

PROJECT MANUAL

FOR THE
NEW CONSTRUCTION OF:

PDC, SMART & WHAA BUILDINGS RENOVATION PROJECT

OWNER:

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NOTICE

THE FOLLOWING PORTIONS OF THIS
PROJECT MANUAL FOR

PDC, SMART & WHAA BUILDINGS

RENOVATION PROJECT

HAVE BEEN PREPARED

IN COOPERATION WITH THE OWNER:

SAN BERNARDINO CITY UNIFIED SCHOOL DISTRICT

- ◆ DIVISION 00 – BIDDING/CONTRACT REQUIREMENTS
 - ◆ DIVISION 01 – GENERAL REQUIREMENTS

DIVISION 00 – BIDDING / CONTRACT REQUIREMENTS

PROVIDED BY OTHERS

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PROVIDED BY OTHERS

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PART 1 - GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specifications sections which apply to work of this section as if printed herein.

1.1 SECTION INCLUDES

- 1.1.1 Removal of designated construction
- 1.1.2 Disposal of materials
- 1.1.3 Storage of salvaged materials
- 1.1.4 Cap and identify utilities

1.2 DEFINITIONS

- 1.2.1 Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged.
- 1.2.2 Disposal: Removal off-site of demolition waste and subsequently deposit in landfill acceptable to authorities having jurisdiction,
- 1.2.3 Existing to Remain: Items of construction that are not to be removed and that are not indicated to be removed.

1.3 MATERIALS OWNERSHIP

- 1.3.1 Historic items, relics, cornerstones, commemorative plaques, tables and similar objects encountered during demolition are to remain the Owner's property.
- 1.3.2 Carefully remove each item in a manner to prevent damage and deliver to Owner.

1.4 SUBMITTALS

- 1.4.1 Pre-demolition Photographs: Show conditions of existing adjacent construction and site improvements that might be misconstrued as damaged by demolition operations. Submit before work begins.

1.5 REGULATORY REQUIREMENTS

- 1.5.1 Conform to applicable codes for demolition work, safety of structures, electrical disconnection and reconnection, dust control and disposal of materials.
- 1.5.2 Comply with California Fire Code (CFC), California Code of Regulations, (CCR) Title 24, Part 9, Chapter 14 – Fire Safety During Construction and Demolition.
- 1.5.3 Obtain required permits from authorities.
- 1.5.4 Notify affected utility companies before starting work and comply with their requirements.

1.6 PROJECT CONDITIONS

1.6.1 Hazardous Materials: It is not anticipated that hazardous materials will be encountered in the work.

1.6.6.1 Hazardous materials will be removed by Owner before start of work.

1.6.6.2 Hazardous materials will be removed b Owner under separate contract.

1.6.6.3 If materials suspected of containing hazardous materials are encountered, do not disturb. Notify Construction Manager.

1.6.6.4 Conform to applicable regulatory procedures when discovering hazardous or contaminated materials.

1.7 SEQUENCING

1.7.1 Owner will conduct salvage operations before demolition begins to remove materials and equipment that the Owner chooses to retain. Verify this has been done prior to demolition.

1.8 SCHEDULING

1.8.1 Perform work during normal hours of operation.

1.8.2 Notify Owner in writing 5 days in advance of any required work to be performed on a weekend or holiday.

1.9 PROJECT CONDITIONS

1.9.1 Conduct demolition to minimize interference with adjacent and occupied building areas.

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

3.1 EXAMINATION

3.1.1 Correlate existing conditions with requirements indicated.

3.1.2 Inventory and record condition of items to be removed and salvaged.

3.1.3 Execute pre-demolition photographs.

3.1.4 Verify that hazardous waste remediation is complete.

3.2 PREPARATION

3.2.1 Existing Utilities: Locate, identify, disconnect and seal or cap off indicated utilities serving areas to be demolished.

3.2.2 Salvaged Items: Clean, pack and identify items for delivery to Owner.

3.2.3 Protect existing items which are not indicated to be salvaged, removed or altered.

3.3 NOT USED

3.4 SALVAGING OF DEMOLITION MATERIALS

3.4.1 Clean salvaged items.

3.4.2 Pack or crate items after cleaning. Identify contents.

3.4.3 Store items in secure area until delivery to Owner.

3.4.4 Protect items from damage.

3.4.5 Install salvaged items to comply with requirements for new materials and equipment.

END OF SECTION

PART 1 - GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specification sections which apply to work of this section as if printed herein.

1.1 SECTION INCLUDES: Description of requirements for materials, fabrications and installation of Miscellaneous Metal and accessory items as shown on drawings and necessary to complete the Miscellaneous Metal Work. Work to include but not be limited to the following:

1.1.1 Examine all other sections for work related to those sections which are required to be included as work of this Section.

1.1.2 Pipe railings, pipe sleeves, handrails and brackets.

1.1.3 Gratings at floor sinks, etc.

1.1.4 Channel door frames.

1.1.5 Formed and bent plate 14 gauge and heavier.

1.1.6 Utility enclosure gates.

1.1.7 Structural columns, base plates and miscellaneous structural sections.

1.2 RELATED WORK IN OTHER SECTIONS:

1.2.1 Section 054000 – Light Gauge Structural Framing.

1.3 REFERENCES AND STANDARDS:

1.3.1 ASTM A36 – Structural Steel.

1.3.2 ASTM A53 – Hot-Dipped, Zinc-Coated Welded and Seamless Steel Pipe.

1.3.3 ASTM A307 – Low-Carbon Steel Externally and Internally Threaded Fasteners.

1.3.4 ASTM A386 – Zinc-Coating (Hot-Dip) on Assembled Steel Products.

1.3.5 ASTM A501 – Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

1.3.6 AWS DI.1 – Structural Welding Code.

1.3.7 FS TT-P-31 Paint, Oil: Iron Oxide, Ready Mix, Red and Brown.

1.3.8 FS TT-P-641 Primer Coating, Zinc Dust-Zinc Oxide (for Galvanized Surfaces).

1.4 SUBMITTALS:

1.4.1 Provide shop drawings for all items listed and those therein omitted, that require Architect's review and coordination prior to fabrication and erection.

1.4.2 Submit manufacturer's product data and any samples as requested by the Architect to demonstrate size, texture, welds, factory finish, etc.

- 1.4.3 Submit shop drawings under provisions of Section 013300. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
- 1.4.4 Include erection drawings, elevations, and details where applicable.
- 1.4.5 Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
- 1.4.6 Submit Shop Drawings for welded Steel ladders, stairs, etc.
- 1.5 QUALITY ASSURANCE:
 - 1.5.1 Use skilled workers who are thoroughly trained and experienced and who are completely familiar with the requirements and methods to perform the scope of work as specified under this Section.
- 1.6 DELIVERY, STORAGE AND HANDLING:
 - 1.6.1 Use all means necessary to store, handle and protect the materials of this Section before, during, and after installation.
- 1.7 REQUIREMENTS:
 - 1.7.1 Field Measurements: Secure field measurements required for fabrication and installation of work. Coordinate fabrication of supports for equipment with manufacturer's printed literature and structural engineering drawings. Measurements are Contractor's responsibility. Field alterations will not be permitted without approval of the Architect.
 - 1.7.2 Dissimilar Metals: Where metals are in contact with concrete or other types of metals, paint contact faces of metal with heavy bituminous coating before installation.
 - 1.7.3 Railings are to be designed to be in conformance with minimum Uniform Building Code requirements, to resist a load of at least 200 pounds applied in any direction at any point to the top rail and also a vertical and horizontal thrust of 50 pounds per lineal foot applied to the top rail.

PART 2 – PRODUCTS:

- 2.1 GENERAL: Where two (2) or more identical articles or materials are required, provide products of same manufacturer. If specified materials are discontinued, furnish updated product at no additional cost.
- 2.2 ALL METALS must be free from any defects which would impair the strength, durability or appearance, and of the best commercial quality, for purposes intended and adequate to withstand strains and stresses to which they will be subjected. Protect metals from damage at the job, in transit, and until installed, inspected and approved.
- 2.3 MATERIALS:
 - 2.3.1 Structural Steel Such as Rolled Shapes, Angles, Plates, Anchors, Clips, Etc.: Conform with ASTM A36. Standard weight block steel galvanized after fabrication.
 - 2.3.2 HSS Steel Tubing: ASTM 500 Grade B Seamless.

- 2.3.3 Architectural and Miscellaneous Steel: Mild steel.
- 2.3.4 Wrought Iron Bars: ASTM A207 or ASTM A 189.
- 2.3.5 Steel Pipe Other Than Structural Uses: Conform with ASTM A120, seamless.
- 2.3.6 Steel Sheet: High quality, low carbon, hot-rolled sheet with good welding and forming qualities. ASTM A446 Grade A.
- 2.3.7 Galvanized Sheets: Hot-dipped and tight coated steel sheet conforming to ASTM A525. Coating weight to be no less than 1.25 oz. per square foot.
- 2.3.8 Welded Materials: AWS D1.1; Type required for materials being welded.
- 2.3.9 Galvanized Rolled Shapes, Angles, Channels, Bolts, Etc.: Conform with ASTM A123.
- 2.3.10 Primer Paint:
 - 2.3.10.1 General: Compatible with type and color of special or finish coatings described in Section 099100. FS TT-P-31, Red: For shop application and field touch-up.
 - 2.3.10.2 Touch-up Primer for galvanized surfaces: FS TT-P-641 or SSFC-20.
 - 2.3.10.3 Cleaning Metals Prior to Priming:
 - 2.3.10.3.1 Exterior Exposed Metals: SSPC-SP6 Commercial blast clean.
 - 2.3.10.3.2 Interior Metals: SSPC-SP2 Hand tool clean or SSPC-SP3 Power tool clean.
 - 2.3.10.4 Standard Shop Paint: Rust-inhibitive coating conforming to governing air pollution control requirements (AQMD).
 - 2.3.10.4.1 Exterior Exposed Metals: High performance coating primer, to meet slip coefficient and creep requirements for classification as a Class B coating using ASTM A325 or A490 Bolt Specification, Appendix A, No. 90-97 Tnemec-Zinc Primer, 2.5 – 3.5 dry mils, as manufactured by Tnemec Company, Compton, California, or equal (no known equal).
 - 2.3.10.4.2 Interior metals: Regular metal primer, No. 10-99 V.O.C. compliant, as manufactured by Tnemec Company, Compton, California, or equal (no known equal).
- 2.3.11 Machine Bolts: Conform with ASTM A307.
- 2.3.12 Expansion Anchors: Hilti KB-TZ and not less than 3/8 inch diameter, threaded type for anchoring with the bolt head out. Test by Owner's Testing Laboratory in accordance with California Building Code, Chapter 19.
- 2.3.14 Welding Electrodes: Conform with AISC and the Code for Arc and Gas Welding in Building Construction, A.W.S. Publication D1.1; use E-70XX series electrodes.

- 2.3.15 Stainless Steel Tube and Pipe: Conform with ASTM A554, ornamental grade, Type 302 or 304, Schedule 40, seamless with No. 4 finish.
- 2.3.16 Stainless Steel Shapes, Angles, Plates, Etc.: conform with ASTM A167, Type 302 or 304 with No. 4 OR rolled finish.
- 2.3.17 Metal Gratings, Trench Covers and Frames: Manufactured by Alhambra, Neenah or equal, cast iron heavy-duty traffic type, sizes and shapes as required.
- 2.3.18 Steel Pipe for Structural Uses: Conform with ASTM A53, Type S seamless, Grade B.
- 2.3.19 Cast Steel: Conform with ASTM A27.
- 2.3.20 Iron Castings: Conform with ASTM A48.
- 2.3.21 Malleable Iron Castings: Conform with ASTM A47.
- 2.3.22 Liquid Galvanizing Compound: "Drygalv", Fesco Inc., Los Angeles (213) 254-9131, "Galvicon", V. B. Anderson Co. (714) 547-6684; "Z.R.C. Cold Galvanizing Compound", Mechanical Distributors (213) 698-6655, or equal.

PART 3 – EXECUTION:

3.1 PREPARATION:

- 3.1.1 Obtain Architect approval prior to site cutting or making adjustments not scheduled.
- 3.1.2 Clean and strip site primed steel items to bare metal where site welding is scheduled.
- 3.1.3 Make provision for erection loads with temporary bracing. Keep work in alignment.
- 3.1.4 Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate Sections.

3.2 WELDING:

- 3.2.1 Except for modifications indicated on drawings and specified herein, AISC Code of Standard Practice for Steel Buildings, and AWS Code for Fusion Welding and Gas Cutting in Building Construction, both as amended to date, govern materials, fabrication and erection of work under this Section.
- 3.2.2 Make welds in accordance with best standard practice. Perform welding on unexposed sides to prevent pitting, discoloring, weld-halo and other surface imperfections. Thoroughly clean surfaces to be welded. Welds must show a uniform section and reasonable smoothness without distortion. No exposed spot welding permitted. Dress and finish exposed surfaces of welded joints to produce invisible connections. Furnish welding alloys in the same color and character as the surfaces of the metals joined.

