronze anodized
G	Aluminum gold anodized

Options:

E	Epoxy abrasive tread
EL	Photoluminescent and abrasive epoxy tread
V3	Full body strength fill
EV3	Epoxy and full body strength fill
ELV3	Photoluminescent and abrasive epoxy tread, full body strength fill

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Part No:	Part description:
547	Saddle threshold

Notes:

Provided by:

Customer name:

Job no:

Date:

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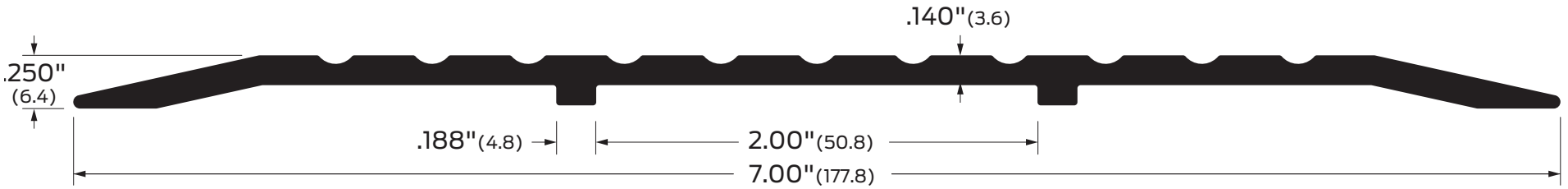

Notes:
Supplied without mounting holes.

Certifications:

- Fire rated-UL10c
- ADA Accessible

ANSI/BHMA:

547A, 547BK, 547D, 547G	J32100, J32130
547A-E, 547BK-E, 547D-E, 547G-E	J32200, J32230

BHMA CERTIFIED

Finishes:

A	Aluminum mill finish
BK	Aluminum black anodized
D	Aluminum dark bronze anodized
G	Aluminum gold anodized

Options:

E	Epoxy abrasive tread
EL	Photoluminescent and abrasive epoxy tread
V3	Full body strength fill
EV3	Epoxy and full body strength fill
ELV3	Photoluminescent and abrasive epoxy tread, full body strength fill

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SECTION 08 80 00
GLASS AND GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Windows.

2. Doors.

1.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 and the most recent addition of the California Building Code by a qualified professional engineer, using the following design criteria:

1. Design Wind Pressures: As indicated on Structural Drawings.

2. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.

3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.

1.3 PRECONSTRUCTION TESTING

A. Preconstruction Adhesion and Compatibility Testing: Test each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing will not be required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.4 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square.

C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

E. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA's "Glazing Manual".

2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use".

B. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or the manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1.6 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.

B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.

C. Thermal and Optical Performance Properties: Provide glass with performance properties specified and as indicated in manufacturer's published test data.

2.2 GLASS PRODUCTS

A. Tempered Glass.

B. See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. See Division 1 Section "Product Requirements."

C. Insulating Glass: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.

1. Products: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. AFG Industries, Inc.; Krystal Klear.
b. Guardian Industries Corp.; Ultrawhite.
c. Pilkington North America; Optiwhite.
d. PPG Industries, Inc.; Starphire.

C. Laminated Safety Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer or cast-in-place and cured-transparent-resin interlayer to comply with interlayer manufacturer's written recommendations.

2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.

3. Interlayer Color: Clear unless otherwise indicated.

2.3 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:

1. Neoprene complying with ASTM C 864.

2. EPDM complying with ASTM C 864.

3. Silicone complying with ASTM C 1115.

4. Thermoplastic polyolefin rubber complying with ASTM C 1115.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.

1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

2.4 GLAZING SEALANTS

A. General:

1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.

3. VOC Content: For sealants used inside of the weatherproofing system, not more than 250 g/L when calculated according to 40 CFR 59, Subpart D.

4. Colors of Exposed Glazing Sealants: As indicated by manufacturer's designations.

B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

C. Glazing Sealants for Fire-Rated Glazing Products: Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire-protection ratings indicated.

2.5 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:

1. AAMA 804.3 tape, where indicated.

2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.

3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.

2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.6 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

D. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

E. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

F. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.7 GLASS TYPES

A. Vision Glass Components:

1. Clear (interior Glazing):

a. Strength: Tempered.

b. Thickness: ¼-inch thick, unless otherwise indicated.

c. Locations: Provide at single glazed interior openings and as scheduled.

1) Provide at interior vision glass locations, and as scheduled.

d. Performance Values:

1) Visible Light Transmittance: 88 percent.

2) Shading Coefficient: 0.94

3) Winter U-Value: 1.09.

B. Coated Solar Control Types

1. Low-E2 (Exterior Glazing):

a. Type: PPG Solarban 60 (3). Provide insulated glass in accordance with dual-glazed assembly type specified above with low emissivity (low-E2) pyrolytic coating conforming to ASTM C 1376, tempered or heat strengthened where required by code. Locate coating on surface designated by number in parenthesis starting form exterior surface.

b. Thickness: ¼-inch thickness, or as required by code.

c. Locations: Provide at exterior vision glass locations, and as scheduled.

d. Performance Values:

1) Visible Light Transmittance: 52 percent.

2) Shading Coefficient: 0.35.

3) Winter U-Value: 0.29.

C. Special Purpose Types

1. Laminated:

a. Type: Tinted laminated glass with two plies of fully tempered float glass.

b. Thickness of Each Glass Ply: 1/4”

c. Interlayer Thickness: 1/4"

d. Provide safety glazing labeling.

e. Locations: Provide at all exterior glazing.

PART 3 - EXECUTION

3.1 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

3.2 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Apply heel bead of elastomeric sealant.

F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.4 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.5 CLEANING AND PROTECTION

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

END OF SECTION

SECTION 09 24 00
PORTLAND CEMENT PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior portland cement plasterwork (stucco) on metal lath.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show locations and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other work.

C. Samples: For each type of factory-prepared finish coat indicated.

1.3 QUALITY ASSURANCE

A. Fire-Resistance Ratings: Where indicated, provide portland cement plaster assemblies identical to those of assemblies tested for fire resistance per ASTM E 119 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

B. Mockups: Before plastering, install mockups of at least 100 sq. ft. (9.3 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.4 PROJECT CONDITIONS

A. Comply with ASTM C 926 requirements.

B. Factory-Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 - PRODUCTS

2.1 METAL LATH

A. Expanded-Metal Lath: ASTM C 847 with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.

1. Diamond-Mesh Lath: Self-furring, 2.5 lb/sq. yd. (1.4 kg/sq. m).

B. Paper Backing: FS UU-B-790, Type I, Grade D, Style 2 vapor-permeable paper.

1. Provide paper-backed lath at exterior locations.

2.2 ACCESSORIES

A. General: Comply with ASTM C 1063 and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories:

1. Foundation Weep Screed: Fabricated from hot-dip galvanized-steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.

2. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.

3. External-Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot-dip galvanized zinc coating.

4. Cornerbeads: Fabricated from zinc-coated (galvanized) steel.

a. Small-nose style; use unless otherwise indicated.

5. Casing Beads: Fabricated from zinc-coated (galvanized) steel; square-edged style; with expanded flanges.

6. Control Joints: Fabricated from zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.

7. Expansion Joints: Fabricated from zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.

8. Two-Piece Expansion Joints: Fabricated from zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch (6.34 to 16 mm) wide; with perforated flanges.

C. Plastic Accessories: Fabricated from high-impact PVC.

1. Cornerbeads: With perforated flanges.

a. Small-nose style; use unless otherwise indicated.

2. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.

a. Square-edge style; use unless otherwise indicated.

3. Control Joints: One-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.

4. Expansion Joints: Two-piece type, formed to produce slip-joint and square-edged 1/2- inch- (13-mm-) wide reveal; with perforated concealed flanges.

2.3 MISCELLANEOUS MATERIALS

A. Water for Mixing: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Fiber for Base Coat: Alkaline-resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in portland cement plaster.

C. Steel Drill Screws: For metal-to-metal fastening, ASTM C 1002 or ASTM C 954, as required by thickness of metal being fastened; with pan head that is suitable for application; in lengths required to achieve penetration through joined materials of no fewer than three exposed threads.

D. Fasteners for Attaching Metal Lath to Substrates: Complying with ASTM C 1063.

E. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch (1.21- mm) diameter, unless otherwise indicated.

2.4 PLASTER MATERIALS

A. Portland Cement: ASTM C 150, Type I.

B. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.

C. Sand Aggregate: ASTM C 897.

1. Color for Job-Mixed Finish Coats: as indicated on drawings.

D. Acrylic-Based Finish Coatings: Factory-mixed acrylic-emulsion coating systems, formulated with colorfast mineral pigments and fine aggregates; for use over portland cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic-based finishes.

1. Color: As selected by Architect from manufacturer's full range.

2.5 PLASTER MIXES

A. General: Comply with ASTM C 926 for applications indicated.

1. Fiber Content: Add fiber to base-coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.

B. Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork as follows:

1. Portland Cement Mixes:

   a. Scratch Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1- 1/2 parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

   b. Brown Coat: For cementitious material, mix 1 part portland cement and 3/4 to 1- 1/2 parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

2. Masonry Cement Mixes:

   a. Scratch Coat: 1-part masonry cement and 2-1/2 to 4 parts aggregate.

   b. Brown Coat: 1-part masonry cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.

3. Portland and Masonry Cement Mixes:

   a. Scratch Coat: For cementitious material, mix 1 part portland cement and 1-part masonry cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

   b. Brown Coat: For cementitious material, mix 1 part portland cement and 1-part masonry cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

4. Plastic Cement Mixes:

   a. Scratch Coat: 1-part plastic cement and 2-1/2 to 4 parts aggregate.

   b. Brown Coat: 1-part plastic cement and 3 to 5 parts aggregate, but not less than volume of aggregate used in scratch coat.

5. Portland and Plastic Cement Mixes:

   a. Scratch Coat: For cementitious material, mix 1-part plastic cement and 1 part portland cement. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

   b. Brown Coat: For cementitious material, mix 1 part plastic cement and 1 part portland cement. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

C. Factory-Prepared Finish-Coat Mixes: For acrylic-based finish coatings, comply with manufacturer's written instructions.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

B. Prepare solid substrates for plaster that are smooth or that do not have the suction capability required to bond with plaster according to ASTM C 926.

3.2 INSTALLATION, GENERAL

A. Fire-Resistance-Rated Assemblies: Install components according to requirements for design designations from listing organization and publication indicated on Drawings.

B. Sound Attenuation Blankets: Where required, install blankets before installing lath unless blankets are readily installed after lath has been installed on one side.

3.3 INSTALLING ACCESSORIES

A. Install according to ASTM C 1063 and at locations indicated on Drawings.

B. Reinforcement for External Corners:

1. Install lath-type, external-corner reinforcement at exterior locations.

2. Install cornerbead at exterior locations.

C. Control Joints: Install control joints at locations indicated on Drawings.

1. As required to delineate plasterwork into areas (panels) of the following maximum sizes:

a. Vertical Surfaces: 144 sq. ft. (13.4 sq. m).

b. Horizontal and other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).

2. At distances between control joints of not greater than 18 feet (5.5 m) o.c.

3. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.

4. Where control joints occur in surface of construction directly behind plaster.

5. Where plasterwork areas change dimensions, to delineate rectangular-shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.

3.4 PLASTER APPLICATION

A. General: Comply with ASTM C 926.

B. Walls; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork, 3/4-inch (19-mm) thickness.

1. Portland cement mixes.

2. Masonry cement mixes.

3. Portland and masonry cement mixes.

4. Plastic cement mixes.

5. Portland and plastic cement mixes.

C. Ceilings; Base-Coat Mixes for Use over Metal Lath: Scratch and brown coats for three-coat plasterwork; 1/2 inch (13 mm) thick.

1. Portland cement mixes.

2. Masonry cement mixes.

3. Portland and masonry cement mixes.

4. Plastic cement mixes.

5. Portland and plastic cement mixes.

D. Plaster Finish Coats: Apply to provide finish to match existing building.

E. Acrylic-Based Finish Coatings: Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.

3.5 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

END OF SECTION

SECTION 09 29 00
GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Interior gypsum board.

2. Tile backing panels.

B. Related Sections include the following:

1. Division 6 Section "Rough Carpentry" for wood framing and furring that supports gypsum board.

2. Division 9 painting Sections for primers applied to gypsum board surfaces.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples: For the following products:

1. Trim Accessories: Full-size Sample in 12-inch- (300-mm-) long length for each trim accessory indicated.

2. Textured Finishes: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

1.4 QUALITY ASSURANCE

A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

C. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for the following:

    a. Each level of gypsum board finish indicated for use in exposed locations.

    b. Each texture finish indicated.

2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups.

3. Simulate finished lighting conditions for review of mockups.

4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PANELS, GENERAL

A. Recycled Content: Provide gypsum panel products with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of percent by weight.

B. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

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

    a. American Gypsum Co.

    b. National Gypsum Company.

    c. USG Corporation.

B. Type X:

1. Thickness: 5/8”, or as indicated.

2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.

C. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board.

1. Thickness: 1/2 inch (12.7 mm).

2. Long Edges: Tapered.

D. Abuse-Resistant Type: Manufactured to produce greater resistance to surface indentation, through-penetration (impact resistance), and abrasion than standard, regular-type and Type X gypsum board.

1. Core: 5/8 inch (15.9 mm), Type X, USG VHI Abuse-Resistant or approved equal.

2. Long Edges: Tapered.

E. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.

1. Core: as indicated (15.9 mm), Type X.

2. Long Edges: Tapered.

2.3 TILE BACKING PANELS

A. Cementitious Backer Units: ANSI A118.9.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

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

    a. Custom Building Products; Wonderboard.

    b. FinPan, Inc.; Util-A-Crete Concrete Backer Board.

c. USG Corporation; DUROCK Cement Board.

3. Thickness: 1/2 inch (12.7 mm).

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

a. Cornerbead.

b. Bullnose bead.

c. LC-Bead: J-shaped; exposed long flange receives joint compound.

d. L-Bead: L-shaped; exposed long flange receives joint compound.

e. U-Bead: J-shaped; exposed short flange does not receive joint compound.

f. Expansion (control) joint.

g. Curved-Edge Cornerbead: With notched or flexible flanges.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

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

a. Fry Reglet Corp.

b. Approved equal.

3. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.

4. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Wallboard: Paper.

2. Tile Backing Panels: As recommended by panel manufacturer.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.

a. Use setting-type compound for installing paper-faced metal trim accessories.

3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.

4. Finish Coat: For third coat, use setting-type, sandable topping or drying-type, all-purpose compound.

5. Skim Coat: For final coat of Level 5 finish, use high-build interior coating product designed for application by airless sprayer and to be used instead of skim coat to produce Level 5 finish.

D. Joint Compound for Tile Backing Panels:

1. Cementitious Backer Units: As recommended by backer unit manufacturer.

2.6 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

1. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 1002 for fastening panels to wood members.

2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

D. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

2. Recycled Content: Provide blankets with recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content constitutes a minimum of 25 percent by weight.

E. Acoustical Sealant: As specified in Division 7 Section "Joint Sealants."

1. Provide sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Thermal Insulation: As specified in Division 7 Section "Building Insulation."

G. Vapor Retarder: As specified in Division 7 Section "Building Insulation."

2.7 TEXTURE FINISHES

A. Primer: As recommended by textured finish manufacturer.

B. Polystyrene Aggregate Ceiling Finish: Water-based, job-mixed, polystyrene aggregate finish with flame-spread and smoke-developed indexes of not more than 25 when tested according to ASTM E 84.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

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

a. G-P Gypsum; Georgia-Pacific Regency Ceiling Textures/Polystyrene.

b. National Gypsum Company; Perfect Spray.

c. USG Corporation; SHEETROCK Ceiling Spray Texture, QT.

3. Texture: Fine.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

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

3.2 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

E. Form control and expansion joints with space between edges of adjoining gypsum panels.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.

2. Fit gypsum panels around ducts, pipes, and conduits.

3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

H. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

I. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.

J. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

A. Install interior gypsum board in the following locations:

1. Type X: As indicated on Drawings and Where required for fire-resistance-rated assemblies.

2. Flexible Type: Apply in double layer at curved assemblies.

3. Ceiling Type: Ceiling surfaces.

4. Abuse-Resistant Type: As indicated on Drawings.
5. Moisture and mold resistant type: as indicated on drawings.

B. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.

2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

a. Stagger abutting end joints not less than one framing member in alternate courses of panels.

b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

C. Multilayer Application:

1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.

D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

E. Curved Surfaces:

1. Install panels horizontally (perpendicular to supports) and unbroken, to extent possible, across curved surface plus 12-inch- (300-mm-) long straight sections at ends of curves and tangent to them.

2. For double-layer construction, fasten base layer to studs with screws 16 inches (400 mm) o.c. Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches (300 mm) o.c.

3.4 APPLYING TILE BACKING PANELS

A. Water-Resistant Gypsum Backing Board. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.

B. Cementitious Backer Units: ANSI A108.11, at locations indicated to receive tile.

C. Areas Not Subject to Wetting: Install type-x gypsum wallboard panels to produce a flat surface.

D. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners.

2. Bullnose Bead: Use at outside corners.

3. LC-Bead: Use at exposed panel edges.

4. L-Bead: Use where indicated.

5. U-Bead: Use at exposed panel edges.

6. Curved-Edge Cornerbead: Use at curved openings.

C. Aluminum Trim: Install in locations indicated on Drawings.

3.6 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.

2. Level 2: Not used.

3. Level 3: Not Used.

4. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.

    a. Primer and its application to surfaces are specified in other Division 9 Sections.

5. Level 5: Where indicated on Drawings.

    a. Primer and its application to surfaces are specified in other Division 9 Sections.

E. Glass-Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

F. Glass-Mat, Water-Resistant Backing Panels: Finish according to manufacturer's written instructions.

G. Cementitious Backer Units: Finish according to manufacturer's written instructions.

3.7 APPLYING TEXTURE FINISHES

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish using powered spray equipment, to produce a uniform texture[matching approved mockup and] free of starved spots or other evidence of thin application or of application patterns.

C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray to prevent damage according to texture-finish manufacturer's written recommendations.

3.8 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 09 30 00
CERAMIC TILE

PART 1 – GENERAL

1.1 REFERENCE

A. Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.

1.2 DESCRIPTION

A. Principal Work Items Are:

1. Ceramic Tile:

a. Unglazed ceramic tile floors – full mortar bed.

b. Glazed walls – thin set.

2. Waterproof membrane at showers and other locations where indicated.

3. Patching, repairing and modifications to existing work wherever damaged or modified by construction operations.

B. Related Work Specified Elsewhere:

1. Demolition: Section 02 41 19.

2. Salvage of existing tiles for reuse at areas of patching and repair: Section 02 41 19.

3. Concrete: Section 03 30 00.

4. Gypsum Board: Section 09 29 00.

5. Plumbing fixtures/work: Division 22.

1.3 SUBSTITUTIONS

A. Only written approval of Architect will permit substitutions for materials specified; See General Conditions for procedure.

1.4 QUALITY ASSURANCE

A. Standards: In general, Work shall conform to latest edition of the following standards as applicable, and as modified herein:

1. Installation: Tile Council of American "Handbook for Ceramic Tile Installation".

2. Materials: Applicable ANSI standards, and Tile Council of America standards.

B. Requirements Of Regulatory Agencies; Codes: Conform to CCR Title 24, 2013 CBC and UBC.

C. Job Sample Panels For Ceramic Tile: When requested by Construction Manager.

1. Construct a 3' x 3' sample area of each pattern.

2. Obtain Architect's approval prior to proceeding with further tile work.

3. Approved sample may be incorporated into the finished work.

1.5 SUBMITTALS

A. Samples; 3 Copies:

1. For New Tile Areas: Mfr.'s full color range.

2. For Patching and Repairing of Existing Tile: Style and color to match existing tile.

3. Color for Mortar: Mfr.'s full color range, minimum 15 colors.

B. Certificates: Furnish Tile Council of America "Master Grade Certificate" for each type of tile, signed by manufacturer and Contractor. Deliver with tile to site.

C. Maintenance Materials; Spare Tile: In addition to tile required for installation, Contractor shall furnish the following to District's Inspector for delivery to District.

1. Floor Tile: 1 box of each color of new ceramic floor tile.

2. Wall Tile: 1 box of each color of new wall "field" tile and min. 1/2 box of each color of "accent" tile.

1.6 PRODUCT DELIVERY, STORAGE & HANDLING

A. Deliver tile to site in sealed containers with Grade Seals Intact. Store all materials in a dry location.

1.7 JOB CONDITIONS

A. Sequencing, Scheduling: Coordinate this work with demolition, concrete, framing, plumbing, lathing, plaster scratch coats, gypsum board, and/or backing furnished under other Spec. Sections and related work of other Spec. Sections.

B. Protection: DO NOT PERMIT hammering on stud walls or floors supporting tile until 7 days min. after tile installation.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Ceramic Tile:

1. General: Conform to ANSI A137.1-1980 "Standard Specification for Ceramic Tile". Tile to be Standard Grade. ALL Floor tile shall have a 0.6 min. coefficient of friction for interior location, per ASTM C-1028.

a. Tile patterns and price groups listed are according to Dal-tile "2001 Commercial Products" Catalog.

2. Acceptable Mfrs.:

a. Dal-Tile Corporation, Dallas, TX., 714-521-5224; as a standard of quality.

b. Equivalent products by American Olean Tile Co., Lansdale, PA.

c. Other Manufacturers: See Article 1.03, Substitutions.

3. Ceramic Mosaic Tile For Floors: Unglazed, dust pressed, square-edged 1/4” thick porcelain tile. Min. coefficient of friction of 0.6 for interior and 0.8 for exterior per ASTM C1028.

a. Types:

(1) Dal-Tile Keystone Unglazed Ceramic Mosaics.

(2) American Olean Unglazed Porcelain Ceramic Mosaics.

b. Size For Floor Tile: 2" x 2".

c. Colors: Two colors as selected by Architect in any combination from mfr.'s standard range of colors within the following color/price groups (30 colors min. range):

(1) Dal-Tile Keystone Price Groups 1, 2, and 3.

(2) American Olean Color/Price Groups 1, 2, and 3.

4. Glazed Tile For Walls, Base, & Wainscots: Glazed, dust pressed, machine made, white body, cushion edge, solid-color glaze, matte and high gloss.

a. Types:

(1) Dal-Tile Glazed Wall Tile; "Matte", "Semi-Gloss" and “Kohler Coordinates”; Price Groups 1, 2, and 3.

(2) American Olean Glazed Wall Tile; "Bright" and "Matte"; Price Groups 1, 2, and 3.

b. Size: 4-1/4" x 4-1/4" square, unless noted otherwise.

c. Colors: As selected by Architect in any combination or quantity from Mfr.'s. standard range of colors within Price Groups listed above (36 colors min. range).

d. Trimmer Shapes:

(1) Provide all trimmer shapes as required for complete work; some trim is listed herein.

(2) Outside Corners And At Tops And Edges Of Wainscots:

(a) At full mortar bed: Radius integral bull-nose tile, 4-1/4” x 4-1/4”, typical. (Dal-Tile A-4402, ACR-4402, ACR-4402).

(b) At thin-set applications: Integral bull-nose tile 4-1/4” x 4-1/4”, typical (Dal-Tile S-4449, SCR-4449, SCL-4449).

(3) Inside Corners:

(a) At wall tile on full mortar bed: 4-1/4” x 4-1/4” typical wall tile square butt to adjacent tile, typical.

(b) At thin-set applications: Integral bull-nose tile 4-1/4” x 4-1/4”, typical (Dal-Tile A-3401, SBL-4449, SBR-4449).

(4) Base at tile floors:

(a) At tile floors and walls/wainscots, full mortar bed: 4-1/4” x 4-1/4”, coved base, square top (Dal-Tile A-3401).

(i) At outside corners, full mortar bed: 4-1/4”, coved base, square top, integral radius corner (Dal-Tile ACR-3401 or ACL-3401).

(ii) At inside corners, full mortar bed: Square butt coved base (A-3401) to adjacent tile, cut to fit.

(b) At tile floors and walls/wainscots, thin-set application: 4-1/4” x 4-1/4”, coved base, square top (Dal-Tile A-3401).

(i) At outside corners, thin-set: 4-1/4”, coved base, square top, integral radius corner (Dal-Tile SCR-3401 or SCL-3401).

(ii) At inside corners, full mortar bed: Square butt coved base (A-3401) to adjacent tile, cut to fit.

(c) At tile floors and no wall tile, thin set: 4-1/4” x 4-1/4” coved base, round top (Dal-tile S-3419T).

(i) At outside corners, thin set: Dal-Tile SCR-3419T, SCL-3419T.

(ii) At inside corners, thin set: Square butt coved base (S-3419T) to adjacent tile, cut to fit.

B. Patching, Repairing & Modifications To Existing:

1. MATCH EXISTING: Field verify type, size, color, etc.

2. Coordinate work with demolition and salvage, Spec. Section 02 41 19, Demolition.

3. Acceptable Materials:

a. New tile, only if exactly matching existing tile and approved by Architect a minimum of 2 weeks prior to installation.