3.3 WORKMANSHIP, FABRICATION AND ERECTION:

- 3.3.1 Insofar as possible, fit and shop assemble work ready for erection. Accurately make jointing and intersections in true planes, and with adequate fastenings. Make exposed joints even and smooth. Grind exposed weld joints smooth and flush.
 - 3.3.2 Provide holes of proper size and in correct location for attachment of work of other trades. Cut, tap, and drill as required. Finished items must be free from kinks, twists, burrs and open joints. Damaged or distorted materials are not acceptable.
 - 3.3.3 Provide work to be built in concrete or masonry of proper form required for anchorage, or provide with concealed anchors.
 - 3.3.4 Form work true to detail, with clean, straight and sharply defined profiles. Close fit exposed joints and make where least conspicuous.
 - 3.3.5 Install supporting members, fastenings, frames, hangers, bracing, brackets, bolts, angles, and the like as required to set and connect items of miscellaneous metal to concrete, steel or wood framing.
 - 3.3.6 Countersink holes for exposed screwheads. Provide necessary lugs, brackets, and clips so work can be assembled and installed in a neat and suitable manner.
 - 3.3.7 Conceal fastenings where possible. Unless otherwise indicated provide flathead or countersunk oval bolts and screwheads as best suited for the purpose.
 - 3.3.8 Weld in place plates for mounting item(s) of finish hardware.
 - 3.3.9 Provide bolts, anchors, inserts, and other miscellaneous steel and iron fastenings in forms before concrete is poured; or as to be built into masonry, as indicated on drawings, details or schedules, or as necessary to complete the work. Examine and check the Architectural, Structural, Mechanical and Electrical Drawings for number, type and locations of each items.
- 3.4 MISCELLANEOUS ITEMS:
- 3.4.1 Furnish, fabricate, and install miscellaneous angles, channels, bent plate, clips, anchors, and other miscellaneous metal work required and as indicated on drawings. Form as detailed or if not detailed, as required for location and purposes served, and in accordance with the applicable provisions specified herein. Furnish and install miscellaneous metal items not specifically mentioned herein, or in other sections, but which are customarily considered as part of the work, the same as if fully specified herein and detailed on drawings.
 - 3.4.2 Furnish and install light steel structural items not noted on Structural Drawings or called for under "Structural Steel" Section but which are shown on the other drawings.
 - 3.4.3 Furnish and install sleeves through masonry or concrete walls and footings. Fabricate of standard weight steel sections of size sufficient to allow ¼ inch clearance between the sleeve and item to be inserted.
 - 3.4.4 Furnish and install anchors, brackets, and plates of suitable steel where required in connection with steel, masonry, wood and concrete construction.
 - 3.4.5 Pipe Handrails:

- 3.4.5.1 Fabricate galvanized steel pipe handrails from standard weight steel pipe, minimum 1-1/4 inch to maximum 1-1/2 inch diameter. Unless detailed otherwise in the drawings. Railings must be flush type with joints welded and ground smooth. Secure rails to concrete with flange fittings and expansion bolts. Secure railings to stud walls with flanges bolted to backing plates or minimum 3 by 4 blocking with a 35 metal angle clips top and bottom of the blocking.
- 3.4.5.2 Return pipe handrail ends against the adjacent walls and cap. Weld vertical pipe supports to the channels or fit over steel dowels welded to the top flange of channel stringer and secure over the dowel with flush head set screws. Grind bottom edges of vertical pipe supports smooth and flush with top flange of channel stringer. Include hangers, bolts, angles, brackets, and other accessories required for complete assembly and installation. At concrete floor terminations, set pipe rail standards in pipe sleeves, previously cast in concrete, and set in place with "Por-Roc", manufactured by the Hallemite Company unless detailed otherwise in the drawings. Wherever required, provide removable rails and gates.
- 3.4.5.3 All welded joints and surfaces shall be ground smooth, no sharp or abrasive corner edges or surfaces. Wall surfaces adjacent to handrail shall be smooth.
- 3.4.6 Ladders: Meet or exceed State Industrial Construction Safety Orders and OSHA.
 - 3.4.6.1 Steel: As Detailed on Drawings – 2 1/2-inches by 3/8 inch side rails and braces; 1 inch round rungs. Galvanized after fabrication. See roof hatch section for further information.
- 3.4.7 Equipment Support System: Provide galvanized Unistrut, or other approved.
 - 3.4.7.1 Main Runner: P5500 channel at 8 foot centers.
 - 3.4.7.2 5/8-inch hanging rods at 48 inches on centers and hanger clamps.
 - 3.4.7.3 Cross Runner: P3000 channel at 4 foot centers.
 - 3.4.7.4 P3047 "U" shaped fittings.
 - 3.4.7.5 Provide and size pipe clamps as required.
 - 3.4.7.6 Provide hardware and accessories as required.
- 3.4.8 Bollards: 6 inch diameter galvanized extra heavy weight (Schedule 80) steel pipe set in a concrete foundation and filled solid with 2,000 psi concrete as specified in Section 033000, unless otherwise noted on the drawings. Provide 12 inch diameter by 48 inch deep concrete footings unless noted otherwise on the drawings.
- 3.4.9 Trench Covers, Expansion and Seismic Joint Covers:
 - 3.4.9.1 Acceptable Manufacturers:
 - 3.4.9.1.1 Construction Specialties, Inc., a member of the C/S Group, Los Angeles.
 - 3.4.9.1.2 MM Systems Corporation, Pendergrass, Georgia.

- 3.4.9.1.3 Balco / Metalines, Inc., Wichita, Kansas
- 3.4.9.2 Joint Covers: Equal to C/S AFW Series extruded aluminum finished to match predominant adjacent material. Provide compatible shapes and configurations at intersecting floor, wall, and ceiling conditions where required.
- 3.4.9.3 Trench Cover: Equal to MM Systems ¼ inch, Model No. TF-288(R). Trench cover plate recessed for VCT Flooring, at Science Building(s) and or as detailed on the drawings. Minimum trench width 12 inches. Plate style shall be diamond stainless steel finish. Provide all necessary anchors, sleeves, frame per manufacturers requirements. Recess minimum 1/8 inch the trench cover to be flushed with vinyl tile finishes. ASTM B209 for aluminum and aluminum-alloy sheet and plate.
- 3.4.9.4 Install work in accordance with manufacturer's recommendations. Runs shall be in continuous lengths without butt joints.
- 3.4.10 Ceiling Access Doors: Provide exterior type single-door by Dur-Red Products, Model No. TCA, 30-inches by 36-inches in size unless noted otherwise on the drawings.
- 3.4.10.1 Door Leaf: 1-inch thick solid core rigid fiberglass with 20 gauge steel outer shell.
- 3.4.10.2 Finish: Primer grey and painted minimum (2) coats of paint. Color to match adjacent ceiling color finish.
- 3.4.11 Install ceiling access door where access to the enclosed attic spaces are required and/or as shown in the drawings. If not shown in the drawings, provide one ceiling access panel in each enclosed drywall ceiling room. Where ceiling is rated, the ceiling access door shall meet or exceed the rating of the ceiling. All ceiling access doors shall receive keyed locks.
- 3.4.12 Fabricate steel channel and angle frames for doors, duct openings, scuttles, mechanical equipment, louvers, and other frames as shown and detailed to exact size required and in accordance with approved shop drawing. Neatly join corners, weld and grind smooth. For securing to concrete or masonry, weld concealed anchors on the back. Secure bar stops to frames with countersunk flathead screws or plug weld from the back. Prepare steel frames to receive the necessary hardware. Where mechanical equipment such as fans, blowers, etc., and sheet metal are shown or specified to be attached in steel frames, the drilling, tapping and attachment must be done by trade involved.
- 3.4.13 Furnish corner guards, bumpers, etc., of sizes and shapes indicated on the drawings and with anchors welded to the backs and of sizes and spacing shown on the drawings. Corner guards shall be 4 inches by 4 inches by height of loading dock or 48 inches high CG-2 rubber as manufactured by Durable Corporation. Anchor corner guard to existing or new concrete surfaces edges per manufacturers standard installation requirements. Provide manufacturers one (1) year warranty.
- 3.4.14 Pipe Guards: Provide minimum 6 inch diameter extra-heavy duty steel pipe guard posts set in minimum 16 inch diameter by 48 inch deep concrete footings. Fill pipe solidly with concrete, "rounding-off" top or with a 3/16 inch steel plate cap continuously welded and edges ground smooth.

3.4.15 Molded Dock Bumpers: Use molded dock bumpers Model BB 4 inch thick by 12 inches high by 24 inches long as manufactured by Durable Corporation or equal. Bumpers shall be molded in one piece of all new nylon and polyester reinforced rubber.

3.4.15.1 Bumpers shall have a durometer reading of 80 plus or minus 5, tensile strength of 80 plus or minus 5, tensile strength of 950-1,050 psi, and an impact recovery (ASTM 1170) of 95 percent.

3.4.15.2 Anchor bumpers to new or existing concrete per manufacturer's requirements. Use minimum 5/8 inch sleeve anchors minimum length 3 inches long. Bumpers shall be placed to truck width and one bumper placed in the middle. The middle bumper shall be positioned horizontally on the 24 inch length. The other two bumpers shall be placed vertically on 12 high at each end of the truck width. Tops of the end and middle bumpers shall be at the same height from the top deck edge. Height from the top of the deck on loading dock surface to the top of the bumpers shall be based on the types of trucks used, various truck bumper heights and manufacturers standard height requirements.

3.4.15.3 Provide one (1) year warranty and red reflections.

3.4.16 Provide hot-dipped galvanized steel for exterior use.

3.5 FINISH:

3.5.1 Except where indicated, or specified to be galvanized, clean miscellaneous steel and iron of any grease, rust, mill scale, or other foreign matter, and give one shop coat of the specified primer. Do not prime material to be embedded in concrete.

3.5.2 After welding is completed, repair damage to the galvanizing by applying a liquid galvanizing compound in accordance with manufacturer's instructions to provide a coating equal to original finish.

3.5.3 All exterior structural steel shall be hot dipped galvanized and painted per the painting schedule.

END OF SECTION

PART 1 – GENERAL:

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specification sections which apply to work of this section as if printed herein.

1.1 SUMMARY

1.1.1 Section Includes: Wood framing, miscellaneous furring for wall finishes, miscellaneous blocking and rough hardware.

1.1.2 Related Sections:

1.1.2.1 Finish Hardware, Section 087000.

1.1.2.2 Millwork and other finish carpentry.

1.2 REFERENCE STANDARDS

1.2.1 Softwood Lumber: PS 20 – American Softwood Lumber Standard.

1.2.2 NFPA – National Forest Products Association, National Design Specifications for Stress Grade Lumber and its Fastening.

1.2.3 West Coast Lumber Inspection Bureau (WCLIB), Number 16 – Standard Grading and Dressing Rules for West Coast Lumber.

1.2.5 2016 CBC Chapters 23 and 35.

1.2.6 Plywood: U.S. Product Standard PS1 95.

1.3 QUALITY ASSURANCE

1.3.1 Provide lumber with visible grade stamp of an approved agency certified by NFPA.

1.4 DELIVERY, STORING AND HANDLING

1.4.1 Deliver and store materials at job site in a safe area, out of traffic and shored up, off ground surface.

1.4.2 Identify framing lumber by grades and store grades separately from each other.

1.4.3 Protect products with adequate waterproofing.

1.4.4 Exercise care in off-loading lumber to prevent damages, splitting and breaking.

1.4.5 Seasoning:

1.4.5.1 Deliver materials at earliest date possible to allow maximum; drying time on site.

1.4.5.2 Pile and strip lumber at site to allow free circulation of air with pile protected from sun and moisture.

1.4.5.3 Air-season lumber for at least 60 days before covering with finish materials.

PART 2 – PRODUCTS

2.1 MATERIALS

2.1.1 Lumber: PS 20 and WCLIB Standard Number 16; Douglas Fir/Larch; graded in accordance with NFPA Grading Rules; maximum moisture content of 19 percent, grades as scheduled on drawings.

2.1.1.1 Douglas Fir shall bear WCLIB grade stamp.

2.1.1.2 Pressure treated Douglas Fir shall be No. 2 minimum and bear the AWP quality mark. Cuts and holes shall be treated per AWP M-84 (statements such as "or to refusal" are not permitted).

2.1.1.3 Comply with provisions of Title 24, CBC Section 2303A, Part 2.

2.1.2 Plywood:

2.1.2.1 Plywood for Roofs, Walls, and Floor Sheathing: PS 1-83 Structural I grade, APA C-D, exterior glue, except B-D for electrical and telephone panels.

2.1.2.2 Comply with CBC Standard 23-2.

2.1.2.3 Roof and shear wall plywood shall be nominally 4 feet by 8 feet in size. Do not use sheets less than 8 square feet, nor less than dimensions noted in paragraph 3.8 Plywood Placement.

2.2 ACCESSORY MATERIALS

2.2.1 Nails, Spikes, and Staples: Common (with standard lengths), except as otherwise indicated, galvanized for exterior locations, high humidity within conditioned spaces, and treated wood; plain finish for other interior locations; size and type to suit application.

2.2.2 Steel Hardware and Stock Framing Products by Connectors: ASTM A36 steel, galvanized for exterior applications, Simpson Strong-Tie Company. Products by KC Metals, or other approved manufacturer may be substituted if equal.