C. Installation Materials:

1. Portland Cement:

a. For Ceramic Tile: ASTM C150, Type 1, portland cement for grouting and pointing mortar; Trinity, Atlas, or Medusa; white color. Typical:

(1) At existing tile flooring and base, match existing grout.

2. Sand: Washed, graded natural sand or screening, durable, free from deleterious substance; conforming to ASTM C144.

3. Water: Domestic source, clean and potable.

4. Hydrated Lime: High calcium type: ASTM C206 or C207, Type S.

5. Color For Grout: Pure synthetic iron oxide, limeproof, nonfading mineral pigments:

a. Colors as selected by Architect from full color range including white and black.

b. Match existing color at patching, repair and modifications of existing work.

6. Dry-Set Portland Cement Mortar: Conform to ANSI A118.1-1999; Custom Building Products Custom Thin Set Mortar, Mapei Kerabond, or acceptable equal.

7. Latex-Portland Cement Mortar: Conform to ANSI A118.4-1999.

a. For Porcelain Floor Tile: Laticrete #3030 Mega-Bond.

b. For White-Body Wall Tile: Laticrete #4237 with #211 Crete Filler Powder.

8. Sealer; For Sealing Grout Joints: Ameritone $7101 Clear Concrete Sealer.

9. Waterproofing Membrane (where required):

   a. Acceptable Mfrs./Products:

      (1) W.R. Grace & Co., (800) 444-6459, ext. 5364, Laguna Niguel, CA, as a standard of quality.

      (2) Other Mfrs.: Comply with Art. 1.03.

   b. Sheet Membrane Waterproofing:

      (1) Type: Bituthene #3000, by W.R. Grace.

      (2) Properties: 60 mil thick factory-made, self-adhesive, cold-applied composite sheet consisting of: 56 mils thickness of rubberized asphalt; 4 mils of cross-laminated, high-density, polyethylene film specially formulated for use with water-based surface conditioner. Membrane shall be covered with release paper, which is removed during installation. (No special adhesive or heat shall be required to form laps).

         (a) Tensile Strength: 250 psi for membrane; 5000 psi for polyethylene film.

         (b) Elongation Of Rubberized Asphalt: 300% to failure.

         (c) Peel Adhesion: 9.0 lbs/inch of width.

         (d) Permeance: 0.05 grains/sq. ft./hr./in. Hg.

         (e) Water Absorption: 0.1% max.

   c. Primer: Bituthene Low VOC Content Primer; a rubber-based primer in solvent conforming to APCD requirements.

   d. Mastic: Bituthene rubberized asphalt-based mastic.

   e. Liquid Membrane: Bituthene 2-component elastomeric, cold-applied, trowel-grade material.

   f. Miscellaneous Materials: Tape and other accessories as recommended by sheet membrane mfr.

PART 3 – EXECUTION

3.1 INSPECTION

A. Examine surfaces scheduled to receive tile work, lath and plaster scratch coats and all other substrates. Report any unsatisfactory conditions. Ensure that substrates are firm, clean and free of oily film or other unsuitable conditions. Verify substrates do not exceed the following max. variation from required plane.

1. Floors: 1/4” in 10’-0” from every direction.

2. Walls: 1/4” in 10’-0” from every direction.

B. Do not start work until unsatisfactory conditions are corrected. Starting work constitutes acceptance of surfaces.

3.2 INSTALLATION, GENERAL

A. All work by skilled mechanics and in accordance with the applicable provisions of the Handbook for Ceramic Tile Installation, By Tile Council of America.

B. Bring each tile to true level and plane by uniformly applied pressure. Lay tile to straight edges, accurately set to lines established to keep joints parallel over entire area. Space joint widths evenly to accommodate the tile in the given space with a minimum of cutting and to maintain maximum joint width of 1/8”, unless noted or Architect-approved otherwise.

C. After setting tiles, sound tile; remove and replace hollow sounding units.

D. Allow tile to set a minimum of 48 hours prior to grouting.

3.3 INSTALLATION; TILE WORK WITH FULL PORTLAND CEMENT MORTAR BED

A. Scope: Install tile work with full portland cement mortar bed at the following locations:

1. At all new tile work on concrete sub-floors.

B. Application:

1. Mortar Bed: Full portland cement. At concrete subfloor, direct to concrete. At walls (masonry, concrete and wood-framed), apply over plaster scratch coat and metal lath by other Spec. Sections.

2. Bond Coat: One of the following.

a. Conventional portland cement mortar per ANSI A108.1-1976.

b. Dry-set or latex portland cement mortar per ANSI A108.5-1976.

3. Grout:

a. Colored, typically as selected by Architect. For work at existing tile, colored to match existing grout.

b. Mix: approved factory-prepared mix.

4. Pattern: Stack bond, typical for new. Match existing pattern at patching and repairs to existing.

3.4 INSTALLATION; TILE WORK THIN-SET OVER CEMENTITIUOS BACKER UNIT

A. Scope: Install tile work thin-set over cementitious backer unit, ANSI A118.9 at the following locations:

1. At all new tile work on walls.

B. Installation: Lay tile in thin set mortar in accordance with ANSI A118.4 & TCA Method W244.

1. Bond Coat: Dry-set or latex portland cement mortars per ANSI A118.4.

2. Grout: Colored as selected by Architect. Mix: approved factory-prepared mix.

3.5 PATCHING & MODIFICATIONS TO EXISTING WORK

A. General:

1. See Article 1.7 C herein regarding hazardous materials.

2. Conform to same standards as specified for all-new work.

3. Patches to be in-plane with adjoining existing work.

4. Small holes; 3/8" max. size: Patch with grout, tint to match tile color.

5. Preparation: Clean existing holes and tile backing surfaces to provide a proper bond to new work. Brush and clean surfaces free of dirt, paint, damaged mortar or grout, and all loose material. Repair and patch backing surfaces.

6. Large Holes: Replace with full tile to match existing, and regrout to match existing. Re-use matching existing tile from demolished areas. Do not use any materials/tiles containing lead.

7. Missing, Damaged, Or Chipped Tiles: Cut out and replace with matching tile; regrout.

8. Pointing: Cut out defective joints and repoint.

9. At patching and repair, match existing tile pattern and construction; if existing tile is thin-set, then thin-set the new tile with bond coat; if existing tile is full mortar bed, then use full portland cement mortar bed as required for new tile to match existing. Replace or repair metal lath and plaster scratch coat, or other backing materials, as required for proper installation of wall tile to match existing conditions.

10. Coordinate work with Demolition, Section 02 41 19.

3.6 ADJUSTMENT & CLEANING; TILE WORK

A. Protection:

1. Protect finish hardware and adjacent material surfaces with Vaseline in cases where acid solutions are used.

2. Protect exposed work against staining, droppings, or defacement.

3. Do not permit any hammering on stud walls or floors supporting tile for 7 days min. after tile installation.

B. Cleaning:

1. Clear surface as work progresses.

2. Remove mortar droppings and stains as soon as possible.

3. Upon completion of any portion of tile work, remove all rubbish and unused materials incidental to the installation, and give the finished surfaces a thorough cleaning in an approved manner. Remove all traces of cement and dust accumulations.

4. DO NOT use acid solutions on glazed tile work.

5. Mix acid solution where required to clean unglazed tile and all terrazzo surfaces, in proportions of 10% muriatic (HCL) acid to 90% water. Rinse with clear water to eliminate the acid salts precipitating from interaction with the cement particles. Do not allow the acid solution to dry on the face of the tile and terrazzo.

C. Correction Of Defective Work:

1. General: Work not conforming to Contract requirements shall be removed and replaced; except where patching or other remedial work is specifically permitted by Construction Manager. Contractor shall bear all costs of correction of defective work.

2. Pointing: Cut out defective joints and repoint.

3. Cut out and replace chipped and damaged tile.

4. Replace all tiles that sound hollow when tapped.

3.7 SEALING TILE WORK

A. General: Materials and application shall conform to Health Department requirements to provide an approvable sanitary condition.

B. Scope: Seal all grout joints at all new tile work. Do not apply sealer to tiles.

C. Material: Ameritone #7101 Clear Concrete Sealer.

D. Application: Apply 2 coats at a rate of 500 sq. ft. max./gal/coat.

END OF SECTION

SECTION 09 65 19
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Flooring and accessories as shown on the drawings and schedules and as indicated by the requirements of this section.

B. Related Documents

1. Drawings and General Provisions of the Contract (including General and Supplementary Conditions and Division 1 sections) apply to the work of this section.

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers and titles per CSI MasterFormat™ and specifier's practice.

C. Related Sections:

1. Other Division 9 sections for floor finishes related to this section but not the work of this section

2. Division 3 Concrete; not the work of this section

3. Division 6 Wood and Plastics; not the work of this section

4. Division 7 Thermal and Moisture Protection; not the work of this section

1.02 REFERENCES

A. ASTM International:

1. ASTM E 648 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

2. ASTM E 662 Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials

3. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

4. ASTM F 1066 Standard Specification for Vinyl Composition Tile

5. ASTM F 1482, Standard Guide to Wood Underlayment Products Available for Use Under Resilient Flooring

6. ASTM F 1861 Standard Specification for Resilient Wall Base

7. ASTM F 1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

8. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

B. National Fire Protection Association (NFPA):

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

2. NFPA 258 Standard Test Method for Measuring the Smoke Generated by Solid Materials

C. Canadian Standards

1. CAN/ULC-S102.2 Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide flooring which has been manufactured, fabricated, and installed to performance criteria certified by manufacturer without defects, damage, or failure.

B. Administrative Requirements

1. Pre-installation Meeting: Conduct an on-site pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.

2. Pre-installation Testing: Conduct pre-installation testing as follows: [Specify testing (i.e., moisture tests, bond test, pH test, etc)

Specifier Note: Retain paragraph below for erected assemblies (either on-site or off-site) required for review of construction, coordination of work of several sections, testing, or observation of operation. Mock-ups, when accepted or approved, establish standards by which work will be judged. Coordinate below with Division 1 Quality Control (Mock-Up Requirements) Section.

C. Test Installations/Mock-ups: Install at the project site a job mock-up using acceptable products and manufacturer approved installation methods, including concrete substrate testing. Obtain Owner's and Consultant's acceptance of finish color, texture and pattern, and workmanship standards.

Specifier Note: Contact an Armstrong Flooring Sales Representative for more information about test installations.

1. Mock-Up Size: [Specify mock-up size.]

2. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.

3. Incorporation: Mock-up may be incorporated into the final construction with Owner's approval.

D. Sequencing and Scheduling

1. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring.

2. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond, moisture tests and pH test.

Specifier Note: Some products may be installed using an Armstrong high moisture adhesive.

1.04 SUBMITTALS

A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions for flooring and accessories.

B. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.

Specifier Note: Order product samples and access technical documents, including installation instructions, product specification sheets, SDS and more at www.armstrongflooring.com/commercial.

C. Submit Safety Data Sheets (SDS) available for adhesives, moisture mitigation systems, primers, patching/leveling compounds, floor finishes (polishes) and cleaning agents and Material Information Sheets for flooring products.

D. If required, submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

E. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data: Operation and maintenance data for installed products in accordance with Division 1 Closeout Submittals (Maintenance Data and Operation Data) Section. Include methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.

2. Warranty: Warranty documents specified herein

1.05 QUALITY ASSURANCE

A. Single-Source Responsibility: provide types of flooring and accessories supplied by one manufacturer, including moisture mitigation systems, primers, leveling and patching compounds, and adhesives.

B. Select an installer who is experienced and competent in the installation of Armstrong resilient vinyl composition tile flooring and the use of Armstrong Flooring subfloor preparation products.

1. Engage installers certified as Armstrong Commercial Flooring Certified Installers

2. Confirm installer's certification by requesting their credentials

C. Fire Performance Characteristics: Provide resilient vinyl composition tile flooring with the following fire performance characteristics as determined by testing material in accordance with ASTM test methods indicated below by a certified testing laboratory or other testing agency acceptable to authorities having jurisdiction:

1. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I

2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less

3. CAN/ULC-S102.2 – Flame Spread Rating and Smoke Developed – Results as tested.

Specifier Note: Download the latest Fire and Smoke reports at www.armstrongflooring.com/commercial.

1.06 DELIVERY, STORAGE AND HANDLING

A. Comply with Division 1 Product Requirements Sections

B. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

C. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.

D. Store materials in a clean, dry, enclosed space off the ground, protected from harmful weather conditions and at temperature and humidity conditions recommended by the manufacturer. Protect adhesives from freezing. Store flooring, adhesives, and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

1.07 PROJECT CONDITIONS

A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65º F (18º C) and a maximum temperature of [100º F (38º C)] for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55º F (13º C) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances. Refer to product installation recommendations for a complete guide on project conditions.

1.08 LIMITED WARRANTY

A. Resilient Flooring: Submit a written warranty executed by the manufacturer, agreeing to repair or replace resilient flooring that fails within the warranty period.

B. Limited Warranty Period: 5 years

C. Limited Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

D. For the Limited Warranty to be valid, this product is required to be installed using the appropriate Armstrong Flooring Guaranteed Installation System. Product installed not using the specific instructions from the Guaranteed Installation System will void the warranty.

Specifier Note: To deliver your client the best customer experience, register the product and installation with the Product Registration service provided at www.armstrongflooring.com/commercial.

1.09 EXTENDED SYSTEM LIMITED WARRANTY

A. Resilient Flooring System: Submit a written warranty executed by the manufacturer, agreeing to repair or replace system (subfloor preparation products, adhesive, and floor covering) that fails within the warranty period.

B. Limited Warranty Period: 10 years on top of the Resilient Flooring Limited Warranty.

C. [S-463 Level Strong™ cement based self-leveling compound] [S-466 Patch Strong™ flexible patching and smoothing compound] [S-464 Prime Strong™ acrylic primer for porous substrates] [S-465 NP Prime Strong™ epoxy primer for non-porous substrates] [S-462 Seal Strong™ two-part moisture mitigation system].

D. The installation of an Armstrong Flooring product along with the recommended Armstrong Flooring adhesive, as well as any one of the Strong System subfloor preparation products listed above, provides 10 additional years of limited warranty coverage. The Strong System limited warranty covers the installation integrity for the length of the flooring product warranty plus 10 years. To qualify for the Strong System Warranty, any subfloor preparation product needed for an installation must be an Armstrong Flooring product.

E. For the System Limited Warranty to be valid, this product is required to be installed using the appropriate Armstrong Flooring Guaranteed Installation System. Product installed not using the specific instructions from the Guaranteed Installation System will void the warranty.

F. When Armstrong Flooring Strong System subfloor preparation products are used with other manufacturers' floor coverings, adhesives, or other subfloor preparation products, Armstrong Flooring warrants our products to be free from manufacturing defects from the date of purchase through the limited warranty period of 15 years.

1.10 MAINTENANCE

A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials from same production run as products installed. Packaged with protective covering for storage and identified with appropriate labels.

Specifier Note: Revise paragraph below specifying size and percentage as required for project.

1. Quantity: Furnish quantity of flooring units equal to [ ] % of amount installed.

2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage, and protection of extra material.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Resilient tile flooring, wall base, adhesives and subfloor preparation products and accessories:

Armstrong Flooring Inc., 1770 Hempstead Road, Lancaster, PA 17605, www.armstrongflooring.com/commercial

1. Manufacturer must have a headquarters in the United States of America.

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal, and regulatory) and assignment of responsibility for determining "or equal" products.

2.02 RESILIENT TILE FLOORING MATERIALS

Specifier Note: For a product specification snapshot which includes product structures, packaging information and color choices, visit www.armstrongflooring.com/commercial.

A. Provide Vinyl Composition Tile: Standard Excelon® Imperial® Texture and Premium Excelon Crown Texture Tile Flooring and manufactured by Armstrong Flooring, Inc.

1. Description: Tile composed of polyvinyl chloride resin, plasticizers, fillers, stabilizers and pigments with colors and texture dispersed uniformly throughout its entire thickness.

2. Vinyl composition tile shall conform to the requirements of ASTM F 1066, “Standard Specification Vinyl Composition Floor Tile", Class 2, through-pattern

3. Pattern and Color: in [%COLOR%] [color selected from the range currently available from Armstrong Flooring, Inc.]

4. Size: 12 in. x 12 in. (305 mm x 305 mm)

5. Thickness: [1/8 in./0.125 in. (3.2 mm)] [3/32 in./0.095 in. (2.4 mm)]

2.03 PRODUCT SUBSTITUTION

A. Substitutions: No substitutions permitted because of the specific attributes listed in Section 2.02.

Specifier Note: Add article below for alternates required for the project, state work covered. Coordinate with other sections, as needed.

2.04 WALL BASE MATERIALS

A. For top set wall base: [Provide 1/8 in. (3.18 mm) thick, 4 in. (10.16 cm) high Armstrong Flooring Wall Base with a matte finish, conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 1 - Solid, Style B – Cove.] [Provide 1/4 in. (6.35 mm) thick, 4.5 in. (11.43 cm) high Armstrong Flooring Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 1 - Solid, Style A – Straight.]

2.05 ADHESIVES

A. For Tile Installation System, Full Spread: Provide Armstrong [S-515 Floor Tile Adhesive] [S-525 BBT® Bio-Flooring Adhesive] under the tile and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer.

B. [For Tile Installation System, Tile On: Provide Armstrong [S-515 Floor Tile Adhesive] [S-525 BBT® Bio-Flooring Adhesive] under the tile over smooth, completely bonded existing resilient flooring and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer].

C. [For Tile High-Moisture Installation Warranty, Full Spread: Provide Armstrong [S-515 Floor Tile Adhesive] [S-525 BBT® Bio-Flooring Adhesive] under the tile and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer].

D. [Provide Armstrong S-1000 Flooring Adhesive under the flooring and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer].

2.06 ACCESSORIES

A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide Armstrong [S-194 Cement-Based Patch, Underlayment and Embossing Leveler / S-195 Underlayment Additive] [S-463 Level Strong™ cement based self-leveling compound] [S-466 Patch Strong™ patching and smoothing compound].

B. [For priming porous substrates to aid in adhesive bond strength and reducing subfloor porosity, provide S-464 Prime Strong™ acrylic primer for porous substrates. For non-porous substrates, provide S-465 NP Prime Strong™ epoxy primer for non-porous substrates].

C. [For creating a moisture barrier, provide S-462 Seal Strong™ two-part moisture mitigation system].

D. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.

E. Provide transition/reducing strips tapered to meet abutting materials.

F. Provide threshold of thickness and width as shown on the drawings.

G. Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl, or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Architect from standard colors available.

H. Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

PART 3 – EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including technical bulletins, product catalog, installation instructions, and product carton instructions for installation and maintenance procedures as needed.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions (i.e., moisture tests, bond test, pH test, etc.).

B. Visually inspect flooring materials, adhesives, and accessories prior to installation. Flooring material with visual defects shall not be installed and shall not be considered as a legitimate claim.

C. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

D. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.

E. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

F. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates regarding conditions existing at the time of installation.

3.03 PREPARATION

A. [Subfloor Preparation: Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with Armstrong Flooring [S-194 Cement-Based Patch, Underlayment and Embossing Leveler / S-195 Underlayment Additive] [S-463 Level Strong™ cement based self-leveling compound] [S-466 Patch Strong™ patching and smoothing compound] [S-464 Prime Strong™ acrylic primer for porous substrates] [S-465 Prime Strong™ epoxy primer for non-porous substrates] as recommended by the flooring manufacturer. Refer to Armstrong Flooring Guaranteed Installation Systems and ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.]

B. [Subfloor Preparation Moisture Mitigation: Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, mitigate moisture and other defects with Armstrong Flooring [S-194 Cement-Based Patch, Underlayment and Embossing Leveler / S-195 Underlayment Additive] [S-463 Level Strong™ cement based self-leveling compound] [S-466 Patch Strong™ patching and smoothing compound] [S-462 Seal Strong™ two-part moisture mitigation system] [S-464 Prime Strong™ acrylic primer for porous substrates] [S-465 Prime Strong™ epoxy primer for non-porous substrates] as recommended by the flooring manufacturer. Refer to Armstrong Flooring Guaranteed Installation Systems and ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.]

C. Subfloor Cleaning: The surface shall be free of dust, solvents, varnish, paint, wax, oil, grease, sealers, release agents, curing compounds, residual adhesive, adhesive removers, and other foreign materials that might affect the adhesion of resilient flooring to the concrete or cause a discoloration of the flooring from below. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents. Spray paints, permanent markers and other indelible ink markers must not be used to write on the back of the flooring material or used to mark the concrete slab as they could bleed through, telegraphing up to the surface and permanently staining the flooring material. If these contaminants are present on the substrate, they must be mechanically removed prior to the installation of the flooring material. Refer to the Armstrong Flooring Guaranteed Installation Systems and ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring for additional information on subfloor preparation.

D. [For Tile High-Moisture Installation Warranty when using S-515 Adhesive, perform subfloor moisture testing in accordance with [ASTM F 2170, “Standard Test Method for Determining Relative Humidity in Concrete Slabs Using *in situ* Probes”][ASTM F 1869,“Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”] and Bond Tests as described in the Armstrong Flooring Guaranteed Installation Systems, to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Relative humidity shall not exceed 95%.] [MVER shall not exceed 7 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained].

E. [For Tile High-Moisture Installation Warranty when using S-525 Adhesive, perform subfloor moisture testing in accordance with [ASTM F 2170, “Standard Test Method for Determining Relative Humidity in Concrete Slabs Using *in situ* Probes”][ASTM F 1869,“Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”] and Bond Tests as described in the Armstrong Flooring Guaranteed Installation Systems, to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Relative humidity shall not exceed 90%.] [MVER shall not exceed 7 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

F. [When using S-1000 Adhesive, perform subfloor moisture testing in accordance with [ASTM F 2170, “Standard Test Method for Determining Relative Humidity in Concrete Slabs Using *in-situ* Probes”] [ASTM F 1869,“Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride”] and Bond Tests as described in "Armstrong Flooring Guaranteed Installation System" instructions to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Internal relative humidity of the concrete shall not exceed 100%.] [MVER shall not exceed 14 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained].

G. Concrete pH Testing: Perform pH tests on concrete floors regardless of their age or grade level. All test results shall be documented and retained.

H. Wood subfloors: Armstrong resilient floors are recommended on suspended wood subfloors with a 1/4 in. underlayment (see product installation systems for exceptions) and a minimum of 18 in. of well-ventilated air space below. Armstrong Flooring does not recommend installing resilient flooring on wood subfloors applied directly over concrete or on sleeper-construction subfloors. Loading requirements for subfloors are normally set by various building codes on both local and national levels. Trade associations such as APA–The Engineered Wood Association provide structural guidelines for meeting various code requirements. Subfloor panels are commonly marked with span ratings showing the maximum center-to-center spacing in inches of supports over which the panels should be placed.

    1. Refer to the Armstrong Flooring Guaranteed Installation Systems and ASTM F 1482, Standard Guide to Wood Underlayment Products Available for Use Under Resilient Flooring for additional information.

I. Wood subfloors - Surface Cleaning: Make subfloor free from dust, dirt, grease, and all foreign materials.

1. Check panels for sources of discoloration such as contamination from paint, varnish, stain overspray or spills, plumbing sealers, asphalt, heater fuel, markers, or potential staining agents such as wood or bark not visible on the surface, edge sealers, logo markings, printed nail patterns and synthetic patches.

2. Remove old adhesive.

3. Cover adhesive, oil, or wax residue with an appropriate underlayment. If the residue is tacky, place a layer of felt or polyethylene sheeting over it to prevent a cracking sound when walking on the floor.

4. Remove all paint, varnish, oil, and wax from all subfloors. Many buildings constructed before 1978 contain lead-based paint, which can pose a health hazard if not handled properly. State and federal regulations govern activities that disturb lead-based painted surfaces and may also require notice to building occupants. Do not remove or sand lead-based paint without consulting a qualified lead professional for guidance on lead-based paint testing and safety precautions. Armstrong Flooring does not recommend the use of solvents to remove paint, varnish, oil, wax, or old adhesive residues because the solvents can remain in the subfloor and negatively affect the new installation. Whenever sanding, be certain the work site is well ventilated and avoid breathing dust. If high dust levels are anticipated, use appropriate National Institute for Occupational Safety and Health (NIOSH) designated dust respirator. All power sanding tools must be equipped with dust collectors. Avoid contact with skin or eyes. Wear gloves, eye protection and long-sleeve, loose fitting clothes.

5. For additional information on the installation and preparation of wood and board-type underlayments see the current edition of ASTM F1482, “Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring.”

6. Vacuum or broom-clean surfaces to be covered immediately before the application of flooring.

3.04 INSTALLATION OF FLOORING

A. Install flooring in strict accordance with the latest edition of Armstrong Flooring Guaranteed Installation Systems. Failure to comply may result in voiding the manufacturer’s warranty listed in Section 1.08.

B. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.

C. If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.

D. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.

E. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.05 INSTALLATION OF ACCESSORIES

A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths if practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.

C. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

D. Apply [butt-type] [overlap] metal edge strips where shown on the drawings, [before] [after] flooring installation. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.06 CLEANING

Specifier Note: Information can be obtained by visiting www.armstrongflooring.com/commercial.

A. Perform initial and on-going maintenance according to the latest edition of the Maintenance Instructions for Vinyl Composition & Bio-Based Tile.

3.07 PROTECTION

A. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.

END OF SECTION

SECTION 09 65 66
RESILIENT ATHLETIC FLOORING

1.1 SUMMARY

1.1.1 Products Supplied

A. Resilient athletic flooring.

B. Accessories required for installation, maintenance and repair.

1.1.2 Related Requirements

Specifier Note: The following CSI sections serve as a guide to what is essential information needed to determine the acceptability of the site conditions required for the installation of resilient athletic flooring. The Specifier may choose to include other sections he/she deems necessary.

A. Section 02 25 00 – Existing Material Assessment

B. Section 03 05 00 – Common Work Results for Concrete

C. Section 06 05 00 – Common Work Results for Wood, Plastics, and Composites

D. Section 07 05 00 – Common Work Results for Thermal and Moisture Protection

E. Section 07 10 00 – Dampproofing and Waterproofing

1.2 REFERENCES

1.2.1 ASTM International (ASTM)

A. ASTM D412: Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.

B. ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as measured by the James Machine.

C. ASTM D2240: Standard Test Method for Rubber Property (Durometer Hardness).

D. ASTM D3389: Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader).

E. ASTM E492: Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine.

F. ASTM E648: Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

G. ASTM E1643: Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

H. ASTM E1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

I. ASTM E2180: Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) In Polymeric or Hydrophobic Materials.

J. ASTM F386: Standard Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces.

K. ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

L. ASTM F925: Standard Test Method for Resistance to Chemicals of Resilient Flooring.

M. ASTM F970: Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading.

N. ASTM F1514: Standard Test method for Measuring Heat Stability of Resilient Flooring by Color Change.

O. ASTM F1515: Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change.

P. ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

Q. ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

1.2.2 State of California (CA)

A. CA Section 01350. Standard Method for the Testing and Evaluation of Volatile Organic Compound Emissions from Indoor Sources Using Environmental Chambers.

1.2.3 Grenelle Environment Forum

A. Decree № 2011-321. French decree on labeling requirement for construction materials, wall and floor coverings, and paint and varnishes, as it pertains to their emissions of volatile pollutants.

1.2.4 GREENGUARD Environmental Institute (GEI)

A. GREENGUARD Certification. Compliant with stringent emission levels for over 360 VOCs, plus a limit on the total of all chemical emissions combined (TVOC).

B. GREENGUARD Gold. Compliant with safety factors to account for sensitive individuals (such as children and the elderly) and ensures that a product is acceptable for use in environments such as schools and healthcare facilities.

1.2.5 International Organization for Standardization (ISO)

A. ISO 9001: Quality management systems - Requirements

B. ISO 14064-1: Greenhouse gases. Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.

C. ISO 14064-3: Greenhouse gases. Part 3: Specification with guidance for the verification and validation of greenhouse gas statements.

D. ISO 50001: Energy management systems

1.3 SUBMITTALS

Specifier Note: The following are typical submittals. The Specifier may choose to include other submittals he/she deems necessary. Technical and warranty information is available for download at www.mondoworldwide.com or may be obtained from the Technical Department at Mondo America, Inc. (United States 1-800-361-3747 • Canada 1-800-663-8138).

1.3.1 Action Submittals

A. Provide copies of Original Equipment Manufacturer (OEM)'s ISO 9001 certification.

B. Provide current printed data sheets for all Products Supplied.

C. Provide samples, 6 inches x 6 inches, for verification of such characteristics as color and surface texture for each Manufactured Product specified.

D. As necessary, provide shop drawings prepared for project illustrating layouts, details, dimensions and other pertinent data.

1.3.2 Informational Submittals

A. Provide Manufacturer's current printed substrate surface preparation guidelines.

B. Provide Manufacturer's current printed installation guidelines for Products Supplied.

1.3.3 Closeout Submittals

A. Provide Manufacturer's current printed maintenance guidelines for Manufactured Product.

B. Provide Manufacturer's current printed standard warranty for Manufactured Product.

1.3.4 Maintenance Material Submittals

A. Provide extra stock materials from original dye lots, for use in facility operations and maintenance (approximately 2% of the total floor surface for each color, surface texture and format of Manufactured Product specified).

1.4 QUALITY ASSURANCE

A. Manufacturer must have ISO 9001, ISO 14064 and ISO 50001 certifications.

B. Manufacturer must have a minimum of fifteen (15) years of experience in the manufacturing of prefabricated resilient rubber flooring.

C. Manufactured Product must have undergone a vulcanization process; factory lamination should not be accepted as equivalent.

D. Surfacing Contractor to be recognized and approved by the Manufacturer.

E. Surfacing Contractor shall be fully acquainted with the existing facility and utilities and shall fully understand the difficulties and restrictions attending the execution of the work under contract. Surfacing Contractor to advise the Owner of any restrictions or anticipated difficulty, in writing and before submitting bids.

F. Installer must be approved by the Surfacing Contractor and must have performed installations of the same scale in the last three (3) years.

Specifier Note: Specify mock-up dimensions as instructed by Owner or Architect.

G. A mock-up installation is highly recommended; always follow the same procedures and use the same materials that have been specified for the actual project. The Owner or Architect will be responsible for deeming the mock-up acceptable.

- Mock-up size: [XXin x XXin (XX cm x XX cm)].

1.5 DELIVERY, STORAGE AND HANDLING

A. Products Supplied must be delivered in Manufacturer’s original, unopened and undamaged packaging with identification labels intact.

B. Products Supplied must be protected from exposure to harmful weather conditions and must be safely stored on a clean, dry, flat surface. Store rolls of resilient athletic flooring upright; store tiles of resilient athletic flooring on a flat surface, carefully protecting corners and edges.

C. Climate controlled storage is recommended. Storage temperature must not be below 40oF (4oC) and must not exceed 100oF (38oC). Materials must be delivered to site a minimum of 24 hours before work is scheduled to begin so that they may acclimate.

D. Avoid storing Manufactured Product for extended periods of time or additional material trimming may be required.

E. Products Supplied need not suffer damage during delivery, storage and handling (i.e. dents/scratches, excessive compression or warping, chipped edges, etc.).

1.6 SITE CONDITIONS

A. The General Contractor or Construction Manager shall be responsible for ensuring all site conditions meet the requirements of the Manufacturer, as referenced herein at sections 3.2 and 3.3. Refer to current version of ASTM F710 for additional information.

B. Concrete slabs, on or below grade, must be installed over a permanent effective vapor retarder, respecting current versions of the standard practice ASTM E1643 and the standard specification ASTM E1745. The vapor retarder must be placed directly underneath the concrete slab, above the granular fill, per Manufacturer's instructions. The vapor retarder must have a perm rating of 0.1 or less and must have a minimum thickness of 10 mil (0.010 in).

C. No sealers or curing compounds are applied to or mixed into the concrete (refer to Section 03 05 00 – Common Work Results for Concrete of Division 3).

D. Installation of the resilient athletic flooring to be carried out no sooner than the specified curing time of the concrete (normal density concrete curing time is approximately 28 days for development of design strength, having a minimum 3500 psi or 25 MPa in compressive strength).

E. Substrate surface must be free of all contaminants that can inhibit bond (paint, wax, dust, oil or grease, sealer, curing compound, solvent, asphalt, old adhesive residues, etc.). All contaminants must be removed from the surface via mechanical abatement. Use of abatement chemicals is not recommended.

F. Concrete must have a smooth finish, proper density and be highly compacted with a tolerance of 1/8th of an inch in a 10-foot radius (3.2 mm in 3.05 m radius). Floor Flatness (FF) and Floor Levelness (FL) numbers are not recognized.

G. Moisture and alkalinity tests must be performed on all concrete substrates, under in-service conditions. It is recommended to turn on the HVAC unit prior to performing moisture testing, in order to ensure stable testing conditions and accurate results. The concrete's surface pH should be between 7 and 10. Relative humidity of the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with the current version of ASTM F2170 (in situ probes). Moisture vapor emissions from the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with the current version of ASTM F1869 (anhydrous calcium chloride).

H. Maintain stable room and substrate temperatures prior to moisture testing and flooring installation, during the flooring installation, as well as a minimum of 48 hours after the flooring has been completely installed. Recommended ambient temperature range is between 65oF and 86oF (18oC and 30oC) and recommended ambient humidity range is between 35% and 55%.

I. If installing over wood substrates, ensure exterior grade plywood with at least one good side, such as: APA (Engineered Wood Association) Exterior grade plywood (A-A Exterior, A-B Exterior or A-C Exterior) and CANPLY (Canadian Plywood Association) Exterior certified plywood (Canada: Grade G2S A-A or G1S A-C. USA: G2S A-A, A-B, B-B, or G1S A-C, B-C). There must be proper underfloor ventilation, plywood must be dry and should have a moisture content ranging between 6 and 12%, when measured with a quality wood moisture meter (electronic hygrometer).

J. Installation of resilient athletic flooring will not commence until the building is enclosed and all other trades have completed their work. It is the General Contractor or Construction Manager's responsibility to maintain a secure and clean working area before, during and after the installation of the resilient athletic flooring.

1.7 WARRANTY

A. The resilient athletic flooring is warranted to be free from manufacturing defects for a period of one (1) year from the date that is 30 days from shipment from the Manufacturer, per the terms and conditions of the Manufacturer's written Limited Warranty.

B. For standard applications, the resilient athletic flooring is warranted against excessive wear under normal usage for a period of ten (10) years from the date that is 30 days from shipment from the Manufacturer, per the terms and conditions of the Manufacturer's written Limited Warranty. For applications in ice arenas/ice skate use, the resilient athletic flooring is warranted against excessive wear under normal usage for a period of five (5) years from the date that is 30 days from shipment from the Manufacturer, per the terms and conditions of the Manufacturer's written Limited Warranty.

C. Refer to current copy of Manufacturer's written Limited Warranty for all terms and conditions, which shall be obtained directly from Manufacturer. In no event shall any warranties provided by any third parties (including distributors, insurance and/or private label providers) be considered a valid.

PART 2 – PRODUCTS

2.1 MANUFACTURED PRODUCT

2.1.1 Manufacturer

A. Mondo Luxembourg S.A.: Z.I. Foetz - Rue de l'Industrie, L-3895 Foetz, Luxembourg.

2.1.2 Description

Specifier Note: Specify required color(s) and format(s).

A. Sport Impact is prefabricated resilient athletic flooring, calendered and vulcanized, with a base of natural and synthetic rubbers, stabilizing agents and pigmentation, as manufactured by Mondo Luxembourg S.A. or approved equal.

B. Dual durometer construction, vulcanized into a single prefabricated sheet/tile for optimal performance and durability. The Shore hardness of the top layer (wear layer) will be greater than that of the bottom layer (backing); Shore hardness of layers to be recommended by the Manufacturer and to respect limits specified.

C. At Mondo, we pride ourselves on producing premium high-quality rubber flooring products that can be utilized in areas with stringent health and safety controls; we do not use red listed ingredients (2024 LBCRed List CASRN Guide) to manufacture our rubber flooring products, which includes but is not limited to harmful chemicals of concern like bisphenol A (BPA), formaldehyde, halogens, heavy metals, isocyanates, phthalates, polyvinyl chloride (PVC), perfluorinated compounds (PFC) and perfluoroalkyl and polyfluoroalkyl substances (PFA). Also, a product-specific Type III Environmental Product Declaration (EPD) is available for this product. SPORT IMPACT complies with CDPH v1.2-2017 (California Section 01350) and is GREENGUARD Gold certified.

D. Thickness: 0.394'' (10 mm).

E. Colors: Provided in standard, solid background colors with randomly dispersed colored chips throughout the wear layer's entire depth.

F. Surface Texture: Sealskin.

G. Formats: Available in sheets that are 6'1" (1.86 m) wide and 29'6" (9 m) long [min. 19'8" (6 m)/max. 36'1" (11 m)]; available in tiles that are 36" x 36" (91.35 cm x 91.35 cm).

2.1.3 Performance

Specifier Note: Results may vary slightly between production runs, due to manufacturing tolerances and testing methods/equipment used by laboratories during analysis. However, Manufactured Product must always meet the minimum requirements listed.

A. Performance of the Manufactured Product to conform to the following criteria:

Performance Criterion	Test Method	Requirement	Result*
Elongation at Break	ASTM D412	≥100%	≥110%
Tensile Strength	ASTM D412	≥300 psi	≥500 psi
Static Coefficient of Friction (neolite heel)	ASTM D2047	≥0.50 (dry)	≥0.85 (dry)
Hardness of Top Layer (Shore A)	ASTM D2240	80 ± 5	80
Hardness of Bottom Layer (Shore A)	ASTM D2240	70 ± 8	65
Abrasion Resistance (H18 wheel, 1000g, 1000 cycles)	ASTM D3389	≤1.0 g	≤0.6 g
Impact Insulation Class	ASTM E492	-	≈ 59 dB (IIC)
Critical Radiant Flux	ASTM E648	≥0.22 W/cm2 (Class 2)	≥0.45 W/cm2 (Class 1)
Reduction of Bacterial Activity - MRSA (ATC 43300)	ASTM E2180	-	≥99,99% reduction
Thickness	ASTM F386	10 mm (±0.2 mm) 0.394" (±0.008")	Compliant
Resistance to Chemicals	ASTM F925	≤Slight Change	Compliant **
Static Loading (Tested at 250psi)	ASTM F970	≤0.008 in	0.004 in
Heat Resistance	ASTM F1514	ΔE ≤8.0	Compliant
Light Resistance	ASTM F1515	ΔE ≤8.0	Compliant
Reduction of Bacterial Activity - MRSA (ATC 43300)	ISO 22196	-	≥99,999% reduction
Indoor Air Quality (IAQ) Certifications			
CA Section 01350	CA: V1.1-2010	-	Compliant
Greenguard Gold	Greenguard	-	Compliant
Greenguard Certification	Greenguard	-	Compliant
French Decree № 2011-321	ISO 16000-9	-	Compliant (Class A+)

*Results obtained from manufacturing controls can vary between production lots and do not constitute representations or warranties as to any particular production lot. Mondo reserves the right to modify product design and/or specifications at any time without notice.
**For complete list of chemicals tested, concentration and contact time, please communicate with Mondo's Technical Department.

2.1.4 Limitations

A. For areas subject to surface impacts, such as designated free weight areas, it is recommended to adhere the resilient athletic flooring directly to the concrete substrate for optimal performance. Whenever possible, avoid installing resilient athletic flooring on weaker surfaces that may offer less resistance to continuous impacts.

2.1.5 Materials

A. Provide Sport Impact rubber flooring manufactured by Mondo Luxembourg S.A. or approved equal.

B. Provide Manufactured Product as specified in section 2.1.2 Description.

2.2 ACCESSORIES

Specifier Note: Accessories should be specified in accordance with the project requirements.

A. Adhesive certified by Manufacturer: Mondo PU 105 (polyurethane) or Mondo PU300 (epoxy-polyurethane) for installations over concrete and wood substrates. For suitability, recommendations, and use, please refer to the specified adhesive's current printed technical data sheet. For acceptable installations over a Mondo Everlay product (where surface impacts and heavier dynamic loads are not a concern), default to Mondo PU 300 or communicate with Mondo's Technical Department for assistance. High moisture adhesives are available, please contact Mondo's Technical Department for assistance.

B. Portland cement based patching or leveling compound to be supplied or recommended/approved by Manufacturer.

PART 3 – EXECUTION

3.1 INSTALLERS

A. Refer to section 1.4 of this document for information on installers.

3.2 EXAMINATION

Specifier Note: The following must be ensured prior to resilient athletic flooring installation.

A. Prior to resilient athletic flooring installation, ensure substrate is ready to receive resilient flooring and has been prepared according to Manufacturer's current substrate surface preparation guidelines. Refer to current version of ASTM F710 for additional information.

B. Ensure that concrete slabs, on or below grade, are installed over a permanent effective vapor retarder, respecting current versions of the standard practice ASTM E1643 and the standard specification ASTM E1745. The vapor retarder must be placed directly underneath the concrete slab, above the granular fill, per Manufacturer's instructions. The vapor retarder must have a perm rating of 0.1 or less and must have a minimum thickness of 10 mil (0.010 in).

C. Ensure that no concrete sealers or curing compounds have been applied to or mixed into the concrete (refer to Section 03 05 00 – Common Work Results for Concrete of Division 3).

D. Installation of the resilient athletic flooring to be carried out no sooner than the specified curing time of the concrete (normal density concrete curing time is approximately 28 days for development of design strength, having a minimum 3500 psi or 25 MPa in compressive strength).

E. Ensure that concrete surface is free of any contaminant that could inhibit bond (paint, wax, dust, oil or grease, sealer, curing compound, solvent, asphalt, old adhesive residues, etc.). All contaminants must be removed from the surface via mechanical abatement. Use of abatement chemicals is not recommended.

F. Confirm concrete has a smooth finish, proper density and is highly compacted with a tolerance of 1/8th of an inch in a 10-foot radius (3.2 mm in a 3.05 m radius). Floor Flatness (FF) and Floor Levelness (FL) numbers are not recognized.

G. Moisture and alkalinity tests must be performed on all concrete substrates, under in-service conditions. It is recommended to turn on the HVAC unit prior to performing moisture testing, in order to ensure stable testing conditions and accurate results. The concrete's surface pH should be between 7 and 10. Relative humidity of the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with the current version of ASTM F2170 (in situ probes). Moisture vapor emissions from the concrete slab must not exceed the tolerance of the adhesive specified, in accordance with the current version of ASTM F1869 (anhydrous calcium chloride).

H. Ensure room and substrate temperatures are maintained prior to moisture testing and flooring installation, during the flooring installation, as well as a minimum of 48 hours after the flooring has been completely installed. Recommended ambient temperature range is between 65oF and 86oF (18oC and 30oC) and recommended ambient humidity range is between 35% and 55%.

I. If installing over wood substrates, ensure exterior grade plywood with at least one good side, such as: APA (Engineered Wood Association) Exterior grade plywood (A-A Exterior, A-B Exterior or A-C Exterior) and CANPLY (Canadian Plywood Association) Exterior certified plywood (Canada: Grade G2S A-A or G1S A-C. USA: G2S A-A, A-B, B-B, or G1S A-C, B-C). There must be proper underfloor ventilation, plywood must be dry and should have a moisture content ranging between 6 and 12%, when measured with a quality wood moisture meter (electronic hygrometer).

J. Installation of resilient athletic flooring will not commence until the building is enclosed and all other trades have completed their work. It is the General Contractor or Construction Manager's responsibility to ensure that a secure and clean working area is maintained before, during and after the installation of the resilient athletic flooring.

3.3 PREPARATION

Specifier Note: The surface of the concrete (or wood when specified) is to be prepared according to Manufacturer's current printed guidelines; it is recommended that the Specifier review said guidelines. A copy of the substrate surface preparation guidelines can be obtained from the Technical Department at Mondo America, Inc. (United States 1-800-361-3747 • Canada 1-800-663-8138). The guidelines are considered common practice for the preparation and verification of substrates that will be receiving resilient flooring, and as such should not be omitted or altered in any case.

A. Prepare substrate surface in accordance with Manufacturer's current printed guidelines.

3.4 INSTALLATION

Specifier Note: Select appropriate installation guidelines for resilient athletic flooring format required for the project. Products Supplied are to be installed following their current printed guidelines; it is recommended that the Specifier review said guidelines. Copies of all installation guidelines for Products Supplied can be obtained from the Technical Department at Mondo America, Inc. (United States 1-800-361-3747 • Canada 1-800-663-8138). Installation procedures may be altered to accommodate special project needs, as deemed necessary by the Specifier and after he/she has consulted the Technical Department at Mondo America, Inc. to ensure suitability.

A. Install sheets of resilient athletic flooring following Manufacturer's current printed guidelines.

B. Install tiles of resilient athletic flooring following Manufacturer's current printed guidelines.

C. Install all accessories following Manufacturer's current printed guidelines.

3.5 REPAIR

A. Refer to section 1.3.4 for extra stock materials. Repair material must come from the same original dye lot as the Manufactured Product initially installed.

B. Repairs are to be performed by Surfacing Contractor's qualified installers/technicians only.

3.6 CLEANING

A. Always wait at least a minimum of 72 hours after the resilient athletic flooring has been completely installed before performing initial maintenance. Always maintain the resilient athletic flooring following Manufacturer's current printed guidelines.

3.7 PROTECTION

A. As needed, protect resilient athletic flooring with 1/8" Masonite during and after the installation, prior to its acceptance by the Owner.

B. Preserve the integrity of the installation and protect against direct sunlight/UV exposure; always ensure that windows and glass doors have inherent UV protection and/or are fitted with blinds/UV film.

END OF SECTION

SECTION 09 77 00
FIBERGLASS REINFORCED PROTECTIVE WALL COVERING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Fiberglass reinforced plastic (FRP) paneling for wall surfaces, including trim accessories.

1.2 REFERENCES

A. General: Standards listed by reference form a part of this specification section. Standards listed are identified by issuing authority, abbreviation, designation number, title or other designation. Standards subsequently referenced in this Section are referred to by issuing authority abbreviation and standard designation.

B. ASTM International:

1. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.

2. ASTM D5319 – Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.

3. ASTM D5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).

4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

D. Crane Composities (Inspired by Kemlite):

1. Installation Guide For FRP Panels #6876.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meetings: Conduct preinstallation meeting to clarify Project requirements, substrate conditions, manufacturer’s installation instructions and manufacturer’s warranty requirements.

1.4 ACTION SUBMITTALS

A. Product Technical Data: For each type of product required.

B. Shop Drawings: Showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures. Indicate location and dimension of joints and fastener attachment.

C. Samples: Selection and verification samples for finishes, colors and textures. Submit two samples of each type of panel, trim and fastener.

D. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.

E. Test and Evaluation Reports: Showing compliance with specified performance characteristics and physical properties.

F. Manufacturer's Instructions: Manufacturer's Installation Guide for FRP #6876.

G. Qualifications Statements: For manufacturer and installer.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For installed products including maintenance methods and precautions against cleaning materials and methods detrimental to finishes and performance.

B. Warranty: Warranty documents required in this section.

1.6 MAINTENANCE MATERIAL

A. Extra Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 01 Closeout Submittals Section.

1. Quantity: Furnish quantity of units equal to 5% percent of amount installed.
2. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra materials.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Provider of advanced installer training.

B. Installer Qualifications:

1. At least five years experience in the installation of fiberglass reinforced plastic panels.
2. Experience on at least five projects of similar size, type and complexity as this Project.
3. Employer of workers for this Project who are competent in techniques required by manufacturer for installation indicated.

C. Surface-Burning Characteristics: Determined by testing identical products according to ASTM E84 by a testing agency acceptable to authorities having jurisdiction.

1. Flame-Spread Index: 25 (Class A)] or less.

2. Smoke-Developed Index: [450] or less.

1.8 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Package sheets on skids or pallets for shipment to project site.

B. Storage and Handling: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer. Store panels in a dry indoor location at Project site. Remove any foreign matter from face of panel by using a soft bristle brush, avoiding abrasive action.

1.9 PROJECT CONDITIONS

A. Ambient Conditions:

1. Do not begin installation until building is enclosed, permanent heating and cooling equipment is in operation, and residual moisture from plaster, concrete or terrazzo work has dissipated.

2. During installation, and within 48 hours prior to installation, maintain ambient temperature and relative humidity within limits required by type of panel adhesive used and recommendation of panel adhesive manufacturer.

1.10 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace FRP panels that fail within specified warranty period.

1. Failures shall include, but not be limited to substantial defects in material and workmanship, rotting, rusting, corrosion, development of structural surface cracks, or requiring painting or refinishing.

2. Warranty Period: Ten years from date of Substantial Completion.

B. Special Warranty: Installer's standard form in which installer agrees to repair or replace FRP panels that fail due to poor workmanship or faulty installation within the specified warranty period.

1. Warranty Period: 1 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBERGLASS REINFORCED PLASTIC (FRP) PANELS

A. General: Fiberglass reinforced plastic panels complying with ASTM D5319.

1. Low-Emitting Materials: Comply with testing and product requirements of California Department of Health Services standards for Volatile Organic Emissions.

B. Basis of Design Product: Subject to compliance with requirements provide Crane Composites, Inc.; Class A Fiberglass Reinforced Plastic (FRP) Panels, or approved equal.

C. Product Options:

1. Color: As selected by Architect manufactures full color line of Class A FRP products.

2. Surface Finish: As Approved.

3. Nominal Thickness: 0.09 inch (2.3 m)

4. Wall Panel Size: 4 feet (1.2 m) by 8 feet (2.4 m)

2.2 ACCESSORIES

A. Moldings, Trim and Caps: One-piece extruded polypropylene or PVC, configured to cover panel edges and corners.

1. Color: 85 White.

B. Panel Adhesive: As recommended by panel manufacturer for the required substrates.

1. Adhesive shall have a VOC content of 50 g/L or less.

C. Panel Sealant: As recommended by panel manufacturer.

1. Sealant shall have a VOC content of 250 g/L or less.

2.3 SOURCE QUALITY CONTROL

A. Obtain fiberglass reinforced panels, moldings and other accessories from a single manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General: Comply with manufacturer's product data, including product technical bulletins, and installation instructions in product catalogs and product packaging.

B. Verify that substrates previously installed under other sections are acceptable for product installation in accordance with FRP manufacturer's instructions.

1. Examine substrate surfaces to determine that corners are plumb and straight, that surfaces are smooth, sound and uniform, that nails or screw fasteners are countersunk, and that joints and cracks are filled flush and smooth with adjoining surfaces.

2. Do not begin panel installation until substrate surfaces are in satisfactory condition.

3.2 PREPARATION

A. Clean substrates to remove substances that could impair bond of adhesive, including oil, grease, dirt, dust or other contamination.

B. Condition panels by unpacking and placing in installation space no less than 24 hours before installation.

C. Lay out paneling before beginning installation. Locate panel joints to provide equal panel widths at ends of walls and so that trimmed panels at corners are not less than 12 inches (300 mm) wide.

3.3 INSTALLATION

A. General: Comply with panel manufacturer's Installation Guide #6876.

B. Cut and drill panels with carbide tipped saw blades or drill bits, or cut with snips.

C. Install panels with manufacturer's recommended gap for panel field and corner joints.

1. Pre-drill fastener holes in panels, 1/8 inch (3.2 mm) greater in diameter than fastener.

2. Install panels in a full spread of adhesive. For trowel type and application of adhesive, follow adhesive manufacturer's recommendations.

D. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.

E. Sealant:

1. Fill grooves in trim accessories with sealant before installing panels and bed inside corner trim in a bead of sealant.

2. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths.

3.5 CLEANING

A. Remove temporary coverings and protection of adjacent work areas.

B. Repair or replace any installed products that have been damaged.

C. Clean installed panels in accordance with manufacturer's instructions prior to Owner's acceptance.

D. Remove and lawfully dispose of construction debris from project site.

3.6 PROTECTION

A. Protect installed product and finish surfaces from damage during construction.

END OF SECTION

SECTION 09 90 00
PAINTING

1.00 GENERAL

1.01 SUMMARY

A. This Section Includes Paints and Coatings as follows:

1. Painting and finishing all interior and exterior exposed surfaces throughout the Project, except as excluded in Paragraph B below.

2. Surface preparation, priming and coats of paint specified herein are in addition to shop priming and surface treatment specified in other Sections.

3. Paint all exposed surfaces whether or not colors are designated, except where natural finish of the material is obviously intended or specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas.

B. Painting Specified Elsewhere:

1. Shop priming of ferrous metal items included under miscellaneous metal fabrications, hollow metal work, and similar work.

2. Finished (not primed) mechanical and electrical equipment including light fixtures, switchgear and distribution cabinets, except as specified in Article 3.04 herein.

3. Pavement Markings and Wheel Stops

4. Signage: Section 10 14 00.

5. Piping Identification: Division 22.

C. Painting not Included: Do not paint the following surfaces.

1. Concrete Paving or Flatwork (unless indicated paint).

3. Insulation and its facing.

4. Roofing.

5. Finish hardware, except those items noted USP.

6. Finished metal surfaces such as anodized aluminum, stainless steel, chromium-plating, copper, bronze, brass and similar finished materials will not require finish painting.

7. Painting is not required (unless noted paint), on walls or ceilings in concealed and inaccessible areas such as furred areas, pipe spaces, duct shafts and elevator shafts.

8. Operating Parts, Labels and Nameplates:

   a. Do not paint moving parts of operating units, mechanical and electrical parts, such as valve and damper operator linkages, sinkages, sensing devices, motor and fan shafts.

   b. Do not paint over any nameplates, Code required labels, such as UL and FM, or any equipment identification, performance rating, name, or nomenclature plates.

1.02 SUBMITTALS

A. Procedure: In accordance with Section 01 33 23.

B. Materials:

1. Copies of complete materials list, identified by manufacturer's name and product label or stock number.

2. Prepare list in the form of a repetition of the specified paint finishes, with the addition of the specific product intended for each coat.

C. Color Samples:

1. 8-1/2 in. x 11 in. samples of each color for painted finishes.

2. For transparent finishes, prepare the samples on wood specie, which will be used for the Project; 12 in. for lumber; 12 in. square for veneered panels.

D. Certification: Duplicate copies of manufacturer's affidavit with each shipment of materials delivered to the jobsite certifying that each material furnished complies with specified requirements.

1.03 QUALITY ASSURANCE

A. Compliance with Air Quality Regulations: VOC of coatings used for this work shall not exceed limits prescribed by law.

B. Sample Panels:

1. Apply sample paint finishes (approximately 10 ft. square) of each color scheme to wall areas, as directed by the Architect. Refer to this section for painting cement plaster sample panel and also for painting gypsum board mock-up.

2. Obtain Architect's approval of sample panels before proceeding further. Approved sample panels will be used as a standard for the Project, and if properly identified may remain a part of the Work.

3. Final acceptance of colors will be from job-applied samples.

1.04 JOB CONDITIONS

A. Environmental Requirements:

1. Comply with paint manufacturer's recommendations for environmental conditions regarding paint application. Provide adequate heating and ventilating to maintain environmental conditions recommended by paint manufacturer.

2. Do not apply finish in areas where dust is being generated.

B. Provide drop cloths, shields, barricades and other protection necessary to safeguard adjacent surfaces not to be painted.

1. Post signs immediately after painting.

2. Provide and maintain protection as required to protect finished work from damage until its acceptance.

C. Illuminate work area during installation to provide the same or greater level of illumination, as required to properly perform the work, as will occur in the room or space after the building is in operation.

1.05 HANDLING

A. Procedure: In compliance with Section 016600.

B. General: Take all necessary precautions to prevent fire. Remove soiled rags and other waste items from premises at the end of each day's work.

1.06 WARRANTY

A. Color of exterior surfaces painted as part of the Work of this Section shall, at the end of one year, have remained free from serious fading when compared to a control sample of the original paint.

B. Paint shall have its original adherence at the end of one year and there shall be no evidence of blisters, running, peeling, scaling, chalking, streaks, or stains at the end of this period.

C. Washing painted surfaces with alkali-free soap and water shall remove surface dirt from painted surfaces without producing deteriorating effects.

1.07 MAINTENANCE MATERIAL

A. With closeout submittals deliver one identified unopened gallon of each type and color of paint material used on the Project to the District for future paint touch-up.

B. In addition to manufacturer’s label, identify with room number, floor of area, type of paint,

color and sheen, as applicable, for future identification.

2.00 PRODUCTS

2.01 PAINT

A. Definition: The term "paint" as used in this Section means all coating system components, including primers, emulsions, enamels, varnishes, stains, lacquers, sealers, fillers, and other applied materials whether used as prime, intermediate or finish coat.

B. Quality and Manufacture: Insofar as practicable each paint shall be factory-mixed to match approved samples and colors, and be of a consistency permitting immediate application. Use best quality grade regularly manufactured by PPG Paints, except as may be specified below.

C. Paint Uniformity and Compatibility:

1. Paint shall be boxed at the job site or factory-batched to ensure color uniformity and consistency. This includes the required maintenance materials.

2. Provide finish coats compatible with prime coats used.

   a. Review other Sections of these Specifications, in which prime coats are specified, and manufacturer's data for shop-primed surfaces to be painted.

   b. Be responsible for compatibility of the total coating system.

3. Provide barrier coats over incompatible primer or remove and reprime.

4. Products of more than one approved manufacturer may be used, except that all products applied on a surface shall be by the same manufacturer.

2.02 COLOR SCHEDULES

A. The Architect will prepare a color schedule with samples for guidance in painting.

B. The Architect may select, allocate, and vary colors on different surfaces throughout the Work, subject to the following:

1. Exterior Work: A maximum of 5 different colors will be used, with variations for trim, doors, miscellaneous work, and metal work.

2. Dark Tones: A maximum of 10 dark tones will be used as accent colors for interior.

3.00 EXECUTION

3.01 INSPECTION

A. Examine surfaces to be painted for conditions that would adversely affect the

permanence and quality of this work. Make sure that unsuitable conditions are corrected before proceeding with painting.

3.02 SURFACE PREPARATION

A. Prepare surfaces to receive specified finishes in compliance with paint manufacturer's printed instructions and the following:

1. Galvanized Steel:

a. Clean with commercial phosphoric acid solution or prepared product approved by the paint manufacturer for pretreatment.

b. Then recoat within the time limit recommended by the primer manufacturer.

2. Shop-Coated Metal: Remove oil, grease, dirt and foreign matter. Spot prime abraded surfaces with compatible primer.

3. Shop-Finished Metal: Sand to provide a mechanical bond with field applied finishes, or use a commercial preparation specifically formulated to improve paint bond.

4. Unprimed Ferrous Metal: Remove rust, mill scale, oil and other foreign matter.

5. Factory-Primed Equipment: Repair damaged primer; remove rust and clean to bright metal where appropriate. Sand or etch primer to permit bonding of finish coats. Clean surfaces thoroughly before applying additional coats.

6. Plaster:

a. Clean surfaces of dirt, laitance, encrustations and foreign matter.

b. Patch cracks, holes, pits and other imperfections, not patched under other Sections, flush and smooth with adjacent surfaces.

c. Do not apply sealer or paint when the moisture content of the surfaces to be painted exceeds 8%. Touch-up suction spots after priming with an additional prime coat until all surfaces show a uniform coating.

7. Gypsum Board:

a. Remove dust, loose particles or other matter that would prevent proper paint adhesion.

b. Check to see that joints and screw heads are properly covered with joint compound and sanded smooth and flush with adjacent surfaces.

8. Wood:

a. Sandpaper smooth and dust clean. Remove handling marks and raised

grain.

b. Fill nail holes, cracks and depressions with wood filler, colored to match finish for wood scheduled to receive a transparent finish. Use a tack cloth on wood to receive a transparent finish to remove sanding dust.

9. Other Materials not Covered Above: Prepare to receive paint in compliance with the paint manufacturer's printed instructions.

B. Hardware:

1. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures and similar items in place and not to be painted, or provide surface-applied protection prior to surface preparation and painting.

2. Following completion of painting each space or area, reinstall the removed item by workmen skilled in the trades involved.

C. Phasing: Program cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

3.03 PAINT PREPARATION

A. Open paint containers only as required for use. Mix paint in designated areas.

B. Thoroughly stir and agitate paint to uniformly smooth consistency suitable for proper application.

C. Do not reduce, change or use any materials except in compliance with manufacturer's printed instructions.

D. In all cases, prepare and handle paint to prevent deterioration and inclusion of foreign matter.

3.04 APPLICATION

A. General:

1. For doors scheduled to receive a transparent finish, seal top and bottom with a heavy coat of spar varnish immediately after trimming.

2. Where the 2 faces differ in color or finish, finish the edges to match the door face visible when the door is open.

3. Apply paint only under conditions that will insure finishes free from blemishes and defects. Leave corners with no undue amount of paint buildup.

4. Use a slightly different shade for each coat of paint so that it may be readily

identified.

5. Primer and intermediate coats shall be unscarred and completely integral when succeeding coats are applied. Sand and dust between each coat to remove defects visible from a distance of 5 ft.
6. Remove paint spillage and spatters on adjacent surfaces so as not to damage the surface being cleaned.

    a. Perform patching and repairs required because of painting operations.

    b. Refinish entire panel or assembly where portion of finish has been damaged or is not acceptable to the Architect.

7. Paint interior surfaces of ducts, where visible thru registers and grilles, with a flat non-specular black paint.

8. Unless otherwise directed by the Architect, spray-paint exposed surfaces of ceiling diffusers, air return grilles, speakers and other electrical and mechanical items, except smoke detectors and sprinkler heads, in painted ceilings to match the ceilings, whether these items are primed or factory-finished.

9. Number of Coats:

    a. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried.

    b. The number of coats specified is the minimum required for complete coverage and uniformity of color.

    c. Apply additional coats when undercoats, stains, or other conditions show through the final finish until the finish is of uniform color and appearance.

10. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.

11. Paint interior surfaces, which are a continuation of exterior surfaces, subject to exterior exposure (such as an out-swinging door), with the applicable exterior coating system.

12. For opaque finishes, completely cover surfaces to be painted to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Painted surfaces with cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other imperfections will not be acceptable.

13. For transparent finishes, apply multiple coats to produce a glass-smooth surface film of even luster, free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, and other surface imperfections.

14. Completed work shall match approved samples, as determined by the Architect. Remove, refinish, or repaint work not complying with specified requirements.

B. Application Method: In general the application method, brush, roller or spray, is the Contractor's option.

C. Priming:

1. Prime bare metal scheduled to be painted, and not embedded in concrete and masonry, immediately upon delivery to the site.

2. Time lapse between priming and application of second coat shall be as short as possible.

D. Shop Primed Metal:

1. Apply 2 finish coats of paint to match adjoining surfaces, as directed by the Architect, to shop primed mechanical equipment. This work includes but is not limited to interior of fire hose cabinets, air grilles, ceiling diffusers, electrical and telephone panels, and access panels.

2. Paint conduits, outlets and pull boxes, and mechanical equipment exposed to view, such as covered and uncovered piping and ductwork, pumps, compressors, air conditioning equipment and tanks as specified in this Section.

3. Paint the back side of access panels, removable or hinged covers to match the exposed surfaces.

E. Miscellaneous Painting: Surfaces to be painted and not specifically described herein, shall be painted with a product specifically manufactured or prepared for the material and surface to be painted with a prime and 2 finish coats.

3.05 PAINT FINISH SCHEDULE

A. Finish all surfaces in compliance with the following schedule. Catalog names and numbers refer to product as manufactured by Dunn Edwards Corp., except as otherwise specified.

B. Exterior Surfaces:

1. Concrete, Concrete Masonry Units, Portland Cement Plaster, and Stucco:

1st Coat - PPG 4-503 Perma-Crete Concrete & Stucco Primer, Alkali Resistant
2nd & 3rd Coats - PPG 6-901xi Speedhide Ext 100% Acrylic Semi-Gloss.

2. Steel, Iron, Galvanized, Copper:

1st Coat - PPG 90-709 Pitt-Tech Acrylic Industrial DTM Primer.
2nd & 3rd Coats - 90-374 (Gloss) 90-474 (Satin) Pitt-Tech Acrylic Industrial DTM Enamel.

3. Exterior Wood Surfaces:

1st Coat - PPG 17-921xi Seal Grip Int/Ext Universal Sealer/Primer.
2nd & 3rd Coats - PPG 6-901xi Speedhide Ext 100% Acrylic Semi-Gloss.

4. Metal Doors & Frames:
1st Coat (pre-primed surface) - PPG 17-921xi Seal Grip Int/Ext Universal Sealer/Prime (bare metal) PPG 90-709 Pitt-Tech Acrylic Industrial DTM Primer.
2nd & 3rd Coats - PPG 6-901xi Speedhide Ext 100% Acrylic Semi-Gloss.

5. Ferrous Metal - Extreme Corrosion Protection for Industrial Applications:

1st Coat - PPG Amercoat 68 HS VOC 3 Component Zinc Rich Epoxy Primer
2nd Coat - PPG Amerlock 2 Two Component High Solids Epoxy
3rd Coat - PPG Amershield VOC Two Component Polyester Acrylic Polyurethane

C. Interior Surfaces:

1. Gypsum Board, Plaster, & Concrete:

1st Coat - PPG 6-2 Speedhide Interior Latex Sealer
2nd & 3rd Coats - PPG 6-500 Speedhide Interior Latex Semi-Gloss

2. Steel, (ferrous) Iron, Galvanized & Copper:

1st Coat - PPG 90-709 Pitt-Tech Acrylic Industrial DTM Primer
2nd & 3rd Coats - 90-374 (Gloss) 90-474 (Satin) Pitt-Tech Acrylic Industrial DTM Enamel

3. Wood, Painted:

1st Coat - PPG 17-921xi Seal Grip Int/Ext Universal Sealer/Primer
2nd & 3rd Coats - PPG 6-500 Speedhide Interior Latex Semi-Gloss

4. Wood, Finished:

Stain if Desired
Finish - PPG Deft Acrylic Polyurethane

END OF SECTION

SECTION 10 14 00
SIGNAGE

1.00 GENERAL

A. Requirements of Division 1 apply to this Section.

1.01 SCOPE

A. Signage as shown on the drawings and as specified, including but not limited to the following major items:

1. Disabled access parking signs and gate signs.

2. Building identification signs.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Paint finish

1.03 SUBMITTALS

A. Type face and colors - submit per Section 01 33 23.

1.04 DESIGN

A. Work shall conform to Americans with Disabilities Act, ANSI A-117.1.\

B. Raised characters shall comply with 11B-703.2

C. Braille shall comply with 11B-703.3

D. Visual characters shall comply with 11B-703.5

E. Approved Systems (Manufacturers):

1. ASI/Modulex, Inc. (213) 645-1400.

2. Kroy, (800) 733-5769.

3. Mowhawk Sign Systems, Inc. (518) 370-3433.

4. California Contract, (818) 503-7241.

2.00 MATERIALS

2.01 PLAQUE SIGNS

A. Number Signs: Mount on a base - 1 1/8" inch high x 5 inches long. Type face - modified Helvetica. Number size 9/16 inch high. Provide Braille symbols. Secure adjacent to door, where indicated. Similar to: ASI infinity; SPE-SA.

B. Text Signs: Mount on a base - 1 1/8-inch-high x varying lengths. Type face - modified Helvetica. Letter size - 9/16" inch high, supper and lower case. Provide Braille symbols. Secure adjacent to door, where indicated. Similar to: ASI infinity; SPE-SA.

C. Occupancy Sign: Where required and noted on the drawings. Header 2 1/2-inch-high with letters 1 1/4 inches high. Text letter size 9/16 high. Type faces modified Helvetica upper and lower case. Mount to a common base. Similar to: ASI infinity; SPG-SA.

2.02 PERMANENT TEXT SIGNS

A. Directional and informational signs required by Title 24 CCR and the ADA as shown on the drawings shall have the test silver or vinyl die cut in signs as noted. Similar to ASI infinity SOG-SA.

2.03 PERMANENT TEXT - EXTERIOR

A. Size as required to provide text stated using 1-inch-high letters, upper and lower case modified Helvetica, and other text.

B. Material: Fiberglass base, with urethane finish and silk screened graphics, protected with a transparent matte finish. Similar to ASI GOF series.

C. Mounting: Screws 1/4-inch diameter, corrosion and vandal resistant, self drilling.

2.04 Not Used

2.05 DISABLE ACCESS SIGNS, OCCUPANCY SIGNS

A. Header 1 3/4" high with silk screened baked enamel letters 1" high. Type face": - modified Helvetica upper and lower case.

B. Header shall slide into an aluminum frame with a smooth panel base of a size required to accommodate the text indicated. Text letter size - 9/16", upper and lower case. Mounting of the base - vandalproof wood screws into solid backing. Provide locking type clear plastic cover. Modulex System "Interior 10".

C. Free-standing exterior disabled signs, traffic control and other exterior signs: Traffic Control Service, Inc. (800) 222-8274, Zumar Industries (323) 724-8450 or Western Highway Products, Inc. (714) 761-4811.

2.06 EXTERIOR BUILDING IDENTIFICATION SIGNS

A. Non-illuminated, reverse channel, brushed aluminum where and as shown on the drawings. Contact Innerface Sign Systems, Inc. 5320 Webb Parkway, Lilburn (Atlanta), GA 30047, (800) 445-4796.

3.00 EXECUTION

3.01 PERMANENT TEXT

A. Permanent text not indicated in Contract Drawings will be furnished at the time that submittals are returned.

3.02 INSTALLATION

A. Install where indicated. Signs shall be a complete vandal resistant installation. Fasteners shall be concealed, in drilled holes, counter sunk where indicated. Signs shall align with adjacent lines and edges, be level, flat on the mounting surface.

B. Free-standing information/direction exterior signs: Shall be mounted on a 2” x 2” galvanized tube steel post that has pre-drilled with mounting holes. The post shall be anchored into a 12” x 18” deep concrete footing.

C. Building Wall Signs: Install as recommended by the manufacturer. Fasteners shall be concealed, in drilled holes, counter sunk where indicated. Signs shall align with adjacent lines and edges, be level, flat on the mounting surface.

END OF SECTION

SECTION 10 21 13
TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Floor-mounted overhead-braced high density polyethylene (HDPE) toilet compartments.

2. Wall mounted HDPE urinal screens.

3. Supplementary parts and components, such as inserts, clips, fasteners, anchors, and other miscellaneous supports required for a complete installation.

A. Related work:

1. Toilet Accessories: Section 10 28 16.

1.2 SUBMITTALS

A. Procedure: In accordance with Section 01 33 23.

B. Data: Manufacturer's data for partitions and screens. Supplement with shop drawings showing plan layout, attachment to adjacent construction.

C. Samples:

1. 6 in. square of each color of selected panel material.

2. Full size samples of hardware.

1.3 HANDLING

A. Procedure: In accordance with Section 01 66 00.

B. Protection: Maintain manufacturer's protective covers on panels as long as possible to protect them from damage.

1.1 WARRANTY

A. Warrant materials against breakage, corrosion and delamination for 10 years after Substantial Completion. Repair defective materials, at no cost to District, within warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Hiny Hiders by Scranton Products.

2.2 MATERIALS

A. General:

1. Provide materials selected for surface flatness and smoothness.

2. Exposed surfaces which exhibit defects, discolorations, and other imperfections are not acceptable.

B. Solid plastic: High density, solid polymer resin, either monolithic polyethylene or polymer resin, with homogenous color throughout, of color(s) selected by Architect.

1. Provide monolithic material not less than 1 in. thick. Ease edges uniformly.

C. Pilaster shoes and caps: Formed one-piece plastic.

D. Panel brackets: Manufacturer's full length standard design for attaching panels to walls and pilasters, extruded anodized aluminum.

E. Hardware and accessories: Manufacturer's standard design, heavy duty operating hardware and accessories of chromium plated, non-ferrous cast alloy (Zamac).

F. Anchorages and fasteners: Manufacturer's standard exposed fasteners of stainless steel, chromium-plated steel, or brass, finished to match hardware, with theft-resistant type heads and nuts.

1. Concealed anchors: Hot-dip galvanized, cadmium-plated or other rust-resistant protective coated steel.

2.3 FABRICATION

A. Fabricate units with cutouts, drilled holes, and internal reinforcement to receive partition-mounted hardware, accessories, and grab bars, as indicated.

B. Floor-supports: Furnish galvanized steel anchorage devices complete with threaded rods, lock washers, and leveling adjustment nuts at pilasters to permit structural connection at floor.

1. Provide shoe at each pilaster to conceal anchorage.

C. Wall-hung screens: Furnish panels of same construction and finish as partition system panels.

D. Hardware: Provide for each compartment complying with ANSI A117.1 for disabled accessibility and as follows.

1. Hinges: Cutout inset type, adjustable to hold door open at any angle up to 90 deg. Provide gravity type, spring-action cam type, or concealed torsion rod type to suit manufacturer's standards.

2. Latch and keeper: Manufacturer's standard surface mounted latch unit, designed for disabled accessibility, with combination rubber-faced door strike and keeper.

3. Coat hook: Manufacturer's standard unit, combination hook and rubber-tipped bumper, sized to prevent door hitting mounted accessories. Mount on back side of door, at 48 in. height.

4. Door pull: Manufacturer's standard unit for out-swinging doors. Provide pulls on both faces of disabled compartment doors.

E. Disabled Access Law Compliance:

1. Layouts of enclosures designated as enclosures for the disabled and hardware provisions therefore shall comply with current disabled access requirements in the California Code of Regulations, Title 24 and ADA Accessibility Guidelines for Buildings and Facilities.

2. Toilet compartments for the disabled shall be provided with the following, together with all other requirements:

a. Doors shall be not less than 36” wide.

b. Coat hooks shall be mounted at 48” high, maximum.

c. Door latches shall be flip-over style, sliding, or other hardware not requiring the user to grasp or twist.

d. Inside and outside of enclosure doors for the disabled shall be equipped with a loop or U-shaped handle immediately below the latch. The latch shall be flip-over style, sliding, or other hardware not requiring the user to grasp or twist. Model No. RP100S-P by MSI (805.375.6599).

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify conditions and measurements affecting the work of this Section at site. Make sure thatdetrimental conditions are corrected before proceeding with installation.

3.2 INSTALLATION

A. Set compartments and screens plumb, level, and space uniformly in compliance with their manufacturer's printed instructions and the following.

B. Set pilasters with anchorages having not less than 2 in. penetration into structural floor, unless otherwise recommended by compartment manufacturer.

1. Level, plumb, and tighten installation with devices furnished.

2. Hang doors and adjust so that tops of doors are level with tops of pilasters when doors are in closed position.

C. Secure panels to panels, and panels to walls with continuous extruded aluminum angles.

1. Anchor panels to studs or backing plates only, with tamper-proof bolts or screws; fastening components to walls with toggle bolts will not be allowed.