2.2.2.1 Comply with 2311.61.1, Title 24, Part 2.

2.2.3 Lag Bolts: FS FF-B-561.

2.2.4 Wood Preservative: Wolmanizing treatment at least two (2) weeks prior to delivery to site. Treatment shall meet or exceed AWP P-5 and Federal Standard TT-W-550.

2.2.5 Machine Bolts: ASTM A307.

2.2.6 Pressure Treatment: Sills and plates in contact with concrete or masonry within 48 inches of the ground, and wood posts and columns bearing directly on concrete shall be water-borne preservative pressure treated in accordance with paragraph 2317, Title 24, Part 2.

2.2.6.1 At cuts, holes, notches and other field operations which expose a surface not factory treated with preservative, field apply preservative material compatible with original material shall bear mark LP-2 AWP.

PART 3 – EXECUTION

3.1 EXAMINATION

- 3.1.1 Selection of Lumber: Carefully select members. Ensure that exposed members are free of heart center. Select members so that knots and obvious defects will not interfere with placement of bolts, proper nailing or making proper connections, and not impair achievement of proper finished appearances where to be exposed.
- 3.1.2 Cut out and discard defects which render a piece unable to serve its intended function. Lumber may be rejected by Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.

3.2 GENERAL FRAMING

- 3.2.1 In addition to framing operations normal to fabrication and erection indicated on drawings, install wood backing required for work of other trades, and for casework, chalkboards, toilet partitions and etc., as required.
- 3.2.2 Set horizontal and sloped members with crown up.
- 3.2.3 Non-bearing stud walls, sills, and trimmers may be anchored to concrete per Structural Drawings.
- 3.2.4 Wall and partition studs and mullions shall be continuous from sill to plates. Run at least two (2) studs on each side of openings in stud walls for openings in exterior walls and in partition openings larger than 5 feet, and partitions from sill to plate. In addition, place one (1) stud trimmer to support each end of lintels over openings, unless shown otherwise.
- 3.2.5 Provide double plates with joints staggered and lapping at least 4 feet and splice. Nail as required on Drawings.
- 3.2.6 Install nailing blocks and backing necessary for attachment of grounds, finishes, trim, fixtures, and do required cutting, furring, and backing for plumbing and heating pipes, fixtures, etc., as detailed in the Drawings or approved by the Structural Engineer and approved by the Division of the State Architect, Office of Regulations Services.
- 3.2.7 Frame stud partitions, furring and walls containing fire cabinets, electric panels, plumbing, heating, or other pipes to give proper clearance. Cutting of studs in bearing partitions and shear walls is prohibited unless specifically detailed.
- 3.2.8 Do not place pipes exceeding 1/3 of plate width in partitions used as bearings or plywood-sheathed walls, but place them in furring completely clear of studs, unless detailed otherwise. Place approved piping in center of plates using neat hole. No notching is allowed. In no case, allow pipes to pass through plates less than 5-1/2 inches wide.
- 3.2.9 Unless otherwise indicated, provide 2 inch by 6 inch studs at 16-inches on centers. Refer to Structural Drawings for Simpson Metal Strap Ties, strap length, nail size and nail spacing where plates are broken.

- 3.2.10 Provide cross-bridging at 10 feet on centers maximum for all joints and rafters more than 10-inches deep. Use wood 2 inch by full depth of joist or rafter or approved metal type bridging. Nail metal bridging.
- 3.2.11 Provide isolated posts with connections at top and bottom; Simpson CC caps or CB base unless specifically detailed otherwise.
- 3.2.12 Double joists under parallel partitions with solid blocking between joist over points of support.
- 3.2.13 Provide a Simpson "CB" Steel Base Plate for untreated wood posts where they are or will be in contact with concrete.

3.3 FIRE BLOCKING

- 3.3.1 Fire Blocking shall conform with the requirements of Section 708, 2013 CBC.
- 3.3.2 Ensure that no fire stop is less than nominal 2 inches thick and no less in width than enclosed space within partition.
- 3.3.3 Provide stud wall and partitions with continuous rows of bridging or fire stops which will form a complete and effective separation in entire width of partitions, placed in such a manner that there will be no concealed air spaces greater than 8 feet in vertical dimension.

Intermediate stops may be in line with opening headers. Provide furred space between stud walls and partitions with continuous fire stops at same elevation as those in the enclosing walls which must be installed horizontally, thus forming a solid stop from outside to outside of studs. At concealed draft passages or shafts including furring spaces, ensure that maximum dimension is no more than 8 feet. Provide fire stop partitions at suspended ceilings.

3.4 BEARINGS

- 3.4.1 Make bearings full unless shown otherwise.
- 3.4.2 Finish bearing surfaces on which structural members are to rest so as to give sure and even support. Where framing members slope, cut or notch ends as required to give uniform bearing surface.

3.5 SHIMMING

- 3.5.1 Do not shim framing member except where specifically shown or required by drawings.

3.6 BLOCKING

- 3.6.1 Install blocking required to support items of finish and to cut off concealed draft openings, both vertical and horizontal, between ceiling and floor.

3.7 ALIGNMENT

- 3.7.1 On framing members to receive a finished surface, align finish sub-surface to vary not more than 1/8-inch from plane of surface of adjacent framing and furring members.

3.8 PLYWOOD PLACEMENT

- 3.8.1 Minimum Plywood Panel Sizes shall be as follows:

3.8.1.1 In horizontal plywood diaphragms, no panel less than 24 inches wide or 48 inches long shall be used.

3.8.1.2 In vertical plywood diaphragms, no panel less than 16 inches wide shall be used.

- 3.8.2 Center joints accurately over support unless otherwise shown on Drawings. Provide gapping of plywood substrate of 1/8-inch at abutting joints at all walls.

- 3.8.3 Protect plywood from moisture until succeeding component or materials are installed to cover plywood. Delaminating plywood shall be removed and replaced.

- 3.8.4 All roof plywood sheathing all edges shall be plywood clip, use Simpson Plywood clips. If the roof plywood sheathing per the framing plan, all edges are to be blocked, then omit the use of the plywood edge clips.

- 3.8.5 At plywood wall shear panels, extend (or cover) portions of the stud wall, extend the plywood panel to the adjacent wall or where a stud wall intersects the shear paneled wall. The non plywood shear panel wall the nailing shall be 6 inches by 6 inches by 12 inches Field with 10d nails.

3.9 FASTENING

- 3.9.1 Use only common wire nails or spikes of standard lengths and gauges as specified Table 23A-1-G of 2013 CBC.

- 3.9.2 For conditions not covered on drawings, Contractor to request clarification or provide penetration into piece receiving point not less than 1/2 length of nail or spike, provided that 16d nails may be used to connect two (2) pieces of nominal 2 inch thickness as specified by the Architect, and/or Structural Engineer and approved by the Division of the State Architect.

- 3.9.3 For bolts, drill holes 1/32-inch to 1/16-inch larger in diameter than bolts being used. Drill straight and true from one side only.

- 3.9.4 Bolt threads shall not bear on wood. Use washers under head and nut where both bear on wood. Use washers under nuts.

- 3.9.5 For lag-screws, and wood screws, pre-bore holes in accordance with CBC Standard, Sections 2337 and 2339, respectively.

- 3.9.6 Screw, do not drive, lag screws and wood screws.
- 3.9.7 Nailing schedule shall be per Title 24, Table 23A-1-Q.

END OF SECTION

PART 1 - GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specification sections which apply to work of this section as if printed herein.

1.1 SUMMARY

1.1.1 Section includes: Sealants and backing, primers, and bond-breakers as indicated on the Drawings and specified herein. Work will include, but is not limited to the following locations:

1.1.1.1 Expansion and control joints.

1.1.1.2 Sills jambs and heads of windows, doors louvers and similar openings where they abut dissimilar materials.

1.1.1.3 Horizontal joints.

1.1.1.4 Hidden joints expected to undergo minimal movement.

1.1.2 Related Work:

1.1.2.1 Glass and glazing and appurtenant sealant systems.

1.2 REFERENCE STANDARDS

1.2.1 Provide and install in strict compliance with 2019 CBC Requirements.

1.3 SUBMITTALS

1.3.1 Submit manufacturer's printed literature and installation instructions on specified materials for review.

1.3.2 Submit manufacturer's standard colors of materials for selection.

1.3.3 Submit standard size sample of back-up material, primer and bond breaker proposed for each system.

1.4 QUALITY ASSURANCE

1.4.1 Proper caulking and proper installation of sealants requires that installers be thoroughly trained and experienced in the necessary skills and thoroughly familiar with the specified requirements.

1.4.2 For caulking and installation of sealants throughout project, use only personnel who have been specifically trained in such procedures and who are completely familiar with the joint details shown or required, and the installation requirements called for in these specifications.

1.4.3 Coordinate this work with work of other sections to ensure proper installations.

1.4.4 Provide written certification that materials in contact with the sealants and appurtenant components, such as gaskets, spacers, setting blocks, concrete curing compounds,

aluminum finishes, etc., are compatible with the sealants after 21-days exposure to ultra violet 2,000 – 4,000 (micro-watt radiation).

- 1.4.5 Provide adhesion test data to production samples of metal and glass/spandrels, tested in accordance with ASTM C794.

1.5 GUARANTEES AND WARRANTIES

- 1.5.1 Provide two (2) year guarantee against defects in materials and workmanship of materials and installation. Include replacement or repairs as may be required by Owner.

PART 2 – PRODUCTS

2.1 SEALANTS

- 2.1.1 Horizontal Non-Traffic-Bearing Surfaces: Provide acrylic or terpolymer acrylic base, chemical curing, self-leveling type sealants, non-sagging, uniform, homogeneous and free from lumps, capable of being continuously immersed in water, withstand movement up to 12.5 percent of joint width, and satisfactorily gunnable at 70 degrees F., non-staining and non-bleeding, in colors to be selected by Architect.
 - 2.1.1.1 Acceptable product is Mono manufactured by Tremco, and one (1) part Acrylic Sealant manufactured by DAP.
- 2.1.2 Horizontal Traffic-Bearing Joints: Provide multi-component, self-leveling polyurethane joint sealant meeting ASTM C920 and Federal Specifications TT-S-00227E, Type I Class A, capable of movement to plus or minus 25 percent.
 - 2.1.2.1 Acceptable product is THC-900 as manufactured by Tremco, and Vulcem 245 as manufactured by Mameco.
- 2.1.3 Vertical Surfaces: Provide three-part epoxidized polyurethane terpolymer sealant non-sagging, gun grade, meeting Federal specifications TT-S-00227E, Class A, Type II, and ASTM C920, Type M, Grade NS, Class 25, use NT, M, A and O.
- 2.1.4 Hidden, Paintable, or Low Movement Interior Joints: Provide materials in compliance with Federal Specifications TT-S-001657, Type I, Butyl type, able to withstand joint movement to maximum 5 percent.
 - 2.1.4.1 Acceptable product is Dymeric as manufactured by Tremco, and Vulkem 227 as manufactured by Tremco.
- 2.1.5 Acoustical Sealants: Where required, provide acoustical sealants manufactured by Tremco or other approved; highly resilient, permanently flexible, and shrink and stain resistant.
- 2.1.6 Fire Rated Sealants: Where scheduled and as required to maintain fire ratings of penetrations through fire rated assemblies. Provide UL listed products, passing ASTM E84 and E814. Provide "Fire-Shield" by Tremco; "PR-855" by PRC or "5000 Fire Seal" by PTI. Conform to UL System No. 211, unless indicated otherwise.

2.2 ACCESSORIES

- 2.2.1 Primers: Where necessary, provide primers compatible with not only sealant, but substrate and finish on which to be applied. Primers are to be non-staining type and must have been specifically recommended for this installation by their manufacturer.
- 2.2.2 Back-up Materials: Provide one of the following, as recommended for the particular joint construction and sealant type:
 - 2.2.2.1 Closed-cell resilient urethane or polyvinyl-chloride foam
 - 2.2.2.2 Closed-cell polyethylene foam
 - 2.2.2.3 Closed-cell sponge of vinyl or rubber
 - 2.2.2.4 Polychloroprene tubes or beads
 - 2.2.2.5 Polyisobutylene extrusions
 - 2.2.2.6 Oil-less dry jute
 - 2.2.2.7 Preformed support strips for tile control joints and expansion joints
- 2.2.3 Bond Breaker: Use only one of the following as best suited for the specific application and as recommended by the manufacturer of the sealant to be used.
 - 2.2.3.1 Polyethylene tape, pressure-sensitive adhesive, with the adhesive required only to hold tape to the construction materials shown.
 - 2.2.3.2 Aluminum foil conforming to MIL-SPEC-MIL-A-148E.
 - 2.2.3.3 Wax paper conforming to Federal Specifications UU-P-270.
- 2.2.4 Masking Tape: For masking around joints, provide masking tape conforming to Federal Specifications UU-T-106c.

PART 3 – EXECUTION

3.1 PREPARATION

- 3.1.1 Joint and surfaces which are to be caulked or sealed shall be clean, dry and free of dust, loose mortar and other foreign materials.
- 3.1.2 Clean ferrous metals of rust, mill scale and coatings by wire brush, grinding or sandblasting. Remove oil, grease and/or temporary protective coatings with high performance cleaners, as approved by sealant manufacturer, such as Tremco No. 200 cleaner.
- 3.1.3 Joint dimensions for sealant should be reviewed and installed in accordance with sealant manufacturer's printed instructions. In no case should the sealant application be less than 1/4-inch wide, and 1/4-inch deep, except in specific metal-to metal curtain wall applications, and then as recommended by the sealant manufacturer.
- 3.1.4 Do not caulk joints until they are in compliance with requirements of the approved manufacturer of the materials, the details as shown on the Drawings, and the specific requirements of other sections of the specification.