D. Install hardware as recommended by manufacturer. Conceal evidence of drilling in finished work.

3.3 ADJUSTING/CLEANING

A. Adjust brackets and hardware to provide uniform clearances not exceeding the following dimensions:

1. Pilasters and walls: 1 in.

2. Panels and walls: 1 in.

3. Pilasters and panels: 2 in.

4. Pilasters and doors: 3/16 in.

B. Adjust hardware for proper operation. Set hinges on in-swinging doors to hold open approximately 30 deg. from closed position when unlatched, except set hinges on out-swinging doors (and entrance swing doors) to return to fully closed position.

C. After completion of installation, clean and polish exposed surfaces and touch-up minor scratches.

END OF SECTION

SECTION 10 28 16
TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Toilet room accessories, including framed mirrors.

2. Supplementary parts and components, such as inserts, clips, anchors, fasteners, and other miscellaneous supports required for a complete installation.

B. Related work:

1. Cut-outs, openings and recesses for installation of accessories.

1.2 SUBMITTALS

A. Data: Manufacturer catalog cuts and data sheets, complete parts list, and installation requirements for each accessory specified.

B. Schedule: Indicate types, quantities, sizes, and installation locations (by room) for each toilet accessory item to be provided for Project.

C. Closeout: Furnish to the District operating instructions and keys for equipment and locks.

1.3 QUALITY ASSURANCE

A. Compliance with ADA requirements for accessories and their attachments is the Contractor's responsibility.

1.4. HANDLING

A. Protection: Keep protective covers on accessories until their installation is complete, then remove at final clean-up.

1.5. WARRANTY

A. Provide the District the manufacturer warranty protecting mirrors against silver spoilage for 5 years after Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless steel: AISI Type 302/304 complying with ASTM A167.

B. Sheet steel: Cold-rolled commercial quality, complying with ASTM A336, 20 gage minimum.

1. Galvanized steel: ASTM A527, G60 zinc coating, 20 gage minimum.

C. Mirrors: 1/4 in. "Silvering Quality" float glass with silver coating, copper protective coating and 2 mil thick protective paint; complying with CS 27.

D. Mounting devices: Galvanized steel.

E. Fasteners: Stainless steel where exposed; may be galvanized steel where concealed. Provide spanner head design where exposed.

2.2 FABRICATION

A. Fabricate units with seamless one piece flanges on exposed faces.

1. Miter corners, weld and grind smooth and flush with parent metal so that welds are invisible on exposed surfaces.

2. Open joints (not fully welded) on exposed surfaces are not acceptable.

3. Conceal anchoring devices.

B. Hang doors or panels on continuous stainless steel piano hinges.

C. Master-key locked dispensing units. Key coin boxes of coin-operated dispensing units separately from the lock on the unit.

D. Grind smooth all edges, both inside and out.

E. Finishing:

1. Finish exposed surfaces with bright, directional polish, NAAMM No. 4 finish so grain direction is parallel with the length of the component (horizontal or vertical) for all accessories, except where a knurled surface is specified for grab bars.

2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect adjacent construction and supports.

B. Make sure that openings are within allowable tolerances, plumb, level, clean, will provide a solid anchoring surface, and that other conditions detrimental to the proper or timely completion of this work are corrected before proceeding with installation.

3.2 INSTALLATION

A. Drill holes to correct size and location. Install accessories plumb, level and equally spaced (when applicable).

B. Attach accessories securely with screws or bolts to steel studs or backing plates. Do not use Molly or toggle bolts in gypsum board.

C. Adjust accessories for proper operation. After completion of installation, clean and polish exposed surfaces after removal of protective coverings.

3.3 ACCESSORY SCHEDULE:

A. As indicated on the drawings.

END OF SECTION

SECTION 10 44 13
FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes fire protection cabinets for fire extinguishers.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each exposed product and for each color and texture specified.

D. Maintenance data.

1.3 QUALITY ASSURANCE

A. Fire-Rated, Fire Protection Cabinets: Listed and labeled to comply with requirements in ASTM E 814 for fire-resistance rating of walls where they are installed.

B. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

C. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless-Steel Sheet: ASTM A 666, Type 304.

B. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 2 (tinted, heat absorbing, and light reducing), bronze tint.

2.2 FIRE PROTECTION CABINET

A. Cabinet Type: Suitable for fire extinguisher.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Fire End & Croker Corporation.

b. J. L. Industries, Inc., a division of Activar Construction Products Group;.

c. Kidde Residential and Commercial Division, Subsidiary of Kidde plc;.

d. Larsen's Manufacturing Company;.

e. Modern Metal Products, Division of Technico Inc.; .

f. Moon-American; .

g. Potter Roemer LLC; .

h. Watrous Division, American Specialties, Inc.

B. Cabinet Construction: Nonrated.

C. Cabinet Material: Stainless-steel sheet.

1. Semirecessed Cabinets: Cabinet box partially recessed in walls of sufficient depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend). Provide where walls are of insufficient depth for recessed cabinets but are of sufficient depth to accommodate semirecessed cabinet installation.

a. Square-Edge Trim: 1-1/4- to 1-1/2-inch (32- to 38-mm) backbend depth.

b. Rolled-Edge Trim: 2-1/2-inch (64-mm)] backbend depth.

D. Cabinet Trim Material: Same material and finish as door.

E. Door Material: Stainless-steel sheet.

F. Door Style: FullCenter glass panel with frame.

G. Door Glazing: Tempered float glass (bronze tint).

H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.

I. Accessories:

1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

2. Break-Glass Strike: Manufacturer's standard metal strike, complete with chain and mounting clip, secured to cabinet.

3. Door Lock: Cam lock that allows door to be opened during emergency by pulling sharply on door handle.

4. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated.

a. Identify fire extinguisher in fire protection cabinet with the words "FIRE EXTINGUISHER."

1) Location: Applied to cabinet door.

2) Application Process: Engraved.

3) Lettering Color: Red.

4) Orientation: Horizontal.

J. Finishes:

1. Stainless Steel: No. 2B.

2.3 FABRICATION

A. Fire Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Miter and weld joints and grind smooth.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine walls and partitions for suitable framing depth and blocking where semi-recessed cabinets will be installed and prepare recesses as required by type and size of cabinet and trim style.

B. Install fire protection cabinets in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

C. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.

D. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.

E. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 10 44 16
FIRE EXTINGUISHERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes portable, hand-carried fire extinguishers.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Operation and maintenance data.

C. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."

B. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

C. Coordinate type and capacity of fire extinguishers with fire protection cabinets to ensure fit and function.

1.4 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace fire extinguishers that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Failure of hydrostatic test according to NFPA 10.

b. Faulty operation of valves or release levers.

2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PORTABLE, HAND-CARRIED FIRE EXTINGUISHERS

A. Fire Extinguishers: Type, size, and capacity for each fire protection cabinet indicated.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Amerex Corporation.

b. Ansul Incorporated; Tyco International Ltd.

c. Badger Fire Protection; a Kidde company.

d. Buckeye Fire Equipment Company.

e. Fire End & Croker Corporation.

f. J. L. Industries, Inc.; a division of Activar Construction Products Group.

g. Kidde Residential and Commercial Division; Subsidiary of Kidde plc.

h. Larsen's Manufacturing Company.

i. Moon-American.

j. Pem All Fire Extinguisher Corp.; a division of PEM Systems, Inc.

k. Potter Roemer LLC.

l. Pyro-Chem; Tyco Safety Products.

2. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B.

B. Clean-Agent Type in Steel Container: UL-rated 1-A:10-B:C, 10-lb (4.5-kg) nominal capacity, with HFC blend agent and inert material in enameled-steel container; with pressure-indicating gage.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged fire extinguishers.

END OF SECTION

SECTION 22 00 00
PLUMBING

PART 1 – GENERAL

C. GENERAL PROVISIONS

1. General Provisions of the contract including General and Supplementary Conditions apply to the work specified in this Section.

D. SCOPE.

1. Work Included. Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:

    a. A complete system of sanitary soil, waste and vent piping including connection to existing waste, and drain connections to all fixtures and equipment.

    b. A complete system of hot and cold water piping including connection to existing and connections to fixtures and equipment.

    c. Condensate drains from air conditioning and refrigeration units.

    d. Furnishing, mounting and final connections to fixtures and equipment as shown or scheduled on the plumbing and architectural drawings that is part of any system listed above.

    e. Final connections to equipment provided in other sections of these specifications or indicated as furnished by owner and installed by the contractor.

    f. Demolition of all plumbing fixtures, equipment and piping systems indicated or required to be removed or modified.

    g. Acceptance testing as required under California Building Energy Efficiency Standards, Title 24.

E. CODES AND STANDARDS

1. All work and materials shall conform with current rules and regulations of applicable codes. Nothing in these Drawings or Specifications is to be construed to permit work not conforming to these codes. Should the Drawings or Specifications call for material or methods of construction of a higher quality or standard than required by these codes, the Drawings and Specifications shall govern.

    a. Applicable codes and standards shall include but are not necessarily limited to:

        i. <u>California Code Of Regulations:</u>

1. Title 8, Industrial Relations
2. Title 17, Public Health
3. Title 19, Public Safety
4. Title 21, Public Works
5. Title 24, Energy Regulations

ii. California Building Code.

iii. California Mechanical Code

iv. California Plumbing Code

v. American Society for Testing and Materials (ASTM)

vi. American Water Works Association (AWWA)

vii. Cast Iron Soil Pipe Institute (CISPI)

viii. California Electrical Code (CEC)

ix. National Electrical Manufacturers Association (NEMA)

x. National Fire Protection Association (NFPA)

xi. National Sanitation Foundation (NSF)

xii. Occupational Safety and Health Act (OSHA)

xiii. Plumbing and Drainage Institute (PDI)

xiv. Americans with Disabilities Act. Accessibility Guidelines for Buildings and Facilities. (ADAAG).

F. PERMITS AND FEES

1. The Contractor shall take out all permits and arrange for all tests in connection with such work as required. All charges are to be included in the work. All charges or fees for service connections, meters, etc., shall be included in the work.

G. COORDINATION OF WORK

1. Before starting any work, thoroughly examine all existing and newly completed underlying and adjoining work and conditions upon which the installation of this work is in any way dependent for the workmanship required by the Contract Documents. Report to the Architect and Engineer in writing any and all conditions which might adversely affect this work and limit ability to perform the required workmanship.

2. Layout of materials, equipment and systems is generally diagrammatic unless specifically dimensioned. The actual locations of all materials, piping, ductwork, fixtures, equipment, supports, etc., shall be carefully planned, prior to installation of any work, to avoid all interference's with each other, or with structural, electrical or architectural elements. Verify the proper voltage and phase of all equipment with the electrical plans. All conflicts shall be called to the attention of the Engineer prior to the installation of any work or the ordering of any equipment.

3. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. Carefully investigate the mechanical, electrical, structural, architectural drawings and field conditions that could affect the work to be performed and arrange such work accordingly. Provide the required piping and ductwork offsets, fittings, and accessories to meet such conditions.

4. Spaces provided in the design of the building shall be utilized and the work shall be kept within walls or furring lines established on the drawings. Any discrepancy between Architectural or Mechanical drawings with respect to wall or furring locations and dimensions shall be brought to the Architect's attention for resolution before proceeding with installation.

5. Any work which is done as an addition, expansion, or remodel of and existing system shall be compatible with that system

H. MANUFACTURER'S RECOMMENDATIONS

1. All material, equipment, and devices, etc., shall be installed in a manner meeting approval of the manufacturer of the particular item. The Contractor shall make himself available of all installation manuals, brochures, and procedures that the manufacturer issues for the equipment and material. Contractor shall be held responsible for all installations contrary to the manufacturer's recommendations. Contractor shall make all necessary changes and revisions to achieve such compliance.

I. GUARANTEE

1. Guarantee shall be in accordance with the General Conditions. These Specifications may extend the period of the guarantee for certain items. Where such extensions are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the certificate of guarantee shall be furnished to the Owner.

J. QUIETNESS

1. Piping of all types, ductwork, and equipment shall be arranged and supported so that the vibration is at a minimum and is not transmitted to the building structure.

K. DAMAGES BY LEAKS

1. The Contractor shall be responsible for damages caused by leaks in the temporary or permanent piping or mechanical systems prior to completion of work and during the period of the guarantee.

L. SUBMITTALS

1. Shop Drawings. Within 30 days of contract award, the Contractor shall submit six copies of shop drawings for all materials, equipment, etc., proposed for use on this project. Material or equipment shall not be ordered or installed until written review is processed by the Engineer. Any item omitted from the submittal shall be provided as specified without substitution. All shop drawings must comply with the following:

    a. Shop drawings are required for all material and equipment items and shall include manufacturer's name and catalog numbers, dimensions, capacities, performance curves, and all other characteristics and accessories as listed in the contract documents. Descriptive literature shall be current manufacturer's brochures and submittal sheets.

    b. All shop drawings shall be submitted at one time in a three hole binder with title sheet including Project Title, Architect, Engineer, Contractor, table of contents, and indexed tabs dividing each group of materials or item of equipment. All items shall be identified by the specification paragraph number for which the are proposed. All equipment shall also be identified by the mark number as indicated on drawings. Submittals shall bear the stamp of certification by the Contractor as evidence that the Contract Documents (Specifications and Drawings) have been thoroughly checked.

    c. All capacities, characteristics, and accessories called for in the specifications or on the drawings shall be high-lighted, circled or underlined on the shop drawings. Data must be complete enough to permit detailed comparison of every significant characteristic which is specified, scheduled or detailed.

2. Review. Submittals will be reviewed for general conformance with the design concept, but this review does not guarantee quantity shown, nor does it supersede the responsibility of the Contractor to provide all materials, equipment and installation in accordance with the drawings and specifications. The Contractor shall agree that shop drawing submittals processed by the Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.

    a. If deviations, discrepancies or conflicts between shop drawings and design drawings and specifications are discovered either prior to or after shop drawing submittals are processed by the Engineer, the design drawings and specifications shall control and shall be followed. Submittals for products and equipment offered as an alternate to that specified will require, if accepted by the Engineer, resubmission of the Title 24 Energy Compliance Calculations if the specified product or equipment was included within the scope of the approved calculations on file with the reviewing authority. The cost of preparing resubmission will be the responsibility of the Contractor.

M. OPENINGS, CUTTING AND PATCHING

1. The locations and dimensions for openings through walls, floors, ceilings, foundations, footings, etc. required to accomplish the work under this Specification Division shall be provided under this Division. Except as noted below, the actual openings and the required cutting and patching shall be provided by other Divisions. Coring through existing concrete or masonry walls, floors or asphaltic concrete required to accomplish the work under this Specification Division shall be provided under this Division. Restoration of all surfaces shall be provided by other Divisions. Cutting or coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Architect and Engineer.

N. DEMOLITION

1. Existing equipment, ducts, piping, valves, fittings, devices, etc., requiring removal shall be removed and delivered to the Owner at a location on the job site to be determined by the Owner. Those items determined by the Owner to be of no value shall become the property of the Contractor and shall be removed from the job site by the Contractor at the Contractor's expense.

2. Existing piping, ducts, and services, etc., requiring capping or plugging shall be capped or plugged below floors, behind walls, above ceilings or above roof unless otherwise noted.

O. EXCAVATION AND BACKFILLING

1. Excavation and backfilling for work to be done under this Specification Section shall be done under this Section. All underground lines outside buildings shall be 2'-0" minimum backfill cover unless a greater depth of cover is recommended by the pipe manufacturer for the particular application. Width at top of pipe shall be 16" plus the outside width of pipe. Provide all shoring where required by site conditions.

2. Backfill

    a. 6" Below, Around, and to 12" Above Pipe. Material shall be sand. Place Carefully around and on top of pipe, taking care not to disturb piping, consolidate with vibrator.

    b. One Foot Above Pipe to Grade. Material shall be sandy or silty loam, free of lumps, laid in 6" layers, uniformly mixed to proper moisture and compacted to required density. If backfill is determined to be suitable and required compaction is demonstrated by laboratory test, water compaction in 6" layers may be used, subject to review by Engineer.

3. Compaction. Compact to density of 95% within building and under walkways, driveways, traffic areas, paved areas, etc. and to 90% elsewhere. Demonstrate proper compaction by testing at 8" above top of pipe. Perform test at every 100' of trench. If a test fails, the compaction shall be re-worked in both directions back to test points that passed, before re-testing.

4. Electrical conduit shall not be run in excavations provided for mechanical systems.

5. Excavation and backfilling in a public right-of-way shall be done in strict accordance with the agency having jurisdiction.

P. HANGERS AND SUPPORTS.

1. Provide all hangers, bracing, and supports for the proper installation of equipment and materials under this Section of the Specification.

2. Any structural element required to properly hang or support piping, ducts, or equipment, etc., provided under this Specification Section and not shown on the Architectural or Structural Drawings shall be provided under this Specification Section.

3. All plumbing piping shall be supported and seismically braced in compliance with the details on the plans. All piping and components shall be braced as required to prevent movement and contact with other construction or components.

Q. FLASHING

1. Whenever any part of the Mechanical System(s) must penetrate the roof or outside wall, the openings shall be flashed and counter-flashed absolutely water tight with minimum 22 gauge galvanized sheet metal, prime coated. Flashing aprons shall extend not less than eight inches (8") from the duct, pipe, or supporting member in all directions unless detailed otherwise. All penetrations shall be flashed following the procedures of the National Roofing Contractor's Association

R. PAINTING

1. Paint all black iron supports, hangers, anchors, etc., and all uninsulated black iron pipe work installed in weather exposed locations with one coat of rust resisting primer.

S. CONTINUITY OF SERVICES

1. All existing services and systems shall be maintained except for short intervals when connections are to be made. The contractor shall be responsible for any interruptions of services and shall repair damage done to any existing service caused by the work.

2. If utilities not indicated on the drawings are uncovered during excavation, the Contractor shall notify the architect immediately for further instructions.

T. ELECTRICAL CONNECTIONS

1. Provide under Specification Division 22 00 00 all required control conduit, wiring, controls and control panels as indicated on the drawings or as may be required for system operation.

2. No control device shall be mounted with rigid connections on vibration isolated mechanical equipment. No field furnished control device shall be mounted on any piece of equipment so that it interferes with physical access of air or water flow, or covers any portions of nameplates or access doors.

U. Electrical Coordination

1. Prior to commencing construction arrange a conference with the electrical and mechanical trades as well as equipment suppliers and verify types, sizes, locations, voltage requirements, controls and diagrams of all equipment furnished by them. In writing, inform the Architect that all phases of coordination of this equipment have been covered and if there are any unusual conditions or problems they shall be enumerated at this time.

V. DEFINITIONS

1. Provide. The term "provide" as used in these specifications or on the Drawing shall mean furnish and install.

2. Piping. The term "piping" as used in these Specifications or on the Drawings shall mean all pipe, fittings, nipples, valves, unions, hangers, and thermal insulation, etc., as may be required for a complete and functional system.

3. Wiring. The term "wiring" shall include the provision of all necessary products which are required for a complete installation and shall include products such as conduit, electrical boxes, connections, transformers, relays and switches.

W. PAINTING

1. Paint all black iron supports, hangers, anchors, etc., and all uninsulated black iron pipe work installed in weather exposed locations with one coat of rust resisting primer.

X. ACCESS DOORS AND PANELS

1. Provide access doors as required where equipment, piping, valves, ductwork, etc. are not otherwise accessible. Access doors shall match the wall or ceiling finish and fire rating as indicated on the Architectural drawings or as required to match wall construction. 16-gauge steel frame and 14-gauge steel panel with paintable finish, except in ceramic tile, where panel shall be 16-gauge stainless steel with satin finish. Continuous hinge. Screwdriver latch. Deliver panels to the General Contractor for installation. Provide Zurn Z-1460-4 for square doors and Z-1460-5 for rectangular doors, Karp, or equivalent. Unless otherwise noted, the minimum sizes shall be as follows:

a. 1 valve up to 1-1/2"	12"x12"
b. 1 valve up to 3"	16"x16"
c. Fire damper, VAV box, coil	16"x16"

Y. SYSTEM IDENTIFICATION

1. Above Grade Piping. Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, by stenciled marking or decals, and include arrows to indicated direction of flow. Locate markers at end of lines, near major branches and other interruptions including equipment in the line, where lines pass through floors, walls or ceilings or otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portions of lines. Marking of short branches and repetitive branches of equipment connections are not required. Decals pasted, glued, or adhered to piping or insulation shall be Seton "Setmark", or equivalent. Decals or stencils shall be applied after the painting of all piping systems is complete and after preliminary acceptance of piping system. Decals and stencils shall comply with ANSI and OSHA specifications with respect to marker size, color, and legend.

2. Below Grade Piping. Bury a continuous, pre-printed, bright colored plastic ribbon marker with each underground pipe. Locate directly over buried pipe, 6" to 8" below grade

3. Equipment. All equipment shall be identified with a plastic laminated engraved nameplate which bears the unit number marked as indicated on the drawings (e.g. AC-4, WH-1) Provide 1/2" high lettering - white on black background. Nameplates shall be permanently secured to the unit. Air conditioning equipment shall be identified as to area served.

Z. PROTECTIVE COATING FOR UNDERGROUND PIPING

1. All ferrous pipe below grade (except cast iron) shall have a factory applied protective coating of extruded high density polyethylene, 35 to 70 mils total thickness, such as X-Tru-Coat or Scotchkote. All fittings and areas of damaged coating shall be covered with two layers of double wrap 10 mil polyvinyl tape to total thickness of 40 mils. Johns-Manville. Protective coating shall be extended 6" above surrounding grade.

AA. CONCRETE ANCHORS

1. Steel bolt with expansion anchor requiring a drilled hole - powder driven anchors are not acceptable. Minimum concrete embedment shall be 4½ diameters. Minimum spacing shall be 10 diameters center to center and 5 diameters center to edge of concrete. Maximum capacity shall be determined in compliance with ACI 318-19, Chapter 17 and the anchor’s engineering evaluation report. Hilti, Phillips. Wej-it. Exterior locations shall utilize stainless steel hardware.

BB. PROJECT CLOSE-OUT

1. Record Drawings

    a. Provide in accordance with general conditions of the specifications.

2. Operation and Maintenance Manual for Mechanical Systems

a. Provide three (3) copies of Operation and Maintenance Manuals to the Engineer for review and acceptance. Provide the Owner's designated representative with one copy of the approved O & M manual. Bind Operation and Maintenance Manuals for each Mechanical System (Plumbing, Air Conditioning, etc.) in a hard-backed binder. Cover of each binder shall have the following lettering:

OPERATION
AND
MAINTENANCE
MANUAL
SOUTHERN KERN UNIFIED SCHOOL DISTRICT
ROSAMOND HIGH EARLY COLLEGE CAMPUS
GYMNASIUM REMODEL

Provide a transmittal letter at the beginning of the manual on the Contractor's letterhead. Letter shall be signed by a contractor principal (Owner or Corporate Officer) and shall be countersigned by the Owner's designated representative and shall indicate the date when the mechanical systems were shown and explained in detail to the Owner's designated representative. (The Engineers office shall be notified 48 hours minimum prior to the owner-contractor meeting.)

Provide a master index at the beginning of Manual showing items included. Use plastic tab indexes for the sections of the Manual.

Section 1, General. Provide:

Name of Architect, Mechanical Engineer, Contractor and Mechanical Sub-Contractor.

A complete list of installed equipment with project mark number, indicating name of vendor, address and phone number.

A sub-section with manufacturer's descriptive literature for each item of installed equipment with model, capacities, and all other pertinent information highlighted.

Section 2, Operating instructions. Provide:

General description of each separate system and sub-system.

Step by step procedure to follow in putting each piece of mechanical equipment into operation. Start-up sheets must be signed by the owner of the installing contractor certifying that the start-up has been completed per manufacturer’s written instruction.

Schematic as-built control diagrams for each separate system. Diagrams shall bear the date of the acceptance of the project. Include all temperature control panels and their respective functions.
Section 3, Maintenance Instructions. Provide:

Summary list of mechanical equipment used indicating name, model, serial number, and nameplate date of each item together with number and name associated with each system item.

Manufacturer's maintenance instructions for each piece of mechanical equipment installed in project. Instructions shall include name of vendor, installation instructions, parts numbers and lists, operation instructions of equipment and maintenance and lubrication instructions.

Section 4, Warranties. Provide:

A copy of each manufacturer's warranty statement, completely filled out and indicating date forwarded to the respective manufacturer.

PART 2 MATERIALS

A. PIPING

1. General

   a. All material shall be in conformance with current specifications of American Society of Testing Materials (ASTM) and CPC 301.2.

2. Domestic Cold Water

   a. Inside Building, Above Grade or Slab

      i. Type "L" hard drawn copper tubing with wrought copper solder joint fittings, NIBCO, ANACONDA, or acceptable equivalent. Joints shall be made with 95.5 solder, such as Silavoy Streamline 122, Silvabrite 100 or acceptable "lead free" equivalent. Pipe to be reamed to full bore, de-burred, and joint area cleaned with a Trisodiumphosphate solution prior to joining.

      ii. Where allowed under local and state building codes: Pro-Press pipe joining system for copper piping.

   b. Outside Building, Below Grade, Slab, and Paved Areas.

      i. Schedule 40 galvanized steel with galvanized malleable iron banded 150 lb. fittings. Pipe shall be protected as specified elsewhere in this section.

      ii. Polyvinylchloride (PVC) pressure rated Schedule 40, ASTM D 2241, with rubber rings, ASTM D 1869. Piping shall be equivalent to Johns-Manville "Ring-Tite" and shall be installed in strict compliance with Manufacturer's Installation Guide. Where sizes shown are smaller than those available with “Ring-Tite” pipe, use schedule 80 PVC glued pipe and fittings. Piping option only where local codes allow its use.

iii. Type "K" hard drawn. All else per copper specification above.

3. Domestic Hot Water.

    a. Inside Building, Above grade or slab

        i. Same as Cold Water Piping - Inside Building.

    b. Outside Building, Below Grade, Slab, and Paved Areas.

        i. Pre-insulated, Type K copper core. 1" foamed polyurethane insulation. Polyvinylchloride jacket. Sealed ends. Rubber ring internal slip joint. Fittings shall be wrought copper, with brazed joints (1100°F, min.) Ricwill, Thermal Pipe Systems.

4. Soil Waste and Vent Piping

    a. Inside Building and Within 5 Feet of Building Wall

        i. Coated standard weight cast iron pipe and fittings, CISPI Standard 301 and ASTM A-888. Joints shall be ABI "No-Hub" stainless steel band, mechanically assembled (no welds), conforming to ASTM C564.

        ii. Vent piping and waste piping above floor 2-1/2" diameter maximum may be standard weight galvanized steel pipe.

5. Condensate Drains

    a. Type “L” hard drawn copper tubing with wrought copper solder joint fittings. All changes in direction of condensate drain shall be accomplished with plugged tees. Drains shall be extended as indicated on drawings or to nearest acceptable fixture or vent if not indicated.

6. Gas Piping

    a. Inside Building and Above Grade

        i. 2" and Smaller. Black steel pipe Schedule 40 with 150 psi threaded black malleable fitting. All joints shall be treated with code approved pipe dope. Flexible appliance connectors shall be convoluted stainless steel with dielectric couplings, AGA for indoor and outdoor use. Connector shall be AGA certified laboratory approved for vibration resistance.

        ii. 2½” thru 4”. Same as above except with welded fittings.

        iii. 5” and Larger. Same as above except with standard weight carbon steel weld fittings, long radius ells, ANSI B16.9.

    b. Outside Building Below Grade

i. Black steel pipe Schedule 40 with welded fittings and joints. Protect as specified elsewhere in this section.

ii. Polyethylene pipe and fittings, ANSI B31.8. ASTM D 2513, DuPont Alloy "A" or Nipak

7. Exposed Pipe at Fixtures

a. Chrome plated red brass pipe, iron pipe size, with threaded cast bronze chromium plated couplings and fittings. Any pipe required to extend from finish wall into exposed view within Toilet Rooms shall be chrome plated.

8. Piping Protective Wrap

a. All galvanized or black steel piping buried below grade shall be factory coated with Scotchkote 101 Epoxy Resin as manufactured by 3M Company, or "X-tru-Coat" as manufactured by Pipe Line Service Corp. Field joints shall be wrapped by Scotchrap #50 or coated with Scotchkote 302 as recommended by manufacturer. In lieu of above, pipe may be machine-wrapped with Scotchrap #51. 50% lapped with joints per above.

b. Provide a continuous test of all pipe covering, including field joints, prior to backfilling. This test shall be made using a “Holiday Detector” as manufactured by Tinker and Rascor Co., or approved equal. Test at an electrical voltage of 10,000 volts D.C. Any wrap holiday found shall be patched and retested. This test shall be done in the presence of the owner’s inspector

2. Exposed Pipe at Fixtures

a. Chrome plated red brass pipe, iron pipe size, with threaded cast bronze chromium plated couplings and fittings. Any pipe required to extend from finish wall into exposed view within Toilet Rooms shall be chrome plated.

B. Valves

3. General

a. Manufacturer's model numbers are listed to complete description. Equivalent models of Crane, Grinnell, Nibco, or Stockham are acceptable. Use ball valves for 1-1/2" and smaller domestic hot and cold water, and gate valves for 2" and larger size.

4. Gate Valve

a. 2" and Smaller. All bronze, Malleable iron hand wheel, Rising stem, Union bonnet, Wedge disc, 200 psi WOG, Stockham B-105.

b. 2-1/2" and Larger. Iron body, bronze mounted, Non-rising stem, Wedge disc, 200 psi WOG, Flanged or AWWA hub end as applicable. Stockham G-612.

Underground valves shall have square operating nut. Provide one operating "T" handle for underground valves.

5. Check Valves

    a. 2" and Smaller. All bronze swing check, regrinding. 200 psi WOG. Stockham B-319.

    b. 2-1/2" and Larger. Swing check, iron body, brass mounted seats, Class 125. Stockham G-931.

6. Ball Valve.

    a. Bronze body, cap, stem, disk and ball. Screwed connection. Lever handle TFE seat. O-ring seals. 600 psi WOG. Consolidated Brass “Apollo”, Grinnell,

7. Plug Valves

    a. Lubricated plug cock. Cast iron or semi-steel body and plug. 200 PSI WOG. Flanged. Wrench handle. U.L. listed for gas distribution. Resun R-1430 Walworth 1700 F. Ball valves with U.L. listing for gas distribution and equivalent or higher pressure rating may be substituted for 2" and smaller plug valves. Apollo, Watts.

C. Insulation

1. General

    a. All insulation shall comply with the requirements per the California Building Energy Efficiecny standards, Title 24, current edition. Refer to Table 120.3-A, Pipe Insulation Thickness

    b. All insulation shall be provided in accordance with the "National Insulation Contractors Association" manuals. Insulation shall be applied by a contractor holding a valid California C-2 License.

    c. All insulation jackets and lapseal adhesives shall be tested as a composite product in accordance with ASTM E 84, Class A and shall have a flame spread of not more than 25 and a smoke developed rating of not more than 50.

    d. All domestic hot water piping, fittings and accessories shall be insulated. All circulating piping shall be insulated. Cold water piping in ventilated attic shall be insulated.

2. Interior Piping, Fittings and Valves

a. Shall be insulated with 1" thick Fiberglass ASJ/SSL U.L. rated pipe insulation through 1" diameter pipe, 1-1/2" thick for 1-1/4" diameter pipe and above. Fittings shall be hard molded plastic flush. Do not insulate flanges or valves unless water temperature exceeds 140°F or the piping is exposed to weather.

3. Piping Exposed to Weather or View

a. All piping and fittings exposed to weather shall have, in addition to the above-described insulation, aluminum jacketing. 0.016" thickness for straight pipe. 0.024" thickness for fittings. Integral moisture barrier. Provide pre-fabricated aluminum strapping and seals by same manufacturer, “Childers" or equal. Secure in place with factory supplied straps. Install all joints to prevent water entry. All joints shall be sealed with outdoor mastic. Benjamin Foster 65-07 or equal.

b. For Miscellaneous fittings for which aluminum jackets are not available or where proximity of fittings precludes a neat-appearing installation, the Contractor may cover the insulation with stretchable glass fabric and at least two coats of outdoor mastic.

c. Additional Finish for Exposed Piping and Equipment: All piping and equipment exposed to view but protected from the weather such as in equipment rooms shall be given an additional finish of PVC jackets.

4. Hot Water Supply/Drain Piping and Handicap Fixtures "Handi Lav-Guard" insulating kits by Truebro, Inc. or “Trap Wrap” as manufactured by Brocar Industries. Pre-formed insulation and materials to cover hot water, cold water, and drain piping. Must conform to ADA and California codes. Pressure sensitive expanded poly foam tape will not be accepted.

D. Cleanouts

1. Style shall be ZURN as follows (equivalent models of Smith are acceptable):

a. For vinyl tile use #ZN-1400-6

b. For carpeted areas use #ZN-1400-14

c. For terrazzo areas use #ZN-1400-10

d. For ceramic tile or finished concrete use #ZN-1420-2

e. Grade cleanouts (Non-Traffic areas) use #ZN-1400-25

f. Grade cleanouts (Traffic areas) use #ZN-146-15W/Z-1450-8

g. For wall cleanouts use #ZN-1460-8

2. Cleanout Box.

a. Precast reinforced concrete. Cast iron lid marked for service.

E. Fixtures and Trim

1. General

a. Provide Rough-in for and install all plumbing fixtures shown on drawings. All trim not concealed shall be brass with polished chrome plate finish unless noted otherwise. Waste shall be chrome plated 17 gauge P-trap shall have clean-out and escutcheon at tailpiece. All enameled fixtures to be acid resisting. Standard color is white unless otherwise noted.

b. All drinking water faucet products shall be certified to NSF Standard 61 section 9 Drinking Water Components. The brass casting shall contain no more than two tenths of one percent lead by dry weight.

c. Other brass components which contact water within the faucet shall be from brass which contains no more than three percent lead by dry weight. All faucets exempt from NSF Standard 61 Section 9 shall meet the same lead content criteria.

2. Supplies

a. Standard compression stop, straight pattern, loose key, chromium plated with stuffing box.

b. All exposed fixture supplies to lavatories, sink-sand water closets shall be Brass-Craft "Speedway" flexible supplies with metal compression ring connection at all stops or fittings as designated by part number, and shall have a rigid metal to metal connection to fixture valves. For lavatories & sinks use STR 1715A and for tank-type water closets use STR 1712DL.

3. Air Chambers

a. Zurn Z-1700 "Shoktrol" complete with shut-off valve on branch to air chamber and screwdriver stop stainless steel access panel. Provide where noted on drawings and upstream at every quick-closing manual, solenoid or flush valve. Install per manufacturers instructions locating chamber between the last two fixtures on a 20’ or shorter header, or use (2) chambers (calculated for the total fixture unit count) for headers over 20’ in length with locations in the middle and between the last two fixtures on the header.

F. Backflow Preventers

1. General

a. Backflow preventers shall be provided on building domestic water service as may be required by the local utility and shall also be provided in all branch lines serving any new or existing boiler, cooling tower, evap. condenser or other device requiring chemical water treatment.

2. Reduced Pressure Type: Two spring loaded "Y" pattern check valves, differential relief valve mechanism, inlet and outlet shut-off valves, and four test clocks. Approved by AWWA. Febco, Beeco, or equivalent.

3. Double Check Type: Two spring loaded "Y" pattern check valves, inlet and outlet shut-off valves, and four test clocks. Approved by AWWA. Febco, Beeco, or equivalent.

4. Pressure Type Vacuum Breaker: Spring loaded check valve assembly, air inlet port and poppet, inlet and outlet shut-off valves, and two test cocks. Febco, Beeco or equivalent.

5. Domestic Water Heater Expansion Tank: Provide expansion tank on cold water supply to any water heater if backflow prevention is required at site water connection. “Amtrol” ST series sized per manufacturer’s recommendations.

G. Strainers

1. Threaded strainers are to be of the gasketed capped cover extra heavy iron body type - Similar to Mueller Fig. #11. Provide gate valve and pipe nipple with 3/4" hose connection on each strainer for blow-off.

H. Floor, Ceiling, and Wall Plates

1. Beaton and Cadwell No. 10, steel flange with locking device and polished chromium plated finish. Provide plates on any finished surface through which pipe passes.

I. Insulating Fitting

1. Epco dielectric unions with Epconite insulating gasket selected for applicable duty. Provide wherever pipes of different metals are joined.

J. Pipe Markers

1. One inch (1") high minimum, stenciled letters, located every 6'-0". Markers shall indicate piping service such as domestic cold water supply, etc., and shall have directional flow arrow at each location of stenciled letters. Decals pasted, glued, or adhered to piping or insulation are not acceptable unless decal wraps entirely around pipe or insulation such as Seton "Set mark", or equivalent. Decals shall be applied after painting of all piping systems is complete and after preliminary acceptance of piping system. Decals shall comply with ANSI and OSHA specifications with respect to marker size, color, and legend

K. Union

1. 2" and smaller - AAR malleable iron, bronze to iron ground seat. 30 psi. Size 2-1/2" and larger - Grooved pipe, synthetic gasket, malleable iron housing. Victaulic Style 77, Type "E" gasket, Grinnell.

L. Pipe Hangers and Supports

1. General

    a. All plumbing piping shall be supported and seismically braced in compliance with the OSHPD Pre-Approval No. OPM-0052-13 the "B-Line / Tolco Industries Seismic Restraint System". Copies of the above publication and details shall be provided by the Contractor and maintained at the project site until final acceptance.

2. Steel pipe and Cast Iron Soil Pipe

    a. 1/2" through 4" pipe. Provide B-line B3690 J-style hanger, with standard electro-plated finish.

    b. 5" and larger pipe. B-line B3100 Clevis-Style pipe hanger with standard electro-plated finish.

3. Copper Tubing

    a. Provide B-line B3690F felt-lined hanger for copper tubing with standard electro-plated finish.

4. Insulated Pipe & Tubing

    a. Provide B-line B3380 thru B3384 360° calcium silicate shield. The hanger and shield shall be fitted to the outside of the pipe insulation.

5. Cast Iron Pressure Piping

    a. Provide B-line B3102 Clevis-Type hangers sized for water works piping.

6. Hanger Rod Sizing

    a. Hanger rods shall be roll threaded mild steel with electro-galvanized finish and shall meet or exceed the following table:

Piping or Tubing Size	Hanger Rod Size
1/2" through 2"	3/8"
2-1/2" through 5”	1/2"
6" through 10"	5/8"

7. Hanger Spacing

    a. Provide at least one hanger per branch and independently support all line-mounted equipment. Provide a hanger within 12" of elbow at riser or drop.

Spacing of hangers along the run of the pipe shall not exceed the following table:

Pipe or Tubing Size	Steel Pipe	Copper Tube	CI Pipe
1/2" through 3/4"	7'-0"	5'-0"	5'-0"
1" through 1-1/4"	7'-0"	6'-0"	5'-0"
1-1/2" through larger	10'-0"	10'-0"	5'-0"

8. Structure Attachments

    a. General

        i. Shall be engineered to support the intended design load and shall be sized for the hanger rod specified.

        ii. For attaching to steel channels, use B-line beam clamp threaded anchor hook.

9. Trapeze Hangers

    a. Trapeze hangers shall be fabricated from galvanized channel. Stress on the installed channel shall not exceed 25,000 psi. Deflection on the installed channel shall not be greater than 1/240th of the span length. For load calculations, all piping to be assumed to be water-filled unless handling a heavier liquid. Hanger rods for trapeze hangers shall be limited to 9,000 psi stress based on the area at the root of the threads. Minimum hanger rod size shall be 3/8"

10. Riser Clamps

    a. B-Line B3373 plain finish for interiors, galvanized for exterior. Provide on vertical piping at each floor.

M. Sleeves

1. Non-Rated Assemblies: Sleeves for pipe passing through concrete floors or walls shall be Schedule 40 galvanized steel pipe of size sufficient to permit the pipes to pass through with a minimum clearance of 1/2” between sleeve and pipe. Sleeves shall have square ends cut flush with surface and shall be caulked tight whether pipe is bare or insulated. Sleeves through floors shall extend 1" above finished floor surface.

2. Rated Assemblies

    a. Bare Pipe. Same as for non-rated assemblies except that sleeves shall provide a clearance of 1" between sleeve and pipe. Clearance shall be

packed for its entire length with a UL system 161 three hour classification such as a 3M FireDam 160 caulk at ends and mineral wool batt material stuffer in middle of penetration.

b. Insulated Pipe. Insulation for pipe in sleeve shall consist of a 360 degree water-proofed calcium silicate insert sized to extend a minimum of 1" beyond each end of sleeve. Calcium silicate insert shall be of the same thickness of adjoining insulation. Clearance shall be packed for its entire length with a UL system 161 three hour classification such as a 3M FireDam 160 caulk at ends and mineral wool batt stuffer in middle of penetration.

N. Flashings

1. Vent flashing shall be 4 lb. seamless lead, 16" sq. flange, length sufficient to be turned down 2" into vent. Oatey. Provide 24"x24" 4 lb. lead flashing at each roof drain. Flashing for other piping through roof shall be prefabricated galvanized steel roof-jacks with 16" sq. flange. Provide storm collar and seal water tight with mastic

O. Yard Boxes and Covers

1. One piece precast concrete with cast iron cover labeled "Sewer", "Gas", "Water", etc., as required. Provide traffic weight cover in traffic areas. Provide 6" minimum length "Thinwall" series 2000 6" diameter pipe extension to valves installed deeper than boxes. Install in workman like manner. Multiple boxes located on same centerline parallel to building exterior wall. Provide 6" concrete apron in non-paved areas.

PART 3 EQUIPMENT

A. General Requirements

1. Capacity. Capacities and efficiencies shall be in accordance with schedules shown on drawings. Scheduled numbers are to be considered minimum.

2. Dimensions. Equipment must conform to space requirements and limitations indicated on drawings and as required for operation and maintenance. Equipment that does not readily conform to space conditions is unacceptable. Prepare and submit layout drawings for all proposed equipment substitutes showing actual job conditions, required clearances for proper operation, maintenance, etc.

PART 4 INSTALLATION

A. Equipment Connections

1. Water and drain connections shall be provided for each piece of equipment as required. Provide shut- off valve or fixture stop for each water supply to each piece of equipment whether or not equipment is furnished in this Specification Section.

2. Provide a backflow preventer at each connection to equipment as required by code whether or not equipment is provided in this specification section.

3. Provide a regulating valve at drinking fountain supplies. Valve, supply piping, and electrical connector shall be installed so as not to be visible.

4. Ratings

    a. Gas. Natural gas burning equipment shall be furnished with 100% safety gas shut-off, intermittent pilot ignition, and be approved by AGA.

    b. Electrical. Equipment shall be in accordance with NEMA standards and U.L. listed where applicable standards have been established.

5. Piping.

    a. Each item or assembly of items shall be furnished completely piped for connection to services. Control valves and devices shall be furnished, installed, and wired except where noted by others on drawings.

B. Fixtures

1. Piping beyond finished wall at each fixture shall be chrome plated.

2. All piping supporting flush valves, hose bibbs, etc., shall be securely fastened to the building structure at each device to prevent movement of piping. All supplies to individual and/or adjacent fixtures shall be at same height and on center line of waste insofar as possible. Fixture height shall be as indicated on architectural drawings

3. Wall hung fixtures shall have space between fixture and wall surface caulked with white silicone caulk.

4. Rough-in and connection for trim and other fixtures supplied by others shall be included in this specification section.

5. Where aerators are scheduled for the various fixtures, provide Chicago "Lam-A-Flo" Laminar flow controls.

6. Floor Drains or Floor Sinks shall be placed parallel to room surfaces, set level, flush with floor and adjusted to proper height to drain. Cover openings during construction to keep all foreign matter out of drain line.

C. Piping

1. Constantly coordinate work with that of other trades so as to prevent any interference with this installation.

2. Install cleanouts at ends of sewer lines, at changes of direction greater than 45 degrees, and at not greater than 100 foot intervals. Locate interior cleanouts in accessible locations and bring flush to finished surface.

3. Vents shall terminate not less than 6" above the roof nor less than 12" from any vertical surface nor within 10' of any outside air intake. Install horizontal vent lines at 1/4" per foot pitch. Offset vents 2' minimum from gutters, parapets, ridges and roof flashing.

4. Condensate Drain Piping shall be installed with constant pitch of 1/8" per foot minimum. Provide tee with clean-out plug at all changes of direction. Provide a trap at each air handling unit to prevent air leakage. Connections to equipment mounted on vibration isolators shall be made with flexible connections.

5. Freeze Protection

    a. All piping two inch and smaller located outside building and above ground and where exposed to freezing conditions shall be neatly wrapped with refrigerant insulated tape for freeze protection.

6. Sterilization of Piping

    a. Disinfect all domestic hot and cold water piping systems in accordance with 2022 CPC 609.10, "Disinfecting of Potable Water System". Disinfecting process shall be performed bu contractor and witnessed by a representative of the Engineer. During procedure signs shall be posted at each water outlet stating, "Chlorinating - Do not drink". After disinfecting, water samples shall be collected and sent to an independent lab for bacteriological analysis. Certificate of Bacteriological Purity shall be obtained from lab and delivered to the Owner through the Engineer.

7. Tests and Adjustments

    a. Sanitary Sewer. All ends of the sanitary sewer system shall be capped and lines filled with water to the top of the highest vent, 10' above grade minimum. This test shall be made before any fixtures are installed. Test shall be maintained until all joints have been inspected, but no less than 2 hours. Grade tests will be allowed on “ring-tite” PVC pipe.

    b. Condensate Drain. Similar to Sanitary Sewer.

    c. Domestic Hot and Cold Water Piping: Maintain 100 psig water pressure for 4 hours.

END OF SECTION

SECTION 23 00 00
HEATING, VENTILATING & AIR CONDITIONING

PART 1 – GENERAL

A. GENERAL PROVISIONS

1. General Provisions of the contract including General and Supplementary Conditions apply to the work specified in this Section.

B. SCOPE.

2. Work Included. Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:

a. Air distribution systems.

b. All equipment as shown or noted on the drawings or as specified.

c. System energy balance.

d. Demolition as indicated on drawings or as required to complete new work.

e. HVAC controls. Pelican Wireless is basis of design. See plans.

f. Acceptance testing as required under California Building Energy Efficiency Standards, Title 24.

g. Coordination with commissioning agent.

C. CODES AND STANDARDS

1. All work and materials shall conform with current rules and regulations of applicable codes. Nothing in these Drawings or Specifications is to be construed to permit work not conforming to these codes. Should the Drawings or Specifications call for material or methods of construction of a higher quality or standard than required by these codes, the Drawings and Specifications shall govern.

a. Applicable codes and standards shall include but are not necessarily limited to:

i. <u>California Code Of Regulations:</u>

1. Title 8, Industrial Relations

2. Title 17, Public Health

3. Title 19, Public Safety

4. Title 21, Public Works

5. Title 24, Energy Regulations

ii. California Building Code.

iii. California Mechanical Code

iv. California Plumbing Code

v. Local Codes and Ordinances

vi. Air Moving and Conditioning Association (AMCA)

vii. American National Standards Institute (ANSI)

viii. Air Conditioning and Refrigeration Institute (ARI)

ix. American Society of Heating, Refrigerating, and Air Conditioning Engineers

x. American Society of Mechanical Engineers (ASME)

xi. American Society for Testing and Materials (ASTM)

xii. American Water Works Association (AWWA)

xiii. California Electrical Code (CEC)

xiv. National Electrical Manufacturers Association (NEMA)

xv. National Fire Protection Association (NFPA)

xvi. Occupational Safety and Health Act (OSHA)

xvii. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

xviii. Americans with Disabilities Act. Accessibility Guidelines for Buildings and Facilities. (ADAAG).

D. PERMITS AND FEES

1. The Contractor shall take out all permits and arrange for all tests in connection with such work as required. All charges are to be included in the work. All charges or fees for service connections, meters, etc., shall be included in the work.

E. COORDINATION OF WORK

1. Before starting any work, thoroughly examine all existing and newly completed underlying and adjoining work and conditions upon which the installation of this work is in any way dependent for the workmanship required by the Contract Documents. Report to the Architect and Engineer in writing any and all conditions which might adversely affect this work and limit ability to perform the required workmanship.

2. Layout of materials, equipment and systems is generally diagrammatic unless specifically dimensioned. The actual locations of all materials, piping, ductwork, fixtures, equipment, supports, etc., shall be carefully planned, prior to installation of any work, to avoid all interference's with each other, or with structural, electrical or architectural elements. Verify the proper voltage and phase of all equipment with the electrical plans. All conflicts shall be called to the attention of the Engineer prior to the installation of any work or the ordering of any equipment.

3. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings, and accessories that may be required. Carefully investigate the mechanical, electrical, structural, architectural drawings and field conditions that could affect the work to be performed and arrange such work accordingly. Provide the required piping and ductwork offsets, fittings, and accessories to meet such conditions.

4. Spaces provided in the design of the building shall be utilized and the work shall be kept within walls or furring lines established on the drawings. Any discrepancy between Architectural or Mechanical drawings with respect to wall or furring locations and dimensions shall be brought to the Architect's attention for resolution before proceeding with installation.

5. Any work which is done as an addition, expansion, or remodel of and existing system shall be compatible with that system.

F. MANUFACTURER'S RECOMMENDATIONS

1. All material, equipment, and devices, etc., shall be installed in a manner meeting approval of the manufacturer of the particular item. The Contractor shall make himself available of all installation manuals, brochures, and procedures that the manufacturer issues for the equipment and material. Contractor shall be held responsible for all installations contrary to the manufacturer's recommendations. Contractor shall make all necessary changes and revisions to achieve such compliance.

G. GUARANTEE

1. Guarantee shall be in accordance with the General Conditions. These Specifications may extend the period of the guarantee for certain items. Where such extensions are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the certificate of guarantee shall be furnished to the Owner.