3.2 INSTALLATION

- 3.2.1 Apply and install sealant where shown on drawings, or if not shown on Drawings, apply and install sealant materials and products which could lead to infiltration of moisture, water, light, or air blown particles into building; and within building where changes of materials in same or different planes could allow moisture, water, air, or light to penetrate.
- 3.2.2 Provide acoustical sealants on, around and between building construction members such as framing, panel boxes, cutouts for penetrations of other materials or equipment, etc., where walls and floors are designated to be sound attenuated or acoustically treated.
- 3.2.3 Install joint backing with a blunt instrument so as not puncture the surface skin. Size of joint backing should be determined by taking the joint width and adding 25 percent to assure proper compression of backer rod.
- 3.2.4 Apply sealant with caulking gun, using proper nozzles. Use sufficient pressure to properly fill the joints with sealant to the back-up materials.
- 3.2.5 After joints have been completely filled, they shall be neatly tooled to eliminate air pockets or voids, and to provide a smooth, neat appearing finish to intimate contact with interfaces. After tooling, surface of sealant shall be free of ridges, wrinkles, sags, air pockets and embedded impurities.
- 3.2.6 It is recommended that 40 degrees F. minimum application temperature be maintained for joint sealant installations. When it is necessary that applications be made at lower temperatures, take precautions to assure that joints have clean, dry, and frost-free surfaces. Submit a letter by sealant manufacturer's representative, verifying that surfaces are acceptable.

END OF SECTION

PART 1 – GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specification sections which apply to work of this section as if printed herein.

1.1 SUMMARY

1.1.1 Section includes: Exterior and interior glass and glazing, including glazing clips, channels, compound and glazing beads, unless furnished with frame to be glazed as indicated on the Drawings and specified herein.

1.1.2 Related Sections:

1.1.2.1 Section 079000 – Caulking and Sealants

1.1.2.2 Section 081113 - Steel Doors and Frames

1.2 REFERENCE STANDARDS

1.2.1 FS DD-G-451d – Glass, Plate, Sheet, Figured (flat, for glazing, mirrors and other uses).

1.2.2 PT-S-00230C – Sealing Compound, Synthetic Rubber Base, Single Component, Chemical Curing for Caulking, Sealing and Glazing in Building Construction.

1.2.3 NAAMM No. SS-1B-68 – Non-skinning, Resilient Preformed Compounds – Tapes, Ribbons, Beads with Release Paper.

1.2.4 ANSI Z97.1.

1.2.5 FGMA – Flat Glass Marketing Association.

1.2.6 16 CFR 1201.

1.2.7 Chapter 24, Part 2, Title 24, California Building Code, 2007.

1.2.8 NFPA 80.

1.3 SUBMITTALS

1.3.1 Submit manufacturer's standard size samples of glass units to be used for review by Architect.

1.3.2 Submit manufacturer's literature and pertinent technical data on the products to be installed. Submit two (2) samples of glass units.

1.3.3 Prepare and submit a schedule of glass and glazing components.

1.3.3.1 Schedule tapes, gaskets, separators and related items including the designation of areas and specific locations where materials and products are to be used, special instructions on their use and installation, and show scheduled items on shop drawings.

1.3.3.2 Provide detailed instructions for the installation and reglazing of glass units. Include with instructions and explanatory details, the sequence of installation, method of installation for materials and products including the glass, glazing gaskets, setting blocks, jamb blocks, etc., location of specific items such as the setting blocks and jamb blocks and special instructions as may be required.

1.3.4 Certifications:

1.3.4.1 Certify that the following materials and products and processes conform to these Contract Documents and submit in accordance with other sections of these specifications:

1.3.4.1.1 Sealants

1.3.4.1.2 Neoprene, nylon, etc.

1.3.4.1.3 Glass

1.3.4.1.4 Compatibility of materials, finishes, methods of application

1.4 QUALITY ASSURANCE

1.4.1 Glass Performance:

1.4.1.1 The maximum overall size, minimum thickness, and type of glass is to conform to the applicable glass manufacturer's published recommendations for the openings or sizes indicated on the drawings, and the performance requirements specified in these specifications.

1.4.1.2 Ensure that glass and glazing components conform to governing codes and regulations.

1.4.1.3 Design glass to perform to a specified safety factor of 2.5, and sustain at maximum wind loading a statistical glass breakage of no more than eight (8) lights in 1,000.

1.4.2 Be responsible for correction selection of glass including required accommodations for fire access, conditions of thermal stress, venting, wind loading and other factors which can be reasonably by inferred from the drawings and location of the project.

1.4.3 Safety Glazing: Install glass in accordance with the requirements of the Consumer Products Safety Commission regulation CPSC 16 CFR 1201.

1.5 DELIVERY, STORAGE, AND HANDLING

1.5.1 Take reasonable precautions necessary to provide complete protection of glass and glazing materials before, during and after installation.

1.5.2 In event of damages or breakage, repair or replace damaged and defective materials and products to the satisfaction of the Owner within five (5) calendar days.

1.6 GUARANTEE

- 1.6.1 Furnish written guarantee covering work of this Section for five (5) years from date of substantial completion. Under the terms of this guarantee, failures shall be repaired or replaced to satisfaction of the Architect and Owner without additional cost to the Owner. Under the guarantee, failures except vandalism and malicious mischief shall be repaired at no additional cost to Owner.

PART 2 – PRODUCTS

2.1 MATERIALS

- 2.1.1 Interior Float Glass: 1/4-inch thick tempered unless otherwise noted, tempered in all door lights and all interior windows. "Clear Glass" by PPG Industries, or "Clear, Select" by Libbey-Owens-Ford Company.
- 2.1.2 Fire Rated Glass: 5/16-inch (8 mm) thick premium grade FireLite Plus per U.L. File No. R13377, supplied by Technical Glass Products (800) 426-0279. Each piece of Firelite Plus shall be permanently labeled with the Firelite logo, U.L. logo and fire rating. Fire rated glazing supplier shall provide all required frame system components to ensure a complete fire rated assembly. Glass shall be approved for use where safety glazing is required by Code and shall meet CBC Chapter 24, Table 24-D and ANSI Z97.1, 2007.
- 2.1.3 Wire Glass: 1/4-inch thick polished wire plate bearing UL label, square patterned, clear, as manufactured by one of the following:

<u>Manufacturer</u>	<u>U.L. Number</u>
AFG Industries, Kingsport, TN 33662	R2129(N)
Guardian Industries, Northville, MI 48167	R32(N)
Sentinel Enterprises, Miami, FL 33137	R11084(N)

- 2.1.4 Exterior Tinted Float Glass: 1/4-inch thickness tempered at all door lights. At all exterior windows and where required per Title 24. Provide PPG 1 inch thick Solarban 60 insulating glass units consisting of two (2) pieces of 1/4 inch tinted glass with a 1/2-inch air space and bonded together. Tint shall be from PPG Industries Solarbronze and/or Solargray and/or Solargreen with a shading coefficient of 0.32 to 0.36 or greater. The outside glass shall be tinted and the inside glass shall be clear.
- 2.1.5 Acoustical: 3/8-inch thick tempered, laminated to 3/8-inch tempered, 0.060-inch interlayer.

2.2 GLAZING

- 2.2.1 Sealants:
- 2.2.1.1 Tremco, General Electric, and Dow Corning sealant products are approved where use is documented and in accordance with the use and conditions of this project.
- 2.2.1.2 Compatibility and sequence of installation for sealants is to be carefully considered in design to ensure that required cure and optimum performance are met.

- 2.2.1.3 Do not use sealants that degrade or fail under design conditions including, thermal movement (expansion and contraction), sanding water, ultra-violet exposure, aging, and other adverse time and environmental conditions.
- 2.2.1.4 Structural Sealants: Provide Tremco, "Spectrum II", G.E. or Dow Corning "745", or equal, approved sealant and Dow Corning "1200 RTC4V" primer or equal. Ensure acceptance by manufacturer of product or system of construction into which glass and sealant is being installed.
- 2.2.1.5 Color: To be selected by Architect.
- 2.2.1.6 Test sealants in accordance with ASTM C794.
- 2.2.1.7 Perform field adhesion tests in accordance with manufacturer's printed recommendations.
- 2.2.1.8 Glazing Putty: NFPA-80, paintable.
- 2.2.2 Spacers: Provide extruded silicone shims, 60-70 Type A durometer.
- 2.2.3 Setting Blocks: Provide neoprene 80 to 90 Type A durometer hardness type.
- 2.2.4 Tape: Provide Tremco 440 tape, or other approved.
- 2.2.5 Neoprene Glazing Gaskets and Air Seals:
 - 2.2.5.1 Provide glazing gaskets which are extruded type with continuous interlocking projection to engage into the metal glass holding member, are designed to be in contact at times with adjacent contiguous elements during dynamic loading, building thermal movements, and provide a continuous water tight seal as required to meet the performance criteria.
 - 2.2.5.2 Roll-in and back-up gaskets are to be sized in lengths or units to provide for a minimum crowd-in of 1 percent to 2 percent, or as otherwise recommended by manufacturer, to ensure against pullback at corners.
 - 2.2.5.3 Roll-in glazing and back-up gaskets for one (1) lite or glazed opening is to be continuous one-piece units with factory fabricated injection molded corners free of flashing and burrs.
 - 2.2.5.4 Materials, recommendations and details describing the proposed use, design, and application procedures for glass and glazing materials are to be documented and fully described on shop drawings.
 - 2.2.5.5 Air seal gaskets are to be continuous, closed-cell (sponge) neoprene gaskets with pressure sensitive adhesive on one side in thickness and shore durometer hardness as required for the specified criteria.
- 2.2.6 Provide compound for fire-rated materials in strict accordance with manufacturer's instructions.

2.3 SOURCE QUALITY CONTROL

- 2.3.1 Glass units are to be tongless edged, best quality, sizes and thickness required by drawings or conditions.
- 2.3.2 Glass and related glass and glazing materials will be verified and coordinated with the performance requirements and be as recommended, in writing, by the applicable glass and gasket manufacturers. The type, size, thickness and design of glass units, including dimensions, tolerances, glazing pockets, jamb and seismic blocking, glass edge clearance and frame lap, will be verified and documented.

Note: The selection of the glass will take into special account the performance requirements herein specified.

- 2.3.3 The edge treatment of butt glazed shall be as required to insure the full adhesion and performance of the butt glazed sealant joint and shall be as recommended in writing by the applicable glass, sealant and gasket manufacturers.
- 2.3.4 Where wire glass or fire assembly is scheduled, glaze in accordance with U.L. Building Materials, page 28A. Glazing putty compound shall be per NFPA 80-6.

PART 3 – EXECUTION

3.1 INSTALLATION

- 3.1.1 Remove lacquer and other coatings from glazing rabbets. Thoroughly clean areas to receive glass and glazing materials. The installation shall be in strict accordance with recommendations of window, glass and sealant manufacturers. Glass shall be installed so that no metal-to-glass contact occurs.
- 3.1.2 Installation shall be in accordance with applicable requirements of the latest edition of the "Glazing Manual" of the Flat Glass Marketing Association. Where vinyl or neoprene glazing beads or channels are used, they shall be in one (1) piece for each edge of glass, with corners neatly mitered and tightly fitted together.
- 3.1.3 Glass shall be cut to size in the shop. Glass shall have clean-cut edges as defined by PPG Industries Technical Service Report No. 104C. Other edges will not be accepted.
- 3.1.4 Glass in aluminum frames unless otherwise specified shall be "dry-glazed" using neoprene glazing channels and snap-on beads furnished by manufacturer. Channels shall be installed so that no metal-to-glass contact occurs. Corners shall be neatly mitered to hairline joint. Channels shall be installed so that top of channel is flush with top of glazing stops and forms a neat, straight line.
- 3.1.5 Before the shop or field pre-glazing of the curtainwall units, openings will be checked to see that they are square, plumb and in true plane. If found otherwise, glazing will not proceed until proper corrections are made.
- 3.1.6 Perimeter clearance must be sufficient to avoid point loading and provide for jamb and seismic blocking.

3.2 TEMPERED GLASS UNITS

3.2.1 Do not field cut or drill tempered glass units. Cut to proper size in factory.

3.2.2 Vertical tempering will not be allowed.

3.3 MIRRORS

3.3.1 Install mirrors in accordance with Drawings. Size 48 inches wide by 96 inches high unless noted otherwise on the drawings. Provide DOW 11 Mastic or other approved for adhesive application. Provide channel at top and bottom of mirror into which bottom is to rest, and at least four brackets for mechanical attachment around perimeter of mirror.

3.3.2 Mirror shall be minimum ¼ inch thick tempered with flat polished edges. All mirror panels shall be butt joint mirror finish shall have a 50 year warrantee for not silvering.

3.3.3 Frameless mirror panels shall be as manufactured by Art Concepts – FM102 frameless flat polish edge or equal.

3.4 FIELD QUALITY CONTROL

3.4.1 Testing: Upon completion of installation of glass and glazing, perform water tests in accordance with industry standards for such tests, and ASTM E331, AAMA FC-1, and NAAMM. Repair leaks and re-test. Continue with tests and repairs or replacements until such time as entire installation has been tested and certifiably exhibits no water intrusion, thereby instituting five (5) year guarantee against such water intrusion.

3.5 CLEANING

3.5.1 Immediately prior to scheduled acceptance of work, remove protective materials and clean glass members, being careful not to use abrasive or harmful cleaning agents.

3.6 PROTECTION

3.6.1 Maintain glass in a reasonable clean condition during construction so that it will not be damaged by corrosive action and will not contribute (by wash-off) to the deterioration of glazing materials and other surfaces.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 08 Section "Flush Wood Doors".
2. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
3. Division 08 Section "Door Hardware".
4. Division 09 Sections "Exterior Painting" and "Interior Painting" for field painting hollow metal doors and frames.

C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.

14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
 1. Elevations of each door design.
 2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 4. Locations of reinforcement and preparations for hardware.
 5. Details of anchorages, joints, field splices, and connections.
 6. Details of accessories.
 7. Details of moldings, removable stops, and glazing.
 8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
 1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
 1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
 2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
 3. Smoke Control Door Assemblies: Comply with NFPA 105.

- a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 COORDINATION

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

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
 - 1. CECO Door Products (C).
 - 2. Curries Company (CU).

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
 - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
 - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
 - 3. Manufacturers Basis of Design:
 - a. CECO Door Products (C) - DU Series.
- C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.4 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
 - 3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.5 LOUVERS

- A. Metal Louvers: Unless otherwise indicated provide louvers to meet the following requirements.
 - 1. Blade Type: Vision proof inverted V or inverted Y.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.
- B. Louvers for Fire Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire protection rating of 1-1/2 hours and less.
 - 1. Manufacturers: Subject to compliance with requirements, provide louvers to meet rating indicated.
 - 2. Metal and Finish: Galvanized steel, 0.040 inch thick, factory primed for paint finish with baked enamel or powder coated finish. Match pre-finished door paint color where applicable.

2.6 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.7 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.8 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
 - 1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
 - 2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
 - 3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
 - 4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
- D. Hollow Metal Frames:
 - 1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
 - 3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
 - 5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
 - 6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
 - 7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
 - 8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 - 9. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

- 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
 - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
 10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
 11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.9 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.
 - 1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
 - 4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Standard Steel Doors:

- a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
- b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
- c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
- d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION 081113

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 commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Sliding doors.
 - 3. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section "Hollow Metal Doors and Frames".
 - 2. Division 08 Section "Flush Wood Doors".
 - 3. Division 08 Section "Aluminum-Framed Entrances and Storefronts".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Proof of Compliance: (California located Projects): Provide a list of product(s) containing chemicals known to cause cancer or reproductive toxicity as defined by the Office of Environmental Health Hazard Assessment (OEHHA) under Proposition 65 (CA Code of Regulations, Title 27, Section 27001). The list includes the specific chemical(s), if the chemical will be exposed to consumers, the means of warning, and an illustration of the label.
- E. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
- E. California Building Code: Provide hardware that complies with CBC Section 11B.
 - 1. All openings as a part of an accessible route shall comply with CBC Section 11B-404.
 - 2. The clear opening width for a door shall be 32" minimum. For a swinging door it shall be measured between the face of the door and the stop, with the door open 90 degrees. There shall be no projections into it below 34" and 4" maximum projections into it between 34" and 80" above the finish floor or ground. Door closers and stops shall be permitted to be 78" minimum above the finish floor or ground. CBC Section 11B-404.2.3.
 - 3. Operable hardware on accessible doors shall comply with CBC Section 11B-309.4 and shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. Operable parts of such hardware shall be 34" minimum and 44" maximum above finish floor or ground. Where sliding doors are in the fully open position, operating hardware shall be exposed and usable from both sides.
 - 4. Hardware (including panic hardware) shall not be provided with "nightlatch" function for any accessible doors or gates unless the following conditions are met:
 - a. Such hardware has a 'dogging' feature and is dogged during the time the facility is open.
 - b. All 'dogging' operation is performed only by employees as their job function (non-public use).
 - 5. The force for pushing or pulling open a door shall be in accordance with CBC Section 11B-404.2.9.

- a. Interior hinged doors, sliding or folding doors, and exterior hinged doors: 5 pounds (22.2 N) maximum. Required fire doors: the minimum opening force allowable by the DSA authority, not to exceed 15 pounds (66.7N). These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.
 - b. The force required for activating any operable parts, such as lever hardware, or disengaging other devices shall be 5 pounds (22.2N) maximum to comply with CBC Section 11B-309.4.
- 6. Door closing speed shall comply with CBC Section 11B-404.2.8. Closers shall be adjusted so that the required time to move a door from an open position of 90 degrees to a position of 12 degrees from the latch is 5 seconds minimum. Spring hinges shall be adjusted so that the required time to move a door from an open position of 70 degrees to the closed position is 1.5 seconds minimum.
- 7. Floor stops shall not be located in the path of travel and 4" maximum from walls.
- 8. Thresholds shall comply with CBC Section 11B-404.2.5.
- F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.
- D. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.

- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 2. Twenty five years for manual surface door closer bodies.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

- a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
- 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
- 4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
- 5. Manufacturers:
 - a. Bommer Industries (BO) - LB Series.
 - b. McKinney Products; ASSA ABLOY Architectural Door Accessories (MK) - TA Series.

2.3 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 - 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 - 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 - 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 - 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 - 5. Keyway: Match Facility Standard. Match Facility Restricted Keyway.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
 - 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
 - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 3. Existing System: Field verify and key locks to match Owner's existing system.
- E. Key Quantity: Provide the following minimum number of keys:
 - 1. Change Keys per Cylinder: Two (2)
 - 2. Master Keys (per Master Key Level/Group): Five (5).

3. Construction Keys (where required): Ten (10).
- F. Construction Keying: Provide temporary keyed construction cores.
- G. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 2. Provide transcript list in writing or electronic file as directed by the Owner.
- H. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.
1. Manufacturers:
 - a. Lund Equipment (LU).
 - b. MMF Industries (MM).
 - c. Telkee (TK).
 - I. Key Control Software: Provide one network version of "Key Wizard" branded key management software package that includes one year of technical support and upgrades to software at no charge. Provide factory key system formatted for importing into "Key Wizard" software.

2.4 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.
1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
 2. Locks are to be non-handed and fully field reversible.
 3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 2 million cycles.
 4. Manufacturers:
 - a. Sargent Manufacturing (SA) – 10 Line.

2.5 AUXILIARY LOCKS

2.6 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.7 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Manufacturers:
 - a. Sargent Manufacturing (SA) - 351 Series.
 - b. No Substitution.

2.8 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, .050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.9 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.10 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
 - 1. Pemko Products; ASSA ABLOY Architectural Door Accessories (PE).
 - 2. Reese Enterprises, Inc. (RE).

2.11 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.12 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection (Punch-Out Report): Reference Division 01 Section "Closeout Procedures". Final inspect installed door hardware and state in report whether work complies with or deviates from specification requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. 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.
- B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

Hardware Sets

Set: 1.0

Doors: [PDC1](#), [PDC2](#), [PDC4](#), [SMB1](#), [WHAA - D101](#), [WHAA - D102](#), [WHAA - D103](#), [WHAA - D104](#)

Description: Sgle - Office Lock - Reg/Par Closer - W/F Stop

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Entry/Office Lock	10G05 LL	US26D	SA
1 Surface Closer	351 H / PH9 as Required	EN	SA
1 Kick Plate	K1050 10" high CSK	US32D	RO
1 Wall Stop	403 (or) 441CU (As Required)	US26D	RO
1 Threshold	270A		PE
1 Gasketing	S88BL		PE
1 Door Bottom	411APKL		PE

Set: 2.0

Doors: [PDC3](#)

Description: Sgle - Office Lock - Reg/Par Closer - W/F Stop

3 Hinge, Full Mortise	TA2714	US26D	MK
1 Classroom Security Lock	10G38 LL	US26D	SA
1 Surface Closer	351 H / PH9 as Required	EN	SA
1 Kick Plate	K1050 10" high CSK	US32D	RO
1 Wall Stop	403 (or) 441CU (As Required)	US26D	RO
1 Gasketing	S88BL		PE
1 Door Bottom	411APKL		PE

END OF SECTION 087100

PART 1 - GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specifications sections which apply to work of this section as if printed herein.

- 1.1 SECTION INCLUDES: Description of requirements for material, fabrications and installation of all Gypsum Board, including Trim, Joint Treatment as shown on drawings and necessary to complete the work. Work shall include primarily but is not limited too:

1.1.1 Gypsum board.

1.1.2 Joint treatment and surface finishes.

- 1.2 N.A.

- 1.3 RELATED SECTIONS:

1.3.1 Section 061000 – Rough Carpentry.

1.3.2 Section 099100 – Painting.

- 1.4 REFERENCES AND STANDARDS:

1.4.1 ASTM C 36 – Gypsum Wallboard.

1.4.2 ASTM E 119 – Fire Tests of Building Construction and Materials.

1.4.3 Gypsum Association, “Levels of Gypsum Board Finish”.

1.4.4 Submit shop drawings and product data under provisions of Section 013300.

1.4.7.1 Provide shop drawings illustrating system and component dimensions, components within assembly, framed opening requirements and tolerances, anchorage and fasteners; glass and infills; and affected related work.

1.4.7.2 Provide, where required, shown or specified, custom modifications to manufacturers or referenced standard, including material gauge, anchorage, dimension, and fabrication criteria.

1.4.7.3 Provide manufacturer's installation instructions and listing requirements.

1.4.5 Samples: Provide on 12-inch square sample of each type of door, cut at corner, showing edge treatment and core material.

- 1.5 REGULATORY REQUIREMENTS:

1.5.1 Conform to Chapter 25, Part 2, CBC for gypsum board and plaster.

- 1.6 QUALITY ASSURANCE:

1.6.1 Manufacturer: Provide company who has produced the specified products for a period of five (5) years prior to beginning work of this Section and maintains the capability to provide the specified products in compliance with the delivery and quantity criteria for the Project.

- 1.6.2 Installer: For installation of work, use only personnel who are thoroughly trained and experienced in the skills required, have installed similar applications of the specified products within one (1) year prior to beginning work of this Section, and who are completely familiar with the manufacturers' recommended method of installation as well as the requirements of this work.
- 1.6.3 Industry Standards: Materials and workmanship shall comply with requirements of American Standards Association, Standards Specifications for Gypsum Wallboard Finish, A97.1; and Recommended Specifications of the Gypsum Association for the Application and Finishing of Gypsum Board, GA-216, latest Edition, except where more detailed or more stringent requirements are indicated, including recommendations of manufacturer. Work shall also comply with requirements of 2013 CBC, Title 24, Part 2, Chapter 25.
- 1.6.4 Allowable Tolerances: 1/8 inch offsets between planes of board faces. Wall surfaces shall not vary more than 1/8 inch in 10 feet 0 inches from required plane. Corners shall be square, straight, and plumb.
- 1.6.5 Surface Acceptance: The Painting Contractor shall not be required to accept the gypsum wallboard installation until after he has applied sealer. At that time, he shall inspect the installation and report to the General Contractor, with a letter to the Architect, of any surface damage, defects or uneven walls. Uneven walls shall mean those that are not straight, plumb or an even true plane.
- 1.7 JOB CONDITIONS:
 - 1.7.1 Delivery: All material shall be delivered in original packages or bundles with the manufacturer's labels intact and legible.
 - 1.7.2 Handling and Storage: Materials shall be kept dry, stacked off the ground and properly supported and protected from weather. Protect all edges and surfaces. Stack wallboard neatly and flat.
- 1.8 ENVIRONMENTAL CONDITIONS:
 - 1.8.1 Environmental: Do not install wallboard and joint compounds if building temperature is below 40 degrees F and joint compounds if building temperature is below 55 degrees F and proper ventilation is not provided to eliminate excessive moisture from building.
- 1.9 SUBMITTALS:
 - 1.9.1 Provide submittals under provisions of Section 013300. Submit 2 by 2 sample of finished texture.
 - 1.9.2 Submit product data indicating materials, joint toppings and finish materials, and accessories.
 - 1.9.3 Submit manufacturer's installation instructions.

PART 2 – PRODUCTS

2.1 GYPSUM BOARD:

- 2.1.1 Manufacturer: United States Gypsum (USG) or equal

2.1.1.1 Provide the same manufacturer for all like products.

2.1.2 Board Type:

2.1.2.1 Non-Rated: USG Regular per ASTM C36

2.1.2.1.1 Edge: SW Tapered

2.1.2.1.2 Thickness: 5/8 inch

2.1.2.1.3 Maximum Permissible Length

2.1.2.2 Fire Rated: USG FireCode Core (Type X) per ASTM C36

2.1.2.2.1 Edge: SW Tapered

2.1.2.2.2 Thickness: 5/8 inch (1/2 inch where shown on drawings.)

2.1.2.3 Water Resistant: USG Water Resistant FireCode Core, Type X, per ASTM C 630

2.1.2.3.1 Edge: SW Tapered

2.1.2.3.2 Thickness: 5/8 inch

2.2 ACCESSORIES:

2.2.1 Acoustical Sealant: USG, Non-hardening, non-skinning, conforming to ASTM C 557 and C 919, for use in conjunction with non-rated gypsum board assemblies.