H. QUIETNESS

1. Piping of all types, ductwork, and equipment shall be arranged and supported so that the vibration is at a minimum and is not transmitted to the building structure.

I. DAMAGES BY LEAKS

1. The Contractor shall be responsible for damages caused by leaks in the temporary or permanent piping or mechanical systems prior to completion of work and during the period of the guarantee.

J. SUBMITTALS

1. Shop Drawings. Within 30 days of contract award, the Contractor shall submit six copies of shop drawings for all materials, equipment, etc., proposed for use on this project. Material or equipment shall not be ordered or installed until written review is processed by the Engineer. Any item omitted from the submittal shall be provided as specified without substitution. All shop drawings must comply with the following:

    a. Shop drawings are required for all material and equipment items and shall include manufacturer's name and catalog numbers, dimensions, capacities, performance curves, and all other characteristics and accessories as listed in the contract documents. Descriptive literature shall be current manufacturer's brochures and submittal sheets.

    b. All shop drawings shall be submitted at one time in a three hole binder with title sheet including Project Title, Architect, Engineer, Contractor, table of contents, and indexed tabs dividing each group of materials or item of equipment. All items shall be identified by the specification paragraph number for which the are proposed. All equipment shall also be identified by the mark number as indicated on drawings. Submittals shall bear the stamp of certification by the Contractor as evidence that the Contract Documents (Specifications and Drawings) have been thoroughly checked.

    c. All capacities, characteristics, and accessories called for in the specifications or on the drawings shall be high-lighted, circled or underlined on the shop drawings. Data must be complete enough to permit detailed comparison of every significant characteristic which is specified, scheduled or detailed.

2. Review. Submittals will be reviewed for general conformance with the design concept, but this review does not guarantee quantity shown, nor does it supersede the responsibility of the Contractor to provide all materials, equipment and installation in accordance with the drawings and specifications. The Contractor shall agree that shop drawing submittals processed by the Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.

a. If deviations, discrepancies or conflicts between shop drawings and design drawings and specifications are discovered either prior to or after shop drawing submittals are processed by the Engineer, the design drawings and specifications shall control and shall be followed. Submittals for products and equipment offered as an alternate to that specified will require, if accepted by the Engineer, resubmission of the Title 24 Energy Compliance Calculations if the specified product or equipment was included within the scope of the approved calculations on file with the reviewing authority. The cost of preparing resubmission will be the responsibility of the Contractor.

K. OPENINGS, CUTTING AND PATCHING

1. The locations and dimensions for openings through walls, floors, ceilings, foundations, footings, etc. required to accomplish the work under this Specification Division shall be provided under this Division. Except as noted below, the actual openings and the required cutting and patching shall be provided by other Divisions. Coring through existing concrete or masonry walls, floors or asphaltic concrete required to accomplish the work under this Specification Division shall be provided under this Division. Restoration of all surfaces shall be provided by other Divisions. Cutting or coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Architect and Engineer.

L. DEMOLITION

1. Existing equipment, ducts, piping, valves, fittings, devices, etc., requiring removal shall be removed and delivered to the Owner at a location on the job site to be determined by the Owner. Those items determined by the Owner to be of no value shall become the property of the Contractor and shall be removed from the job site by the Contractor at the Contractor's expense.

2. Existing piping, ducts, and services, etc., requiring capping or plugging shall be capped or plugged below floors, behind walls, above ceilings or above roof unless otherwise noted.

M. HANGERS AND SUPPORTS.

1. Provide all hangers, bracing, and supports for the proper installation of equipment and materials under this Section of the Specification.

2. Any structural element required to properly hang or support piping, ducts, or equipment, etc., provided under this Specification Section and not shown on the Architectural or Structural Drawings shall be provided under this Specification Section.

3. All ducts and mechanical piping shall be supported and seismically braced in compliance with the details on the plans. All piping and components shall be braced as required to prevent movement and contact with other construction or components.

N. CONTINUITY OF SERVICES

1. All existing services and systems shall be maintained except for short intervals when connections are to be made. The contractor shall be responsible for any interruptions of services and shall repair damage done to any existing service caused by the work.

2. If utilities not indicated on the drawings are uncovered during excavation, the Contractor shall notify the architect immediately for further instructions.

O. ELECTRICAL CONNECTIONS

1. Provide under Specification Division 23 00 00 all required control conduit, wiring, controls and control panels as indicated on the drawings or as may be required for system operation.

2. No control device shall be mounted with rigid connections on vibration isolated mechanical equipment. No field furnished control device shall be mounted on any piece of equipment so that it interferes with physical access of air or water flow, or covers any portions of nameplates or access doors.

3. Starters.

    a. Magnetic motor starters for all equipment shall be furnished under this Specification for installation under Specification Division 26 00 00, except those shown to be in a motor control center on the Electrical Drawings and those located in factory assembled units.

    b. Starters shall be of the appropriate horsepower and voltage, equipped with the proper NEMA enclosures for indoor and NEMA 3R enclosures for outdoor, with thermal overloads, necessary auxiliary contacts, and ambient compensated overloads, one in each leg.

    c. A circuit breaker shall be mounted in a common enclosure unless the starter is not mounted within sight of the motor, in which case the disconnecting means shall be a separate device provided under Specification Division 16000, Electrical. Mounted in the starter cover shall be "hand-off-automatic" and "reset" control devices. Magnetic switches shall be of pivoted armature design. Starters shall have auxiliary contacts as required by the control system.

4. Motors.

    a. Shall be selected for quiet operation, voltage, and rpm to match the project electrical characteristics. Motors shall be open, drip-proof, normal torque and weatherproofed where indicated or required. Motors shall be of the NEMA premium efficiency type.

5. Electrical Coordination

    a. Prior to commencing construction arrange a conference with the electrical and mechanical trades as well as equipment suppliers and verify types, sizes, locations, voltage requirements, controls and diagrams of all equipment furnished by them. In writing, inform the Architect that all phases of coordination of this equipment have been covered and if there are any unusual conditions or problems they shall be enumerated at this time.

P. FLASHING

1. Whenever any part of the Mechanical System(s) must penetrate the roof or outside wall, the openings shall be flashed and counter-flashed absolutely water tight with minimum 22 gauge galvanized sheet metal, prime coated. Flashing aprons shall extend not less than eight inches (8") from the duct, pipe, or supporting member in all directions unless detailed otherwise. All penetrations shall be flashed following the procedures of the National Roofing Contractor's Association

Q. PAINTING

1. Paint all black iron supports, hangers, anchors, etc., and all uninsulated black iron pipe work installed in weather exposed locations with one coat of rust resisting primer.

R. ACCESS DOORS AND PANELS

1. Provide access doors as required where equipment, piping, valves, ductwork, etc. are not otherwise accessible. Access doors shall match the wall or ceiling finish and fire rating as indicated on the Architectural drawings or as required to match wall construction. 16-gauge steel frame and 14-gauge steel panel with paintable finish, except in ceramic tile, where panel shall be 16-gauge stainless steel with satin finish. Continuous hinge. Screwdriver latch. Deliver panels to the General Contractor for installation. Provide Zurn Z-1460-4 for square doors and Z-1460-5 for rectangular doors, Karp, or equivalent. Unless otherwise noted , the minimum sizes shall be as follows:

    a. 1 valve up to 1-1/2" 12"x12"

    b. 1 valve up to 3" 16"x16"

    c. Fire damper, VAV box, coil 24"x24"

S. SYSTEM IDENTIFICATION

1. Above Grade Piping. Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, by stenciled marking or decals, and include arrows to indicated direction of flow. Locate markers at end of lines, near major branches and other interruptions including equipment in the line, where lines pass through floors, walls or ceilings or otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portions of lines. Marking of short branches and repetitive branches of equipment connections are not required. Decals pasted, glued, or adhered to piping or insulation shall be Seton "Setmark", or equivalent. Decals or stencils shall be applied after the painting of all piping systems is complete and after preliminary acceptance of piping system. Decals and stencils shall comply with ANSI and OSHA specifications with respect to marker size, color, and legend.

2. Equipment. All equipment shall be identified with a plastic laminated engraved nameplate which bears the unit number marked as indicated on the drawings (e.g. AC-4, WH-1) Provide 1/2" high lettering - white on black background. Nameplates shall be permanently secured to the unit.

3. Below Grade Piping

    a. Bury a continuous, pre-printed, bright colored plastic ribbon marker with each underground pipe. Locate directly over buried pipe, 6" to 8" below grade

4. Valves

    a. Provide brass valve tags on all valves of each piping system, including check valves, valves within equipment, faucets, stops and shut-off valves at fixtures and other repetitive terminal units. Prepare and submit for review and acceptance by the Engineer a tagged-valve schedule, listing each valve by tag number, location and piping service. Mount in plastic faced frame where directed by Architect.

T. PROTECTIVE COATING FOR UNDERGROUND PIPING

1. All ferrous pipe below grade (except cast iron) shall have a factory applied protective coating of extruded high density polyethylene, 35 to 70 mils total thickness, such as X-Tru-Coat or Scotchkote. All fittings and areas of damaged coating shall be covered with two layers of double wrap 10 mil polyvinyl tape to total thickness of 40 mils. Johns-Manville. Protective coating shall be extended 6" above surrounding grade.

U. CONCRETE ANCHORS

1. Steel bolt with expansion anchor requiring a drilled hole - powder driven anchors are not acceptable. Minimum concrete embedment shall be 4½ diameters. Minimum spacing shall be 10 diameters center to center and 5 diameters center to edge of concrete. Maximum capacity shall be determined in compliance with ACI 318-19, Chapter 17 and the anchor’s engineering evaluation report. Hilti, Phillips. Wej-it. Exterior locations shall utilize stainless steel hardware.

V. DEFINITIONS

1. Provide. The term "provide" as used in these specifications or on the Drawing shall mean furnish and install.

2. Piping. The term "piping" as used in these Specifications or on the Drawings shall mean all pipe, fittings, nipples, valves, unions, hangers, and thermal insulation, etc., as may be required for a complete and functional system.

3. Ductwork. The terms "duct" or "ductwork" as used in these Specifications or on the drawings shall mean all ducts, fittings, joints, dampers, hangers, and thermal insulation, etc., and other devices as may be required to make a complete and functional system.

4. Wiring. The term "wiring" shall include the provision of all necessary products which are required for a complete installation and shall include products such as conduit, electrical boxes, connections, transformers, relays and switches.

W. PROJECT CLOSE-OUT

1. Record Drawings

   a. Provide in accordance with general conditions of the specifications.

2. Operation and Maintenance Manual for Mechanical Systems

   a. Provide three (3) copies of Operation and Maintenance Manuals to the Engineer for review and acceptance. Provide the Owner's designated representative with one copy of the approved O & M manual. Bind Operation and Maintenance Manuals for each Mechanical System (Plumbing, Air Conditioning, etc.) in a hard-backed binder. Cover of each binder shall have the following lettering:

OPERATION
AND
MAINTENANCE
MANUAL
SOUTHERN KERN UNIFIED SCHOOL DISTRICT
ROSAMOND HIGH EARLY COLLEGE CAMPUS
GYMNASIUM REMODEL

Provide a transmittal letter at the beginning of the manual on the Contractor's letterhead. Letter shall be signed by a contractor principal (Owner or Corporate Officer) and shall be countersigned by the Owner's designated representative and shall indicate the date when the mechanical systems were shown and explained in detail to the Owner's designated representative. (The Engineers office shall be notified 48 hours minimum prior to the owner-contractor meeting.)

Provide a master index at the beginning of Manual showing items included. Use plastic tab indexes for the sections of the Manual.

Section 1, General. Provide:

Name of Architect, Mechanical Engineer, Contractor and Mechanical Sub-Contractor.

A complete list of installed equipment with project mark number, indicating name of vendor, address and phone number.

A sub-section with manufacturer's descriptive literature for each item of installed equipment with model, capacities, and all other pertinent information highlighted.

Section 2, Operating instructions. Provide:

General description of each separate system and sub-system.

Step by step procedure to follow in putting each piece of mechanical equipment into operation. Start-up sheets must be signed by the owner of the installing contractor certifying that the start-up has been completed per manufacturer’s written instruction.

Schematic as-built control diagrams for each separate system. Diagrams shall bear the date of the acceptance of the project. Include all temperature control panels and their respective functions.

Section 3, Maintenance Instructions. Provide:

Summary list of mechanical equipment used indicating name, model, serial number, and nameplate date of each item together with number and name associated with each system item.

Manufacturer's maintenance instructions for each piece of mechanical equipment installed in project. Instructions shall include name of vendor, installation instructions, parts numbers and lists, operation instructions of equipment and maintenance and lubrication instructions.

Section 4, Air Conditioning System Balance and Test Run Reports. Provide:

One-half size reproduction of air conditioning plans annotated to match tabulated measurements.

Tabulated and summarized measurements.

Section 5, Warranties. Provide:

A copy of each manufacturer's warranty statement, completely filled out and indicating date forwarded to the respective manufacturer.

PART 2 - MATERIALS.

A. Ductwork.

1. General.

    a. Construct ductwork to meet all functional criteria defined in section VII, of the SMACNA “HVAC Duct Construction Standards Metal and Flexible”. This shall subsequently be referred to as the SMACNA manual.

    b. Interior ducts shall be constructed with G-60 or better galvanized steel (ASTM 527) LFQ, chem treat. Exterior ductwork or any duct exposed to high humidity conditions (i.e. dishwasher exhaust) shall be G-90 or better.

    c. Support, access doors not part of ducts, bar or angle reinforcing damper rods and items made of uncoated mild steel shall be painted with two coats of two coats primer or provide galvanized equivalent.

2. Rectangular Ducts.

    a. Construct ductwork and supports to meet all functional criteria defined in section VII, of the SMACNA “HVAC Duct Construction Standards Metal and Flexible” 2005 Edition. Hanger spacing shall not exceed 8’.

3. Ells. Rectangular ells of ninety degrees shall be mitered and fitted with AERO/DYNE, "HEP" or equivalent, adjustable turning vane of airfoil contour design. Side rails shall be installed so that vane at heel of elbow shall fit snugly without air passing on the back side. Spacing of vanes according to manufacturers recommendations.

4. Round Ducts.

    a. Galvanized.

        i. Spiral lockseam with standing rib duct. For round ducts, 8" diameter or less, provide Noll or Young and company snap-lock galvanized steel.

        ii. Round elbows shall be pleated or welded gore (5 piece ells). Non-welded gore elbows for use with snap lock ducts shall be taped at gore intersections.

5. Duct Joints.

    a. Rectangular. All ducts shall utilize “Ductmate 25/35” factory fabricated duct joint connectors with #440 gasket tape. Flanged interior gaskets shall be Ductmate #440 or Butyl Rubber Gasket which meets Mil-C 18969B, Type II Class B, and TTS-S-001657 must also pass UL-723. The material must not contain any vehicle that will support fungal or bacterial growth. Formed on flanges shall not be accepted for any duct exceeding 42” in width or any duct subjected to greater than 2” W.G..

b. Round. All round ducts shall utilize male-female slip joints with minimum three (3) sheet metal screws. 0-20” ducts shall utilize sealing compound applied continuously around joint before assembling and after fastening. Wrap joints with 3” wide duct tape. 21” – 72” ducts, use 3-piece, gasketed, flanged joints consisting of two internal flanges (with integral mastic sealant), and one external closure band. Ductmate Spiralmate or equal.

6. Sealing.

   a. Interior to Building - Hardcast fiber tape and liquid adhesive. DT-5300 or DT-540 tape. FTA-20 adhesive. Ductmate PROseal.

   b. Exterior to Building - For joints exposed to weather, sealant shall be G.E. silicone. For joints not exposed to weather, sealant shall be Eco-Duct Seal 44-60, or United Sheet Metal.

   c. Exposed Ducts. All joints shall use Hardcast Galva-Grip or equivalent. Joint shall be finished clean from outward appearance.

7. Flexible Insulated Ducts.

   a. Shall be J.P. Lamborn Company Type AMF or Thermoflex M-KE acoustical low pressure duct. Duct shall be listed and labeled UL-181 Air Duct; meet NFPA-HUD minimum standards and comply with UMC 6. Duct factory R-value 4.2 minimum. In un-conditioned spaces, R-8 minimum.

   b. Hangers shall consist of minimum 3" wide 28 gauge galvanized steel and shall be spaced a maximum of 36" on center. Flexible duct shall be installed in compliance with the manufacturer's latest installation instructions. No kinks or sharp bends allowed. Turning radius shall be a minimum of 1.5 times diameter of duct. A copy of which shall be at the site during and after installation. Provide a minimum of at least one hanger per duct section.

   c. Connections to round ducts or collars shall be made with galvanized or stainless steel worm clamps or "Panduit" adjustable clamps listed by UL-181.

   d. Unless indicated otherwise on the drawings, flexible duct shall be limited to the final 5 foot portion of the duct system connecting to the supply diffuser or return grille. Flex duct shall be limited to factory cut pieces with factory applied end connections.

8. Fire Dampers.

   a. Fire damper assembly shall bear the U.L. 555 Label and the California State Fire Marshall listing number. Provide duct access door to fire damper as required by job conditions in compliance with Title 24, California Mechanical Code. Fire dampers shall be installed in all rated walls and ceilings penetrated by ducts, grilles and diffusers. Fire damper shall have rating equivalent to construction. Dampers shall be installed in strict compliance with manufacturer's installation instructions.

9. Fire/Smoke Dampers.

    a. Damper Assembly shall bear the U.L. 555S Label and State Fire Marshall listing number. Provide access door to smoke damper as required by job conditions in compliance with Title 24, California Mechanical Code. Means of disconnect shall be provided between detector and damper(s), where detector is included as factory mounted and wired. Dampers shall meet most current standard for UL testing. UL555 and UL555S. Dampers shall be suitable for a dynamic system. See details on plans for leakage and velocity requirements. If not listed on plans, provide leakage class I and velocity level at 3,000 FPM.

10. Volume Dampers.

    a. Branch Duct Volume Damper - Volume control damper (VCD) in square or rectangular ducts shall be as follows: Opposed blade, 6" maximum blade width, 16- gauge blade, 48" maximum length, nylon or oil impregnated bronze bearings, 1/2" diameter pin shaft, 16-gauge channel frame, actuating rod out of air stream. VCD in round duct shall be as follows: Damper blade full height of branch and 1" less than branch width. All branch dampers shall have regulator with spring loaded shaft nut and serrated self-locking die cast core. Ventlok 640. Provide remote ceiling operator with chrome plated or painted cover where shown on drawings or where damper control is otherwise inaccessible.

11. Back-draft Dampers.

    a. Unless otherwise noted on drawings: .025 aluminum counter-balanced blades with felt strip on mating edges, and machined brass mounted in six gauge steel channel frame, Pacific Model PRO 1100AI or equal. Normally closed back-draft dampers are required at all roof exhaust fans and all outside air intakes.

12. Bellows Duct Connections.

    a. U.L. Listed neoprene coated 30 ounce fiberglass cloth. 3" metal, 3-1/4" fabric, 3" metal. Ventglass, Dura-Dyne. Ductmate PROflex. Connectors with single fold seams will not be accepted.

13. Duct Fire Caulking.

    a. All ductwork passing through rated assemblies that do not have a fire or fire/smoke damper shall be installed with a U.L. listed fire caulking assembly. Exact details of U.L. listed assembly shall be followed. Provide inspector of record and project engineer submittal showing U.L. listed fire caulking detail that the contractor intends to use for each condition. In lieu of fire caulking, at contractors option, provide fire damper installed in accordance with U.L. listing.

14. Filters.

    a. Pre-Filters.

        i. Minimum of MERV 13 filter, consisting of a nominal 2" thick, pleated type, panel filter, CSFM listed. Initial resistance at 500 feet per minute face velocity shall not exceed 0.30" w.g. Provide one complete change of all filters after air balance is completed and prior to final acceptance.

B. Piping.

15. Refrigerant Piping.

    a. General. Copper Type "L", hard drawn, ASTM B88 with wrought copper fittings, silver alloy brazed 1100°F., joints, Sil-Fos or equal. Size 3/8" O.D. and smaller to be refrigerant tube ASTM B 280. All elbows to have long radius.

C. Inulation.

1. All insulation shall be instrict compliance with California Building Energy Efficiency Standards, Current Edition, Title 24.

2. Refer to table 120.3-A for pipe insulation thickness required. This shall be a minimum. If construction documents call for a higher rating, the higher rating shall apply.

3. Insulation shall have a flame spread of not more than 25 and a smoke developed rating of not more than 50.

4. Ducts.

    a. General. All supply, return, exhaust ducts and plenums shall be insulated externally and/or lined internally as specified herein or as indicated on the drawings. Ducts in directly or indirectly conditioned spaces shall be insulated to aminimum level of R4.2 Ductwork in unconditioned spaces such as an attic where the roof insulation is at the ceiling level or where located outdoors shall have an insulation level of R8 minimum.

    b. Ducts in Attics. All supply and return ducts shall be insulated externally with 2" thick fiberglass 3/4# density. Where rectangular ducts are lined internally, they shall be wrapped on the exterior with 1" thick fiberglass, 3/4# minimum density.

    c. Exposed Ducts Within Conditioned Spaces. Shall not require external insulation unless noted on the drawings.

d. Ducts Exposed to Weather All supply and return ducts shall be lined internally with 2" thick Manville “Permacote Linacoustic” glass fiber and thermosetting resin duct liner, R-8. Provide with antimicrobial edge coating, Johns Manville Superseal Edge Treatment or Superseal HV. Coating edges with adhesive is not acceptable. All field cut edges must be coated prior to delivering duct to job site. Any lined duct left untreated that has been subjected to dirt and / or dust will be rejected, and will not be accepted for installation. Edges must be treated so that complete coverage is obtained, with no raw edges. Apply as directed by manufacturer’s literature.

e. Interior Duct Surfaces. All supply, return. or exhaust duct connections to air conditioning units or fans shall be internally lined for a minimum distance of ten lineal feet upstream and downstream of fan unless otherwise indicated on the drawings. Interior duct liner where applied for attenuation purposes only shall be 1" thick Manville “Permacote Linacoustic” glass fiber and thermosetting resin duct liner, R-4.2. Provide with antimicrobial edge coating. See paragraph above.

f. Duct Wrap. Shall be tightly wrapped around ducts to prevent sagging with longitudinal and transverse lap of at least 6". Laps shall be wired or stapled to eliminate gaps. Insulation shall be secured by wrapping with 18 gauge galvanized wire 12 o.c. adhesive. Insulation shall be applied with density identification exposed.

g. Duct Liner Shall be adhered to clean metal with minimum 100% coverage of adhesive such as 3M Adhesive #38, additionally secured with approved mechanical clips or welded pins per SMACNA standards. Provide with antimicrobial edge coating. Apply per paragraph 2 d) above. Coating edges with adhesive is not acceptable.

5. Refrigerant. Cover piping with foamed plastic insulation. Longitudinal and end seams shall be thoroughly cemented with adhesive in accordance with manufacturer's recommendations. Cover all fittings, unions, valves and connections. Piping exposed to weather shall be covered with .016” thick banded aluminum jacketing. Silicon caulk all joints and seams.

PART 3- EQUIPMENT.

A. General Requirements

1. Start-up. All equipment shall be started and tested in strict accordance with the manufacturer’s written instructions. Provide the inspector of record factory start-up literature for each mechanical item. Demonstrate to inspector that strict compliance to the start-up procedure has been completed for each item. Start-up sheets must be completed and turned in with the O&M manuals. Start-up sheets must be signed by the owner of the installing contractor certifying that the start-up has been completed per manufacturer’s written instruction.

2. Acceptance Testing. Complete acceptance testing of all systems and equipment as required under the Building Energy Efficiency Standards, 2013 Edition, Title 24. Submit all completed and signed forms to the building department or the Division of the State Architect, where applicable.

3. Capacity. Capacities shall be in accordance with schedules shown on drawings. Capacities are to be considered minimum.

4. Dimensions. Equipment must conform to space requirements and limitations as indicated on drawings and as required for operation and maintenance. Where architectural screening is indicated, equipment shall not extend above or beyond screening. Equipment is not acceptable that does not readily conform with the space conditions. Prepare and submit layout drawings for all proposed equipment (different than scheduled units) showing actual job conditions, required clearances for proper operation, maintenance, etc.

5. Ratings.

    a. Gas. Natural gas burning equipment shall be furnished with 100% safety gas shut-off, intermittent pilot ignition, and be approved by AGA.

    b. Electrical. Electrical equipment shall be in accordance with NEMA Standards and UL listed where applicable standards have been established.

6. Piping. Each item or assembly of items shall be furnished completely piped for connection to services. Control valves and devices shall be provided. Equipment requiring domestic water for none-potable use shall be provided with backflow preventer acceptable for intended use by local governing authorities.