2.2.2 Drywall Joint and Edge Accessories:

2.2.2.1 Corner Bead: USG No. 104.

2.2.2.2 Edge Trim: USG Series 200 or approved alternate, metal.

2.2.2.3 Expansion Joint: USG 093 or approved alternate, metal.

2.2.2.4 Metal Casing: USG No. 200B.

2.2.2.5 "J" Edge USG No. 400, GA 201 ORGA 216.

2.2.3 Joint and Finishing Systems:

2.2.3.1 Provide systems produced by same manufacturer as boards.

2.2.3.2 Joint Systems: USG Ready Mixed Compounds, complying with ASTM C 475, vinyl based, certified asbestos free.

2.2.3.3 Finishing System Materials: USG Multi-Purpose or approved alternate, complying with ASTM C 475, non aggregate, vinyl based, certified asbestos free.

2.2.3.4 Primer: Manufacturers approved primer, compatible with finishes specified in other Sections.

2.2.4 Fasteners:

2.2.4.1 Gypsum board screws: type and length as required by installation and UL Listing criteria.

2.2.4.2 Cementitious Backer Unit Screws: corrosion resistant, type and length as required by manufacturer, installation and UL Listing criteria. Nails not permitted.

2.3 OTHER MATERIALS:

2.3.1 Provide all other materials, not specifically described but required for complete and proper installation of this work, as selected by the Contractor and subject to the approval of the Architect.

2.3.1.1 For purpose of establishing required level of quality, characteristics of products manufactured by Anemostat are specified.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS:

3.1.1 Inspection

3.1.1.1 Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

3.1.1.2 Verify that work of this section may be installed in strict accordance with the original design, all pertinent codes and regulations, and all pertinent portions of the referenced standards.

3.1.1.2.1 Verify framing members are properly installed and will comply with specified tolerances.

3.1.1.2.2 Verify that openings, curbs, pipes, sleeves, ducts, and vents are solidly set, and blocking and backing are in place.

3.1.1.3 In the event of discrepancy, immediately notify the Architect.

3.1.1.4 Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 PREPARATION:

3.2.1 Insulation Coordination:

3.2.1.1 Verify insulation is fitted tightly within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and to items passing through partitions.

3.2.1.2 Install insulation specified in this section as a component in rated floor/ceiling and roof/ceiling systems.

3.3 GYPSUM BOARD INSTALLATION:

- 3.3.1 Install gypsum board in accordance with manufacturer's instruction and designated system number for fire rated assemblies.
 - 3.3.1.1 Unless noted otherwise, utilize water resistant type for wall surfaces within 4 feet of the outermost edge of any plumbing fixture or moisture generating equipment. Extend water resistant gypsum board full height.
 - 3.3.1.2 Do not use water resistant gypsum board on ceiling applications.
- 3.3.2 Use screws of proper length when fastening gypsum board to framing, spaced at 8 inches on center maximum at each support.
- 3.3.3 Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
- 3.3.4 Treat cut edges and holes in moisture resistant gypsum board with sealant.
- 3.3.5 Edge and Trim Installation:
 - 3.3.5.1 Install corner beads at all external corners. Use longest practical length.
 - 3.3.5.2 Install corner beads at all conditions where gypsum board abuts dissimilar materials.
 - 3.3.5.3 Install angle reinforcement at interior corners.
 - 3.3.5.4 Tape and finish joint reinforcement as specified.
- 3.3.6 Install acoustical sealant at wall edge perimeter, including floor edge, and at all penetrations where fire stopping is not required.

3.4 GYPSUM BOARD FINISH AND JOINT TREATMENT:

- 3.4.1 Pre-fill all joints with approved mortar. Tape all joints and level.
- 3.4.2 Comply with descriptions and Finish Levels as specified and in accordance with reference standard.
 - 3.4.2.1 LEVEL 2 Finish: Gypsum board located above ceiling areas, plenums, and similar surfaces not visible in completed construction.
 - 3.4.2.2 Embed tape at all joints and interior angles in joint compound.
 - 3.4.2.3 Apply one (1) separate coat of joint compound over all joints, angles fastener heads, and accessories.
- 3.4.3 LEVEL 4 Finish: Gypsum board designated to receive vinyl wall covering.
 - 3.4.3.1 Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
 - 3.4.3.2 Embed tape at all joint and interior angles in joint compound.

3.4.3.3 Apply three (3) separate coats of joint compound over all joints, angles, fastener heads, and accessories.

3.4.4 LEVEL 4 Finish - Orange Peel: Gypsum board surfaces receiving paint finish.

3.4.4.1 Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.

3.4.4.2 Embed tape at all joint and interior angles in joint compound.

3.4.4.3 Apply three (3) separate coats of joint compound over all joints, angles, fastener heads, and accessories. Apply approved primer.

3.4.4.4 Apply texture coating over entire surface. Finish in "Orange Peel" texture as illustrated in USG Construction Handbook. Surface shall be smooth and free of tool marks and ridges.

3.5 TOLERANCES:

3.5.1 Comply with the following tolerances for level, plumb, and flat. Where substrate framing will not comply with specified tolerances, correct deficiencies as required.

3.5.1.1 Level and Plumb: Plus or minus ¼ inch in 10 feet, non-cumulative.

3.5.1.2 Flatness: No gaps exceeding 1/8 inch at any point under a 10-foot straight edge placed on surface in any orientation.

3.5.2 Fire-Rated Conditions:

3.5.2.1 Preserve continually of fire rating.

3.5.2.2 Provide fire-rated enclosures for electrical outlets and junction boxes, lighting fixtures, recessed cabinets, fixtures, and other items requiring same.

3.5.2.3 Where adjacent interior spaces have suspended ceilings of different heights, extend separating partition finish on both faces of studs to at least 3 inches above higher ceiling finish.

3.5.2.4 Conform to applicable codes and authorities for requirements of taping and cementing joints and fasteners heads.

3.5.3 Moisture Resistant Gypsum Board: Location as shown on plans including but not limited to toilets, kitchens, and sink locations, lab areas, wet work rooms, etc.

3.6 ADJUST AND CLEAN:

3.6.1 Touch-up: Prior to surface sealer and painting decoration, surface damage and other defects shall be repaired and/or touched-up. Repairs and touch-up shall not be obvious.

3.6.2 Cleaning and Repair: Clean surfaces (including work of other trades) that have been spotted or soiled during wallboard application. Upon completion of work, remove all surplus material, rubbish, and debris from the premises and leave the floors broom clean.

3.6.3 Defective Work: Remove and replace defective work which cannot be satisfactorily repaired, at the direction of the Architect, with no additional cost to the Owner.

- 3.6.4 Protection: Protect installed gypsum board work against damage from other construction work.

END OF SECTION

PART 1 - GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specifications sections which apply to work of this section as if printed herein.

1.1 WORK INCLUDED:

1.1.1 Work includes acoustical panels for installation in ceiling suspension systems.

1.2 RELATED WORK:

1.2.1 Related Work Specified Elsewhere:

1.2.1.1 Section 095300 – Acoustical Tile Suspension Systems.

1.3 QUALITY ASSURANCE:

1.3.1 Installer's Qualifications: In accordance with the requirements of Section 095300.

1.3.2 Regulatory Requirements:

1.3.2.1 Comply with applicable codes and regulations of governmental agencies having jurisdiction.

1.3.2.2 Where requirements of applicable codes, regulations and standards conflict with this specification, comply with the more stringent provisions.

1.3.3 Source Quality Control:

1.3.3.1 Tests: Materials for which physical characteristics have been stipulated shall have had such characteristics independently confirmed by laboratory tests employing industry recognized procedures. Both the laboratory performing the tests and the test methods employed will be subject to the approval of the Architect.

1.4 SUBMITTALS:

1.4.1 Product Data: Submit complete manufacturer's descriptive literature and specifications in accordance with the provisions of Section 013300.

1.4.1.1 Materials List: Submit complete list of materials proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item where applicable.

1.4.1.2 Manufacturer's Recommendations: Submit the manufacturer's current recommended methods of installation.

1.4.2 Shop Drawings: In accordance with the requirements of Section 095300.

1.4.3 Samples: In accordance with the provisions of Section 013300, submit samples of acoustical lay-in panels proposed for use.

- 1.4.4 Test Reports: When and as directed by the Architect, submit certified laboratory test reports confirming physical characteristics of materials used in the performance of the work of this section.
- 1.4.5 Other Submittals:
 - 1.4.5.1 Extra Stock: Provide 2 percent of each type of ceiling panel; provide full size panels only in original appropriately labeled cartons.
- 1.5 DELIVERY, STORAGE, AND HANDLING:
 - 1.5.1 Protection: Use all means necessary to protect the materials of this section before, during, and after installation.
 - 1.5.1.1 Deliver materials to job site in original unopened containers with labels intact stating manufacturer's name, style, lot number and other pertinent data.
 - 1.5.2 Replacements: In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS

- 2.1 ACCEPTABLE MANUFACTURERS:
 - 2.1.1 Design is based on the use of products manufactured by Armstrong Ceiling System 1-888-CEILINGS.
 - 2.1.2 Materials shall be the products of one (1) manufacturer and shall be either the ones upon which the design is based or the products of a manufacturer approved as an equal.
- 2.2 MATERIALS:
 - 2.2.1 Provide acoustical lay-in panels conforming to FS SS-S-118B for Class A and having the following characteristics:
 - 2.2.1.1 NRC Range: 0.75.
 - 2.2.1.2 Acoustical Class: 170
 - 2.2.1.3 Light Reflectance: LR-1. (0.86).
 - 2.2.1.4 Fire Rating: Class A
 - 2.2.1.5 Smoke Developed Index: 50 or less
 - 2.2.1.6 Surface Finish: Factory applied vinyl latex paint.
 - 2.2.2 Design is based on the use of the following:
 - 2.2.2.1 Lay-in tile Fine Fissured-High NRC No. 1755 24 inches by 48 inches by 5/8 inch thick.
 - 2.2.3 Axiom Transition Strips: Aluminum extrusion, depth according to plans

2.3 OTHER MATERIALS:

- 2.3.1 Other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and subject to approval of the Architect.

PART 3 - EXECUTION

3.1 INSPECTION:

- 3.1.1 Prior to commencing the work of this section, carefully inspect previously installed work and verify that such work is complete to the point where this installation may properly commence.
- 3.1.2 Verify that work of this section may be installed in accordance with applicable codes, regulations and standards, the Contract Documents and the approved submittals.

3.2 PREPARATION:

- 3.2.1 Protection: Protect previously installed work and materials which may be affected by the work of this section.

3.3 INSTALLATION:

- 3.3.1 Install work in strict accordance with the manufacturer's submittals and recommendations, as approved.

3.3.1.1 Install work in conjunction with the work of Section 095100.

3.4 ADJUSTING AND CLEANING:

- 3.4.1 Clean exposed surfaces of acoustical ceilings, including edge moldings. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

PART 1 - GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specifications sections which apply to work of this section as if printed herein.

1.1 REFERENCE:

- 1.1.1 Requirements in Addenda, Alternates, Conditions, and Division 1 collectively apply to this work.

1.2 DESCRIPTION:

1.2.1 Principal Work Items Are:

- 1.2.1.1 Metal suspension systems for:

- 1.2.1.1.1 Acoustic tile ceilings.

1.2.2 Related Work Specified Elsewhere:

- 1.2.2.2 Section 061000 – Rough Carpentry.

- 1.2.2.3 Section 092116 – Gypsum Board.

- 1.2.2.4 Section 095100 – Acoustical Ceilings.

1.3 SUBSTITUTIONS:

- 1.3.1 Only written approval of the Architect of Record and/or District will permit substitutions for materials specified.

1.4 QUALITY ASSURANCE:

- 1.4.1 Design Criteria: Suspension system to limit deflection of finished ceiling to 1/360 of span or less.

- 1.4.2 Allowable Tolerance: 1/8 inch maximum permissible variation from true plane measured from 10 feet straight edge placed on finished ceiling surface.

1.4.3 Requirements of Regulatory Agencies:

- 1.4.3.1 Conform to CCR Titles 24, and UBC, specifically Chapter 25A, which refers to Underwriters' Laboratory Tunnel Test for fire hazard classification of building materials.

- 1.4.3.2 Structural: Per Title 24, in particular with all integrated ceiling assemblies being designed brace systems as a minimum standard; and any additional requirements specified herein or shown.

- 1.4.4 Allowable Tolerance: 1/8 inch maximum permissible variation from true plane measured from 10 feet straight edge placed on finished ceiling surface.

- 1.4.5 Reference Standards: Acoustical Materials:

1.4.5.1 Acoustical and Insulating Materials Association (AIMA) Bulletin "Performance Data for Architectural Acoustic Materials".