7. Electrical.

    a. General. Each item or assembly of items shall be furnished completely wired to individual terminal blocks for connection to single branch electrical circuit. All electrical accessories and controls required by equipment shall be provided. Provide terminal blocks for controls and interlocks not included in equipment package.

    b. Wiring. Conductors, conduit, and wiring shall be in accordance with Electrical Specifications. Individual items within assembly shall be separately protected with dead front, fused disconnect, fuse block, or circuit breaker for each underground conductor. Switches, contacts and other devices shall be in undergrounded conductors.

    c. Motors. Shall be rated, constructed and applied in accordance with NEMA and ANSI Standards without using service factor. Single-phase motor shall be of type to suit application. Three- phase motors shall be of type to suit application. Three-phase motors shall be open drip proof, NEMA B design on pumps and fans, NEMA C on reciprocating equipment, sealed ball bearing, three-phase indication. Insulation shall be double dip and bake with Class F thermal polyester non-hygroscopic epoxy base insulating materials. Design shall limit starting inrush current and running current to values shown on

drawings. Motors exposed to weather shall be open drip-proof approved by manufacturer for this type of service. All motors 1 horsepower and larger shall be the high efficiency type with efficiency and power factor equal or exceeding Century E-Plus.

8. Fan Selection.

    a. Fan Curves. Performance curves shall be submitted for all units of 3000 CFM or greater. Operating point for forward curved fans shall be from point of maximum efficiency toward increased CFM limited by horsepower scheduled. Operating point for backward inclined fans shall be selected near point of maximum efficiency. Curves shall plot CFM verses static pressure with constant brake horsepower, RPM and efficiency lines.

    b. Static Pressure. Unless otherwise noted, pressure scheduled as external static pressure (ESP) includes all ductwork and accessory losses external to the unit housing. Unless otherwise noted, pressure scheduled as total static pressure includes all ductwork, filter, coil, cabinet, damper and other accessory losses. Unless otherwise noted, pressure scheduled as duct static pressure includes all supply and return ductwork and accessory losses external to the unit housing and plenum (as applicable). The allowance for filter losses is 0.3" WC, unless otherwise noted. Submit itemized static pressure losses for all components.

9. Screens. All duct or louver openings to the outside shall be covered with 1/4" galvanized screen.

10. Mixing Dampers. Opposed blade, 16-gauge. Six-inch maximum blade width, 48" maximum length. Nylon or oil impregnated bronze bearings. One-half inch diameter pin shaft. 16-gauge channel frame. One percent maximum leakage at 4" WC in accordance with AMCA 500 for outside air dampers. Actuating rod out of air stream.

11. Coils:

    a. Construction: Copper tube. Copper or aluminum 0.0075" min. thickness fins hydraulically or mechanically bonded to tube. 16-gauge galvanized steel rigid channel coil casing. Rated working pressure 200 psig minimum.

    b. Capacity: Ratings certified by ARI in accordance with ARI standard 410. Cooling Coil face velocity shall not exceed manufacturer's published ratings or 550 fpm. Include coil selection calculations (including expansion valve selection) in shop drawings.

    c. Hot Water Coils: Copper or cast iron headers, brazed or spun to tube. Tube wall minimum thickness 0.024". 10 fins per inch maximum. Minimum 2-row coils, regardless of scheduled capacity.

    d. Direct Expansion Coils: Copper suction header silver brazed tubes, distributing tubes and expansion valve. Working pressure 250 psig minimum. 10 fins per inch maximum.

B. Air Handlers

1. See Equipment Schedule on plans.

PART 4 - INSTALLATION

A. Ductwork.

1. Installation shall conform with NFPA 90A and SMACNA Low Pressure Duct Construction Standards 2005 Edition. Provide mounting and supporting of Ductwork and accessories including, but not limited to, structural supports, hangers, vibration isolators, stands, clamps and brackets, access doors, and dampers. Install ductwork accessories as indicated in accordance with the manufacturer's printed instruction. Allow clearance for inspection, repair, replacement, and service. Ductwork and accessories shall be installed in a manner to prevent vibration and rattling.

2. Deflectors. Provide in rectangular elbows, duct mounted supply outlets, take-off or extension collars to supply outlets, and tap-in branch take-off connections. 45 degree take-off is an acceptable alternative for low velocity systems (below 1,500 FPM).

3. Grilles. Each air inlet and outlet shall be flush with finished surface of wall or ceiling and shall be securely attached thereto. Provide plaster grounds at locations of all wall and hard surfaced ceiling grilles.

4. Branch Take-Offs. All branch ducts from main supply air and to return air trunk duct shall be provided with splitter blade full height of branch take-off and 1" less than branch width. Regulators to be Young or equal. Dampers located in inaccessible areas shall have extended shafts with concealed regulator in adjacent ceiling or wall.

5. Dampers. Install volume control damper and damper regulator on all branch ducts.

6. Flexible Glass Fiber Duct. The use of flexible duct is limited to the last 5 feet of each branch duct (i.e. one 5 foot section of flexible duct may used to connect the grille to the sheet metal branch duct). No joints permitted in 5' length. Joints shall be installed with metal bands and fiber tape and adhesive. Minimum turn radius shall be in accordance with SMACNA Standards (turn radius of duct centerline not less than 1.5 times the duct diameter).

B. Piping.

1. General. Piping Layout:

a. Piping shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location to be approved by Engineer. (No structural member shall be weakened by cutting, notching, boring or otherwise, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed.) All piping shall be installed in a manner to ensure unrestricted flow, eliminate air pockets, prevent any unusual noise, and permit complete drainage of the system. All piping shall be installed

to permit expansion and contraction without strain on piping or equipment. Vertical lines shall be installed to allow for building settlement without damage to piping. Pipe sizes indicated on the drawings are nominal sizes unless otherwise noted.

2. Hangers. Support at intervals with hangers as specified elsewhere within these Specifications or as indicated on the Drawings. No piping shall be in contact with any part of the building structure including sub-assemblies.

3. Obstructions. Piping shall be installed to clear beams, etc., unless sleeving is particularly indicated. Constantly coordinate work with that of other trades so as to prevent any interference with this installation.

4. Refrigerant Piping.

    a. Pipe shall be cut square. Joint surfaces shall be thoroughly cleaned, fitted and erected before brazing. After installation, evacuate to 29 inches of mercury, ambient temperature during evacuation, fill with dry nitrogen to 250 psi and maintain for two-hour period without additional charge. After nitrogen test, purge with refrigerant charged through dryer and maintain holding charge in system and equipment.

C. Insulation.

1. See materials section of this specification for installation requirements.

D. Equipment Installation.

1. It shall be the responsibility of the equipment installer to ensure that no work done under other specification sections shall in any way block or otherwise hinder the equipment. All equipment shall be securely anchored in place.

E. System Air Balance.

1. General.

    a. The contractor shall employ the services of an independent system balancing company registered by AABC, NBC, or NEBB. The balancing contractors shall be limited to one of the following:

        i. Air Control Services 515 E. 19th St., Bakersfield, CA 93305 (661) 327-8755

        ii. Air Control Balancing 1959 N. Gateway #103, Fresno, Ca. 93727 (559) 454-8000

        iii. American Air Balance 4721 E. Hunter, Anaheim, Ca. 92807 (714) 693-3700

        iv. Los Angeles Air Balance Co. 1848 W. 11 St., Upland, Ca. 91786 (909) 931-1114

v. RS Analysis 111 Natoma Street, Folsom, Ca. 95630 (916) 351-9842

vi. National Air Balance 4171 Business Center Drive, Fremont, Ca. 94538 (510) 623-7000

b. Submit within thirty (30) days after receipt of contract, submittal data forms of the selected balance company for the testing and balancing of the air conditioning, heating, and ventilation systems.

c. After development of the balancing procedure to be followed for each respective system, a representative of the system balancing company shall periodically visit the jobsite, particularly before any insulation is applied to ducts or piping, and confirm the suitability of the ducts, piping, accessories, hardware, and access panels installed for balancing. Any noted deficiencies shall be reported to the Contractor in writing with a copy to the Engineer. Noted deficiencies shall be corrected at this time by the Contractor.

d. Final system testing and balance shall not begin until the system has been completed and is in full working order. The Contractor shall put all heating, ventilating, and air conditioning systems and equipment into full operation and shall continue the operation each working day during the balancing procedure. The balancing company shall be responsible for all adjustments to the heating, cooling and ventilating equipment necessary for the system to operate as specified. Upon completion conduct a running test under substantial load conditions demonstrating to the satisfaction of the Owner's representative that all equipment and controls are operating as intended and have been properly adjusted for these conditions.

e. The system balance company shall include an extended warranty of one hundred eighty (180) days after completion and acceptance of test and balance work, during which time the Engineer at his discretion may request a recheck, or resetting of any outlet, fan, etc., as listed in report. The system balance company shall provide technicians to assist the Engineer in any re-test required during this period. Seasonal re-balance during the first year of operation is part of the scope of this specification.

f. The flow quantities shown on the drawings are not to be considered absolute. If changes in flow quantities are required to attain comfort conditions in any area, the balancing company shall make the required changes at no extra cost.

2. Procedure.

a. The testing and balancing of the systems, including all equipment, ducts, piping, and accessories shall be done in strict compliance with the latest edition of the Procedural Standards for Testing, Adjusting, Balancing of Environmental Systems as published by National Environmental Balancing Bureau or equivalent AABC standard.

3. Acceptance of Tests.

    a. In the event any tests or inspections prove unsatisfactory, such shall be made a matter of record. Acceptance of the system shall be postponed until all defects or improper adjustments have been corrected and the work is again inspected and tests satisfactorily repeated.

4. Data to be Furnished.

    a. At completion of running tests two (2) complete sets of data listed below for all items of equipment shall be furnished for incorporation in Owner's Equipment Manual for the project:

    b. Manufacturer's equipment outline drawings.

    c. Manufacturer's performance curves for fans, pumps, and flow control devices and capacity tables for equipment.

    d. Pertinent running test data; such as system test points, test point data, horsepower, RPM, FLA, etc., including final instrument set points and adjustments as left.

5. Fan Drives.

    a. Shall be changed as necessary to obtain the desired flow rate at minimum brake horsepower and to avoid objectionable fan or air noise in any part of the building. As a part of the work of this contract, the Contractor shall make any changes in the pulleys, belts, and dampers or the addition of dampers, required for the correct balance as recommended by system balancing company, at no additional cost.

F. Temperature Controls:

1. General.

    a. A complete system of automatic temperature control shall be provided. Complete system shall consist of the existing plus that which is necessary for proper function and operation

    b. Wall plates for any control located in finished areas shall match finish of light switch plates in that same area.

    c. All conduit and wiring shall be installed in strict compliance with spec division 26, electrical.

    a. Sequence of Operation. Refer to temperature control diagram on the drawings. With initial submittal and on record drawings include narrative of system operation describing start-up, automatic operation, and shut-down.

2. Electrical Wiring. All electrical wiring and conduit in connection with the drawings shall be provided under Specification Division 23. Any wiring not shown on the drawings but required for proper operation of the automatic temperature control system shall be performed under this Section.

END OF SECTION

SECTION 31 23 33
TRENCHING AND BACKFILLING

1.00 GENERAL

1.01 SUMMARY

A. Excavating trenches for construction of utilities.

B. Trench backfill materials.

C. Backfilling and compacting requirements.

1.02 REFERENCES

A. Standard Specifications for Public Works Construction (SSPWC), latest edition.

1.03 SUBMITTALS

A. Materials source.

B. Sand equivalent test reports per ASTM D2419.

C. Certificates.

D. Drawings for shoring, bracing, sloping, or other provisions for worker protection for any excavation shall conform to the requirements of the CAL/OSHA Construction Safety Orders Requirements.

1.04 EXISTING UTILITIES

A. Drawings show existing major underground utilities from reference drawings. Prior to excavation, the Contractor shall notify the District's Representative to obtain any additional information which may be applicable to the Work.

B. Any incident of a utility being inadvertently damaged by the Contractor shall be immediately shutoff and then be immediately repaired by the Contractor at no cost to the District.

C. Contractor to pothole all utility connections and verify exact size, location and material prior to beginning construction and notify engineer of any discrepancies.

2.00 MATERIALS

2.01 APPROVALS

A. Imported material shall be approved by the District's Representative prior to being brought to the site. Provide a sample of the material in sufficient quantity for the District's Representative's use in evaluating the material.

2.02 TRENCH BACKFILL MATERIAL

A. Sand bedding shall have a sand equivalent (SE) of 30 or greater. The SE shall be evaluated during grading. Materials shall conform to the specification of the Geotechnical Study.

B. Backfill material shall conform to the requirements of Section 217-2 of the SSPWC.

C. Aggregate base course shall be per Plan.

D. Topsoil removed from trenches shall be stockpiled at locations approved by the District's Representative.

2.03 SOURCE QUALITY CONTROL

A. Inspection and testing shall be performed by the District's Representative.

3.00 EXECUTION

3.01 PREPARATION

A. Identify required lines, levels, contours, and datum.

3.02 TRENCH EXCAVATION

A. All saw cutting shall be neat, straight cuts and shall conform to Section 306-3 of the SSPWC. All cuts shall be square unless otherwise specifically noted on plans.

B. Trench excavation shall conform to Section 306-3 of the SSPWC and the following requirements:

1. The bottom of the trench shall be graded and prepared to provide a firm and uniform bearing throughout the entire length of the pipe barrel. Suitable excavations shall be made to receive the bell of the pipe and the joint shall not bear upon the bottom of the trench. All adjustments to line and grade shall be made by scraping away or filling in with sand under the body of the pipe and not by wedging or blocking.

2. If the trench is excavated below the required grade, correct any part of the trench excavated below the grade, at no additional cost to the District per the Geotechnical Study. Place the backfill material over the full width of trench in compacted layers not exceeding 6 inches deep to the established grade with allowance for the pipe base. If shoring is required, the trenches shall be shored and braced in accordance with the Trench Construction Safety Orders of the Division of Industrial Safety.

3. When subgrade is encountered that in the opinion of the District's Representative is unsuitable for pipe support, the District's Representative may order the excavation to be carried to an approved depth below the bottom of the pipe and backfilled with sand, to the lines and grades shown on the drawings and specified by the District's Representative.

4. The minimum width of the trench at the top of the pipe zone shall be as

necessary to install the pipe. The utility lines shall be centered in the trench. In the event of (1) actual physical interference between existing crossing subsurface utilities and the proposed utility lines and (2) vertical discrepancy in connecting proposed utility lines to existing utility system, a minimum clearance of 0.5 feet between the utility line and the crossing, interfering utility shall be provided, unless otherwise indicated on the plans.

5. Where existing utilities or tree roots are to be protected, trench excavation shall be by hand. No mechanical excavating equipment shall be used within 6 inches of any utility or root.

6. Trenching machinery may be used for excavations provided the specified trench width can be maintained.

3.03 TRENCH BACKFILL

A. Pipe bedding and trench backfill materials: Pipe bedding shall be either crushed rock or sand as specified on the plans. Sand bedding and backfill for utilities shall consist of material having a sand equivalent of at least 30. The backfill material shall be placed within the pipe zone that extends from the bottom of the pipe to at least 12 inches above the top of the pipe for the full width of the trench. The horizontal distance between the spring line of the pipe and the side walls of the trench shall be such that bedding material can be properly placed and compacted below the haunches of the pipe. Pipe bedding and pipe zone backfill shall be compacted to at least 95 percent relative compaction. Backfill material placement shall conform to provisions of Geotechnical Study.

B. Trench backfill placed above the pipe zone shall consist of suitable onsite or imported soil per Geotechnical Study. Mechanical compaction of trench backfill shall be performed and water consolidation (jetting) methods of compaction shall not be permitted. Trench backfill in landscape areas shall be compacted to a minimum of 90 percent relative compaction or per landscape specifications.

C. Trench Backfilling shall conform to the requirements of Sections 306-12 of the SSPWC and Geotechnical Study:

1. During the process of laying pipe in trenches, sufficient material shall be carefully placed and hand tamped about the pipe to hold it firmly to established line and grade. Oversized material, broken rock or shale, if encountered, shall not be used for backfill.

2. No motor driven mechanical compacting equipment shall be used over pipelines until the backfill has been compacted to 12 inches over the crown of the pipe.

3. All backfill material shall be deposited in horizontal layers not exceeding the thickness specified in Section 306-12 of the SSPWC and not exceeding 8 inches in thickness. The distribution of materials shall be such that all material following compaction and consolidation will form a homogeneous mass free of voids, pockets, streaks or other imperfections. Backfilling shall be done with earth free from lumps, hardpan, chunks, paving material, organic matter or other deleterious substances.

4. Jetting of bedding or backfill material to obtain specific moisture content or for compaction shall not be permitted. If encountered, existing fill in the utility

excavation shall be excavated and recompacted or removed and replaced with new fill materials per requirements of Section 2.02.

5. Compaction of all backfill material for trenches, pavements or structures, shall be per provisions of the Geotechnical Study. Appropriate warning detector tape shall be placed over all utilities.

6. Prior to final cleanup or resurfacing, the District's Representative shall take compaction tests in any backfill area and at any depth, with the Contractor providing equipment and operator to assist in such test. If any such compaction test fails, the Contractor shall correct such failure and pay for any retesting that is required. The District's Representative shall make as many tests as he feels is required to receive a satisfactory and acceptable job.

3.04 STOCKPILING

A. Stockpiling of imported materials or excavated materials shall direct surface water away from approved stockpile site to prevent erosion.

B. After stockpiles are removed, leave area in a clean and neat condition.

3.05 FIELD QUALITY CONTROL

A. Inspection and testing shall be performed by District's Representative.

END OF SECTION

SECTION 32 11 23
AGGREGATE BASE COURSES

1.00 GENERAL

1.01 SUMMARY

A. Aggregate base course for curbs, gutters, sidewalks, and fire access driveway.

1.02 RELATED SECTIONS

A. Section 31 20 00 Earthwork.

B. Section 32 12 16 Asphalt Concrete Paving.

C. Section 32 16 00 Curbs, Gutters, Sidewalks, and Driveways.

1.03 REFERENCES

A. Standard Specifications for Public Works (SSPWC), latest edition.

B. ASTM Standards.

C. State Standard Specifications (SSS), Caltrans, latest edition.

1.04 SUBMITTALS:

A. Submit material samples and reports in accordance with requirements of District.

B. Submit samples in sufficient quantities for material testing.

2.00 PRODUCTS

2.01 MATERIALS

A. Aggregate Base Material shall be Class 2 Aggregate Base conforming to SSS Section 26-1.02A. Aggregate Base shall have a minimum sand equivalence of 22 and a minimum R-value of 78 and shall be free of organic materials and other deleterious substances.

B. Aggregate Base materials used within building areas shall be free of asphaltic materials.

3.00 EXECUTION

3.01 EXAMINATION

A. Verify substrate has been inspected; gradients and elevations are correct, and dry.

3.02 AGGREGATE BASE PLACEMENT

A. Aggregate base placement shall conform to the provisions of the SSPWC, Section 301-2.

B. Level and contour surfaces to elevations and gradients indicated.

C. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.

D. Where the required aggregate base thickness is 6 inches or less, the watered base may be spread and compacted in one layer. Where the required thickness is more than 6 inches, the aggregate base material shall be spread and compacted in 2 or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches.

E. Aggregate base course shall be dense and unyielding upon proof-rolling with full water truck.

3.03 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch.

B. Scheduled Compacted Thickness shall conform to the provisions of the SSPWC Section 301-2.2.

3.04 FIELD QUALITY CONTROL

A. Inspection and testing shall be performed by the District's Testing Laboratory. Compaction testing will be performed in accordance with ASTM D1557, latest edition.

B. If tests indicate work does not meet specified requirements, remove work, replace and retest at Contractor's expense.

END OF SECTION

SECTION 32 12 16
ASPHALT CONCRETE PAVING

1.00 GENERAL

1.01 SUMMARY

A. Asphaltic concrete paving for parking lots and driveway pavements.

1.02 RELATED SECTIONS

A. Section 31 20 00 Earthwork.

B. Section 32 11 23 Aggregate Base Course.

1.03 REFERENCES

A. Standard Specifications for Public Works Construction (SSPWC), latest edition.

B. ASTM Standards.

1.04 SUBMITTALS

A. Submit asphalt concrete mix design(s) for approval of the District Representative.

1.05 TESTING AND INSPECTION

A. Testing and inspection of asphalt pavement mix(es) and testing of placed stabilizing base course and asphalt pavement will be performed by the District's Testing Laboratory. Testing and inspection will be performed so as to minimize disruption of work.

B. Allow the District's Testing Laboratory access to the mixing plant for verification of weights or proportions, character of materials used and determination of temperatures used in the preparation of asphaltic concrete mix.

2.00 PRODUCTS

2.01 GENERAL

A. Provide the aggregate base, and bituminous surface conforming to the requirements of the Standard Specifications for Public Works Construction (SSPWC).

2.02 PAVING MATERIALS

A. Asphalt Concrete: Asphalt concrete material shall be C2-PG 70-10 per SSPWC Section 203-6. The grading and proportioning of aggregates shall be such that the combined mineral aggregate conforms to the specified requirements.

B. Asphalt Emulsion: SSPWC Section 203-3, Grade SS-1h.

C. Prime Coat: Grade SC-70 per SSPWC Section 203-2.

D. Aggregates for base course shall conform to requirements of Specification Section 32 11 23, Aggregate Base Course.

2.03 ASPHALT PAVEMENT MIX

A. Combine mineral constituents in proportions to produce a mixture conforming to requirements of the SSPWC Section 203-6.

B. Percentage by weight of asphalt cement in mixture shall be in accordance with SSPWC Section 203-6.

C. Maintain thorough and uniform mixture.

D. Bring asphalt and mineral constituents to required temperatures before mixing. Ensure aggregates are sufficiently dry so as not to cause foaming in mixture.

3.00 EXECUTION

3.01 GENERAL

A. Execute Work in accordance with SSPWC Section 302 and the Geotechnical Study.

3.02 PREPARATION

A. Ensure grading of subgrade to required elevation. Subgrade preparation shall be per SSPWC Section 301.

B. Before final rolling, shape entire section, add additional sub-soil if necessary, and compact subgrade to provide grades, elevation and cross-section indicated. Points of finished subgrade surface shall be within 0.04 foot of elevations indicated on the Drawings.

3.03 BASE COURSE

A. Place aggregate base in accordance with requirements of SSPWC Section 301 and to the thickness shown on the Drawings. Grade and compact in 6-inch layers to at least 95 percent of compaction (ASTM D1557).

3.04 MAINTENANCE

A. Maintain the base course until the asphaltic pavement is in place. Maintenance shall include drainage, rolling, shaping and water as necessary to maintain the course in proper condition. Maintain sufficient moisture at the surface to prevent a dusty condition. Areas of completed base course that are damaged shall be conditioned, reshaped and re-compacted in accordance with the requirements of the Specifications without additional cost to the District.

3.05 TACK COAT

A. Prior to the application of the asphalt concrete, a paint binder (tack coat) shall be applied to all surfaces of walkway, curbs, gutters, manholes and drainage structures which will be in contact with asphalt pavement per SSPWC Section 302-5.4.

B. Coat surfaces of catch basins which are to remain free of asphalt with oil, or provide equivalent protection, to prevent asphalt adhesion.

3.06 PRIME COAT

A. Prior to the application of the asphalt concrete, a prime coat shall be applied at a rate of 0.20 to 0.40 gallons per square yard.

3.07 ASPHALT CONCRETE

A. Requirements: The bituminous concrete shall consist of mineral aggregate, uniformly mixed with bituminous material in a central plant in accordance with SSPWC Section 203-6. The percentage of asphalt binder shall be in accordance with SSPWC Section 203-6. The mixing plant and construction equipment shall conform to the requirements of SSPWC Sections 203-6 and 302-5.

B. Placing: Deliver bituminous mixtures to the work site temperatures specified in SSPWC Section 302-5.5. Spread and place in accordance with SSPC Section 302-5.5. Asphalt surface shall be fog-sealed.

C. Compaction: Initial or breakdown rolling and the final rolling of the uppermost layer of the asphalt concrete shall be in accordance with SSPWC Section 302-5.6. Compaction by vehicular traffic shall not be permitted.

3.08 JOINING PAVEMENT

A. Carefully make joints between old and new pavements or between successive days work in such manner as to insure a continuous bond between old and new sections of the course in accordance with SSPWC Section 302.

B. Expose and clean edges of existing pavement. Cut edge to straight, vertical surfaces. Paint all joints with a uniform coat of tack coat before the fresh mixture is placed. Prepare joints in the new pavement in accordance with SSPWC Section 302-5.7.

3.09 JOINING NON-PAVED AREAS

A. Where paving will join landscape or other non-hardscape area a redwood header shall be installed.

3.10 TOLERANCES

A. Flatness: Maximum variation of 1/8 inch when measured with a 10-foot straight edge.

B. Variation from True Elevation: Within 1/4 inch.

3.11 FIELD QUALITY CONTROL

A. Inspection and testing shall be performed by the District’s Testing Laboratory.

B. Field inspection and testing will be performed by the District's Testing Laboratory. The Contractor shall cooperate with such testing and shall give the District Representative advance notice of paving scheduling. Sufficient “Advance Notice” shall be determined by the District Representative.

C. If tests indicate materials do not meet specified requirement, replace material and retest at no additional cost to the District.

D. Frequency of Test: As determined by the District’s Testing Laboratory.

3.12 PROTECTION

A. After placement, protect pavement from mechanical injury.

END OF SECTION