1.4.5.2 Federal Specifications SS-S-118A, Sound Control Blocks and Board (Acoustical Tiles and Panels, Prefabricated).

1.5 SUBMITTALS:

1.5.1 Samples; In Duplicate:

1.5.1.1 Lay-in panels, 12 inches by 24 inches minimum size.

1.5.1.2 Suspension Grid System: Assembled sample to show all typical members, connections, splices, and wall angle, and colors.

1.5.2 Shop Drawings:

1.5.2.1 Submit for all work; reference to Architect's detail numbers; seven (7) copies.

1.5.2.2 Show complete Drawing layouts and installation details for all this work, accurately to scale.

1.5.2.3 Show related work of other Sections which is installed in, attached to, or penetrates ceiling areas, such as: air distribution devices, electrical devices, and fire sprinklers.

1.5.3 Product Data: Submit catalog cuts or manufacturer's printed literature; seven (7) copies in accordance to Section 013300.

1.5.3.1 Printed data for all suspension grid system components, including load tests.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING:

1.6.1 Delivery: Deliver all materials to site in original sealed packages; manufacturer, brand, and product clearly identified thereon.

1.6.2 Storage: Store materials in building area where they will be installed, in original packaging. Keep clean and free from damage due to water or deteriorating elements.

1.6.3 Handle so as to prevent damage during storage and installation.

1.7 JOB CONDITIONS:

1.7.1 Environmental Requirements: Maintain temperature in spaces at 55 degrees F or above for 24 hours before and after, and all during application of materials.

1.7.2 Sequencing, Scheduling:

1.7.2.1 Before concealing work of other Sections, ascertain that required inspections of such work have been made.

1.7.2.2 Coordinate with related work of other Sections. Coordinate location and symmetrical placement of air distribution devices, electrical devices, fire sprinklers, and all penetrations with appropriate Section.

1.8 GUARANTEE:

- 1.8.1 General: Two (2) year guarantee for all work. Refer to Specifications Section 017700, Contract Close-Out.

PART 2 – PRODUCTS

2.1 MATERIALS; Wire:

- 2.1.1 General: Galvanized, soft-annealed steel wire; Federal Specifications QQ-W-461, Class 1; US wire gauges; gauges where shown.
- 2.1.2 Hanger Wire; 12 gauge wire minimum for maximum supported areas for 16 SF, heavier gauges where shown.
- 2.1.3 Bracing Wire: 12 gauge wire minimum, heavier gauges where shown.

2.2 MATERIALS; Suspension Grid:

2.2.1 Acceptable Manufacturers and Products:

- 2.2.1.1 Donn Ceiling Systems, Type DX by USG Inc., as standards of quality, or Chicago Metallic Corp., Los Angeles, California.

- 2.2.1.2 Other Manufacturers: Refer to Paragraph 1.3.1.

- 2.2.2 Standards: Grid and connections per Section 3, ASTM C635-69, Heavy Duty 16lbs., deflection 1/360 of span in 4 feet.

2.2.3 Grid System:

- 2.2.3.1 Type: DX System, Exposed Steel Grid by Donn Ceiling Systems, modified as required and permitted by DSA.

- 2.2.3.2 Grid Members, Suspended Acoustical Lay-In Ceiling:

- 2.2.3.3 Main Runners: No. DX-26, 1-1/2 inches high by 15/16 inches wide.

- 2.2.3.4 Cross-Tees: No. DXO-424, 1-1/2 inches high by 15/16 inches wide.

- 2.2.3.5 Splices: No. DX-20.

- 2.2.3.6 Wall Moldings: M-7.

- 2.2.3.7 Finish: Baked vinyl enamel finish coats; factory applied to cleaned and boulderized members, matte finish typical.

- 2.2.4 Compression Struts: "C" Shaped metal studs, 20 gauge, per DSA requirements.

2.2.5 Screws:

- 2.2.5.1 Standards; UBC Standard 47-5 (which is based on ASTM C646).

- 2.2.5.2 Type: Self-drilling, self-tapping, bugle head, No. 6; Type S to metal framing. Lengths to penetrate through metal and ¼ inch minimum projection beyond.

2.3 MATERIALS: Acoustical Tile

2.3.1 Acceptable Manufacturer

- 2.3.1.1 Armstrong Manufacturer Ceiling Tile. See Section 095100 – Acoustical Ceilings for Ceiling Tile types and sizes.

PART 3 – EXECUTION

3.1 INSPECTION:

- 3.1.1 Examine framing and other work which supports or abuts integrated and luminous ceiling areas.
- 3.1.2 Examine location and placement of air distribution devices, electrical devices, fire sprinklers, and all other penetrations for proper alignment with required layouts.
- 3.1.3 Do not start work until unsatisfactory conditions are corrected.

3.2 PREPARATION:

3.2.1 General:

- 3.2.1.1 System to be complete: all joints neatly and tightly joined and securely fastened; grid members hung in a true, flat, level plane.
- 3.2.1.2 Hanger Wires: No. 12 typically, larger sizes as indicated.
- 3.2.1.2.1 Wires exceeding 1:6 out of plumb shall be braced with counter-sloping wires.
- 3.2.1.2.2 Keep wires 6 inches minimum clear of unbraced ducts, pipes and other items.
- 3.2.1.2.3 Install wire within 8 inches of ends of all main runners and cross-tees at ceiling perimeters.
- 3.2.1.2.4 Where obstructions prevent direct suspension, provide approved trapezes or equivalent devices; 1-1/2 inches minimum cold rolled channels back to back may be used for spans to 6 feet maximum.
- 3.2.1.2.5 Wire to be straight, without extraneous kinks or bends.
- 3.2.1.3 Bracing wires to resist seismic forces: No. 12 typically, larger sizes as indicated.
- 3.2.1.3.1 Systems for bracing ceiling which do not support demountable partitions; Install one four-wire set of sway-bracing wires for each 144 SF maximum of ceiling area. Locate wire sets at 12 feet maximum on center. At ceiling perimeters, wire sets must be within 6 feet of walls.

- 3.2.1.3.2 Locate four (4) wire sets within 2 inches of cross runner intersection with main runner; space wires 90 degrees from each other.
- 3.2.1.3.3 Do not install sway bracing wires at an angle greater than 45 degrees with the ceiling plane.
- 3.2.1.3.4 Wires to be taut without causing ceiling to lift.
- 3.2.1.4 Provide all additional wires, No. 12 minimum, necessary to properly support grid at electrical devices, air distribution devices, vertical soffits, and other concentrated loads.
- 3.2.1.5 Grid:
 - 3.2.1.5.1 Grid members may be attached to two adjacent walls; but must be ½ inch minimum clear of other walls.
 - 3.2.1.5.2 Any grid members not attached to walls shall be interconnected to prevent spreading, near their free end, with a horizontal metal strut or 16-gauge taut tie wire.
 - 3.2.1.5.3 Provide additional tees or sub-tees to frame openings for lights, air distribution devices, electrical devices, and other items penetrating through ceiling, which do not have an integral flange to support and conceal cut edges of acoustic panels. Provide cross-bracing necessary to securely support any surface mounted fixtures or other items.
- 3.2.1.6 Attachment of wires:
 - 3.2.1.6.1 To wood joist or framing members: As indicated.
 - 3.2.1.6.2 To grid member: Insert through holes in members or supporting clips.
 - 3.2.1.6.3 All wires to be fastened with tight turns; three tight turns minimum for hanger wires; four tight turns minimum for bracing wires. All turns to be made in a 1-1/2 inch maximum distance.
- 3.2.1.7 Grid System for Suspended Acoustical Ceiling Areas:
 - 3.2.1.7.1 Main Runners: Space main runners in pair 12 inches on center maximum along runners, and within 8 inches of ends.
 - 3.2.1.7.2 Install wall moldings.
 - 3.2.1.7.3 Cross-Tees: Install between main runners in as repetitive pattern of 1 foot and 2 feet spacings as shown.
 - 3.2.1.7.4 Sub-Trees: Install at edges of all penetrations per Paragraph A5c.
 - 3.2.1.7.5 Bracing Wires: Install as specified in Subparagraph 3.02 A 3a for Systems for Bracing Ceilings which do not support Demountable Partitions.
 - 3.2.1.7.6 Color: White for all members.

3.3 ADJUSTMENT:

3.3.1 Check for level, adjust, complete all connections and panel clips.

3.3.2 Cleaning: Clean soiled spots from acoustic panels and all work.

3.3.3 Replace damaged work.

END OF SECTION

PART 1 – GENERAL:

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specifications sections which apply to work of this section as if printed herein.

1.1 SUMMARY

1.1.1 Work includes complete preparation and finishing of all surfaces as indicated in the plans and specifications except surfaces specifically excluded.

1.1.2 Surfaces not to be painted unless otherwise specified:

1.1.2.1 Aluminum, Copper, Brass, Stainless Steel, Nickel or Chrome.

1.1.2.2 Finish hardware.

1.1.2.3 Acoustical ceilings.

1.1.2.4 Flooring.

1.1.2.5 Electrical fixtures and receptacles.

1.1.2.6 Exterior concrete pavements.

1.1.2.7 Toilet compartments and accessories.

1.1.2.8 All items with complete factory finish, except mechanical and electrical items as specified herein.

1.1.2.9 Code required labels, equipment identification and performance rating plates.

1.1.2.10 Items in mechanical rooms.

1.1.2.11 Other surfaces as indicated on the drawings.

1.1.3 Related Work:

1.1.3.1 Section 092116 - Gypsum Board

1.1.3.2 Section 081113 – Hollow Metal Doors and Frames

1.2 SUBMITTALS

1.2.1 Submit six (6) copies of a complete list of all materials proposed for use in the work, including manufacturer's technical data, identified by manufacturer's name and product number.

1.2.2 Submit for approval three (3) 8-½ inch by 11 inch samples of each color and finish. For natural and stained finishes, provide samples on type and quality of wood used on the product. Identify each sample as to color, finish type, and texture. Color shall be as selected by the Architect.

1.3 QUALITY ASSURANCE

-
- 1.3.1 Work, equipment and materials must conform to applicable Federal, State, and Local laws and regulations, including compliance with all air quality regulations applicable to the project location. Current manufacturer's material safety data sheets for all materials in use and/or stored at the project site must be on the site at all times.
 - 1.3.2 Prepare sample wall areas as directed by the Architect. These areas will represent the standard of work for the project when approved.
 - 1.4 DELIVERY, STORAGE, AND HANDLING
 - 1.4.1 All materials shall be of the brand and quality specified and shall be delivered at the project site in clean, original, unopened, labeled containers bearing the manufacturer's name, type of paint and instructions for mixing and/or reducing.
 - 1.4.2 Store materials as designated. Storage area shall be kept clean and neat at all times. All damage to storage area and surrounding areas shall be cleaned and repaired to new condition.
 - 1.4.3 Rags, waste and combustible rubbish shall be stored in approved metal containers and removed daily from site. Take all necessary precautions to prevent fire.
 - 1.4.4 Provide 1 gallon of paint for each type/color of paint used for extra stock.
 - 1.5 PROJECT SITE CONDITIONS
 - 1.5.1 Measure moisture content of surfaces using an electronic moisture meter. Do not apply materials unless moisture contents are below the following maximums:
 - 1.5.1.1 Plaster – 8 percent
 - 1.5.1.2 Gypsum Board – 12 percent
 - 1.5.1.3 Masonry, Concrete and Concrete Block – 12 percent
 - 1.5.1.4 Wood – 15 percent
 - 1.5.2 Ensure surface temperature fall within recommendations of the material manufacturer.
 - 1.5.3 Do not apply materials during fog, rain or mist, or when inclement weather is expected within the dry time specified by the manufacturer.
 - 1.6 SEQUENCING AND SCHEDULING
 - 1.6.1 Backpriming of all wood items to be set against concrete, masonry or plaster shall be performed, scheduled and coordinated to avoid delays in installation.
 - 1.6.2 Priming of walls scheduled to receive wall covering shall be performed and scheduled to facilitate dry time prior to wall covering installation.
 - 1.7 MAINTENANCE
 - 1.7.1 Provide Owner with unopened, clearly labeled containers of each type and color of finish material installed for maintenance use. Quantities provided shall be a minimum of 2 percent of quantities actually applied, but not less than 1 gallon each.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- 2.1.1 Materials necessary to complete the painting and finishing schedule as specified herein are taken from the stock list of the Architectural finishes of Vista Paint Corporation (no substitution), and are standards for kind, quality and function.

2.2 MATERIALS

- 2.2.1 All materials shall conform to specified standards of quality and shall be of fresh stock, unused, free of defects and imperfections. Where two (2) or more identical or compatible materials are required, they shall be of the same manufacture.
- 2.2.2 Materials shall be ready-mixed except field catalyzed coatings. Field tinting of materials will not be permitted.
- 2.2.3 Materials shall have good flowing and brushing characteristics and dry or cure free from streaks or sags.
- 2.2.4 Paint accessory materials such as putty, spackle, thinners, reducers and shellacs shall be of the highest quality and fully compatible with the specified materials.

PART 3 – EXECUTION

3.1 EXAMINATION

- 3.1.1 Thoroughly examine surfaces scheduled to be painted prior to commencement of work. Report in writing to the Architect any condition that may potentially affect proper application and appearance. Do not commence until such defects in have been corrected.
- 3.1.2 Where directed by the Architect, correct defects in surfaces which may adversely affect work of this section.

3.2 PROTECTION

- 3.2.1 Protect unpainted surfaces, lawns, shrubbery and adjacent surfaces against paint and damage. Repair damage resulting from inadequate protection.
- 3.2.2 Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or splatter from foul surfaces not being painted.
- 3.2.3 Remove electrical plates, surfaces hardware and related fittings prior to commencement of work. Carefully store, clean and replace these items on completion of work in each area.
- 3.2.4 Protect all surfaces, equipment and fixtures from damage resulting from use of fixed, movable and hanging scaffolding, planking, and staging. Repair damage resulting from inadequate protection.

3.3 PREPARATION

- 3.3.1 Concrete surfaces shall be dry, clean and free from efflorescence, encrustations and other foreign matter. Any glazed surface shall be slightly roughened or etched. Curing

compounds, bond breakers, release agents and other coatings shall be removed with a light sandblast or high pressure power wash.

- 3.3.2 Remove dirt, loose mortar, scale, powder and other foreign matter from concrete block surfaces which are to be painted or treated with a clear sealer.
- 3.3.3 Remove mildew from affected surfaces with a solution of Tri-Sodium Phosphate and bleach.
- 3.3.4 Rinse with clean water and allow to dry completely.
- 3.3.5 Remove all oils and contamination from galvanized and aluminum surfaces scheduled to be painted by washing with mineral spirits.
- 3.3.6 Remove grease, rust, scale, dirt, and dust from ferrous metal surfaces. Prime coating shall be performed not less than 30 minutes, not more than 3 hours after preparation.
- 3.3.7 Sand and scrape shop primed metal to remove loose primer and rust. Touch up bare, abraded and damaged areas with 910 Red Oxide Primer. Feather edges to make touch up patches inconspicuous.
- 3.3.8 Remove dust, grit and foreign matter from wood surfaces. Sand surfaces and dust clean. Spot coat knots, pitch streaks and sappy section with 4200 Terminator II when surfaces are to be painted. Fill nail holes, cracks and other defects after priming and spot prime repairs when fully cured.
- 3.3.9 Plaster surfaces shall be dry and free from efflorescence, encrustations and foreign matter. Fill cracks, holes and imperfections, smoothing repairs to match adjacent texture. Allow repairs to fully cure before priming.

Gypsum drywall shall be dusted clean and free from encrustations and other foreign matter.
- 3.3.10 Existing surfaces to be recoated shall be thoroughly cleaned and deglossed by sanding or other means prior to priming and painting. Patched and bare areas shall be spot primed with the same paint as specified for new work.
- 3.3.11 Preparation of other surfaces shall be performed following specific recommendations of the coating manufacturer.

3.4 APPLICATION

- 3.4.1 All work shall be executed in strict accordance with manufacturer's printed directions for materials used. Use application equipment and techniques best suited for substrate and type of material being applied.
- 3.4.2 All materials shall be applied smoothly without runs, sags, skips, holidays or other defects.
- 3.4.3 Enamels and varnishes shall be lightly sanded between coats, dusted and wiped clean before recoating.
- 3.4.4 Back prime all wood to be set against concrete, masonry or plaster.
- 3.4.5 Allow each coat to dry completely before applying succeeding coat.

- 3.4.6 Each coat of paint is to be slightly darker than preceding coat unless otherwise approved by the Architect.
- 3.4.7 Number of coats specified are minimum that shall be applied. Additional coats shall be applied when undercoats, strains, cloudy or mottled conditions or other defects appear in the finish, until the paint film is of a uniform finish, color and appearance.

3.5 INSPECTION

- 3.5.1 All work shall be subject to approval by the Architect. Work not in compliance with specifications shall be properly and promptly corrected.

3.6 PROTECTION

- 3.6.1 Provide "Wet Paint" signs, barricades and other items required to protect newly finished surfaces. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
- 3.6.2 At the completion of work of other trades, touch-up and repair all damaged and defaced surfaces.

3.8 FINISHING SCHEDULE – INTERIOR

DRYWALL – GYPSUM – WALLBOARD

SEMI-GLOSS:

First Coat	1100	Hi-Build PVA Sealer (100% Acrylic)
Second Coat	8400	Carefree Semi-Gloss (100% Acrylic)
Third Coat	8400	Carefree Semi-Gloss (100% Acrylic)
First Coat	6000	Earth Coat Primer (100% Acrylic)
Second Coat	6400	Earth Coat Semi-Gloss (100% Acrylic)
Third Coat	6400	Earth Coat Semi-Gloss (100% Acrylic)

GLOSS:

First Coat	1100	Hi-Build PVA Sealer (100% Acrylic)
Second Coat	8500	Carefree Gloss (100% Acrylic)
Third Coat	8500	Carefree Gloss (100% Acrylic)

First Coat	1100	Hi-Build PVA Sealer
Second Coat	8500	Carefree Gloss
Third Coat	8500	Carefree Gloss

(Industrial Use Only)

First Coat	1100	Hi-Build PVA Sealer
Second Coat	5900	Protec (Alkyd)
Third Coat	8500	Protec (Alkyd)

WOOD

FLAT:

First Coat	088 OR 188	Enamel Undercoater
Second Coat	8100	Acrylic Primer Carefree Flat (100% Acrylic)

Third Coat	8100	Carefree Flat (100% Acrylic)
	OR	
	188	Acrylic Primer
Second Coat	8200	Carefree Velva Sheen (100% Acrylic)
Third Coat	8200	Carefree Velva Sheen (100% Acrylic)
EGGSHELL:		
First Coat	088	Enamel Undercoater
	OR	
	188	Acrylic Primer
Second Coat	8000	Carefree Eggshell (100% Acrylic)
Third Coat	8000	Carefree Eggshell (100% Acrylic)
SEMI-GLOSS:		
First Coat	088	Enamel Undercoater
	OR	
	188	Acrylic Primer
Second Coat	8400	Carefree Semi-Gloss (100% Acrylic)
Third Coat	8400	Carefree Semi-Gloss (100% Acrylic)
GLOSS:		
First Coat	088	Enamel Undercoater
	OR	
	188	Acrylic Primer
Second Coat	8500	Carefree Gloss (100% Acrylic)
Third Coat	8500	Carefree Gloss (100% Acrylic)
First Coat	088	Enamel Undercoater
Second Coat	8500	Carefree Gloss
Third Coat	8500	Carefree Gloss
(Industrial Use Only)		
First Coat	088	Enamel Undercoater
Second Coat	5900	Protec (Alkyd)
Third Coat	5900	Protec (Alkyd)
<u>METAL: FERROUS – IRON – STEEL</u>		
FLAT:		
First Coat	999	Metal Prime White
Second Coat	4500	Galva-Poxy White
Third Coat	8100	Carefree Flat (100% Acrylic)
LOW SHEEN:		
First Coat	999	Metal Prime White
Second Coat	4500	Galva-Poxy White
Third Coat	8200	Carefree Velva Sheen (100% Acrylic)
EGGSHELL:		
First Coat	999	Metal Prime White
Second Coat	4500	Galva-Poxy White
Third Coat	8000	Carefree Eggshell (100% Acrylic)
SEMI-GLOSS:		
First Coat	999	Metal Prime White

Second Coat	4500	Galva-Poxy White
Third Coat	8400	Carefree Semi-Gloss (100% Acrylic)

GLOSS:

First Coat	999	Metal Prime White
Second Coat	4500	Galva-Poxy White
Third Coat	7900	Premogloss (100% Acrylic)

First Coat	999	Metal Prime White
Second Coat	9000	Proformer
Third Coat	9000	Proformer

First Coat	999	Metal Prime White
Second Coat	5900	Protec
Third Coat	5900	Protec

METAL: NON-FERROUS – GALVANIZED – ALUMINUM

FLAT:

First Coat	999	Metal Prime White
Second Coat	4500	Galva-Poxy White
Third Coat	8100	Carefree Flat (100% Acrylic)

LOW SHEEN:

First Coat	999	Metal Prime White
Second Coat	4500	Galva-Poxy White
Third Coat	8200	Carefree Velva Sheen (100% Acrylic)

EGGSHELL:

First Coat	4500	Galva-Poxy White
Second Coat	4500	Galva-Poxy White
Third Coat	8000	Carefree Eggshell (100% Acrylic)

SEMI-GLOSS:

First Coat	4500	Galva-Poxy White
Second Coat	4500	Galva-Poxy White
Third Coat	8400	Carefree Semi-Gloss (100% Acrylic)

GLOSS:

First Coat	4500	Galva-Poxy White
Second Coat	4500	Galva-Poxy White
Third Coat	7900	Premogloss (100% Acrylic)

First Coat	999	Metal Prime White
Second Coat	9000	Proformer
Third Coat	9000	Proformer

First Coat	999	Metal Prime White
Second Coat	5900	Protec
Third Coat	5900	Protec

END OF SECTION

PART 1 – GENERAL:

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specification sections which apply to work of this section as if printed herein.

1.1 WORK INCLUDED:

1.1.1 Work Includes:

- 1.1.1.1 Room identification system
- 1.1.1.2 Required informational signs).
- 1.1.1.3 Site signage.

1.2 RELATED WORK:

1.2.1 Related Work Specified Elsewhere:

- 1.2.1.1 Section 033000 – Concrete Work: Footings for signs.
- 1.2.1.2 Section 042200 – Masonry Concrete Block
- 1.2.1.3 Section 054000 – Lightgauge Structural Framing.
- 1.2.1.4 Section 092113 – Lath and Plaster.
- 1.2.1.5 Section 092116 – Gypsum Board.

1.3 QUALITY ASSURANCE:

1.3.1 Regulatory Requirements:

- 1.3.1.1 Comply with applicable codes and regulations of the Title 24 Code of Regulations and A.D.A. (Americans with Disabilities Act) requirements.
- 1.3.1.2 Where requirements of applicable codes, regulations and standards conflict with this specification, comply with the more stringent provisions.

1.4 SUBMITTALS:

1.4.1 Product Data: Submit complete manufacturer's description literature and specifications in accordance with the provisions of Section 013300.

1.4.1.1 Materials List: Submit complete lists of materials and equipment proposed for use, giving the manufacturer's name, catalog number, and catalog cut for each item where applicable.

1.4.1.2 Manufacturer's Recommendations: Submit the manufacturer's current recommended methods of installation.

1.4.2 Samples: In accordance with the provisions of Section 013300, submit manufacturer's standard palette for the selection of colors and metal finishes.

1.5 DELIVERY, STORAGE, AND HANDLING:

- 1.5.1 Protection: Use all means necessary to protect the materials of this section before, during, and after installation.
- 1.5.2 Replacements: In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

- 2.1.1 Design is based on the use of products manufactured by Mohawk Systems, Schenectady, NY (518) 370-3433.
- 2.1.2 Materials shall be the product of one (1) manufacturer and shall be either the ones upon which the design is based or the products of a manufacturer approved in accordance with Section 012513. Contractor to furnish and install all signs.
 - 2.1.2.1 Vomar Products, Inc., Canoga Park, CA (818) 610-5115.
 - 2.1.2.2 ASI Sign Systems, Los Angeles, CA (310) 8645-1400.

2.2 MATERIALS:

- 2.2.1 General: Arrange the required letters, numbers and figures with uniform margins, in the letter style and size as selected by the Architect from manufacturer's standard.
- 2.2.2 Plastic Sign Plates: Comply with A.D.A. and Title 24.
 - 2.2.2.1 All signage shall conform to CBC Sections 11B-603.2.3, 11B-703 and 1011. Tactile exit signage shall be provided per CBC 11B-703.1.
 - 2.2.2.1.1 **Character Type**: Characters on signs shall be raised 1/32 inch (0.794 mm) minimum and shall be sans serif uppercase characters accompanied by Grade 2 Braille (see Note 5 below).
 - 2.2.2.1.2 **Character Size**: Raised characters shall be a minimum of 5/8 inch (15.9 mm) and a maximum of 2 inches (51 mm) high.
 - 2.2.2.1.3 **Finish and Contrast**: Contrast between characters, symbols and their background must be 70 percent minimum and have a non-glare finish. CBC 11B-703.5.1.
 - 2.2.2.1.4 **Proportions**: Characters on signs shall have a width-to-height ratio of between 3:5 and 1:1 and a stroke width-to-height ratio of between 1:5 and 1:10. CBC 11B-703.2.4.

All letters measured must be uppercase. After choosing a typestyle to test, begin by printing the letters **I**, **X** and **O** at 1 inch height. Place the template's 1:1 square over the **X** or **O**, whichever is narrower. If the character is not wider than 1 inch, nor narrower than the 3:5 rectangle, the proportions are correct. Use the 1:5 rectangle to determine if the stroke of the **I** is too broad, and the 1:10 rectangle to see if it is too

narrow. If all the tests are passed, the typestyle is compliant with proportion code.

2.2.2.1.5 California Contracted Grade 2 Braille shall be used whenever Braille is required in other portions of these standards. Dots shall be spaced 1/10 inch (2.54 mm) on center in each cell, with 2/10 inch (5.08 mm) space between cells, measured from the second column of dots in the first cell to the first column of dots in the second cell. Dots shall be raised a minimum of 1/40 inch (0.635 mm) above background. CBC Section 11B-703.3.

2.2.2.2 All signage shall conform to CBC Sections 11B-703 and 1011.

2.2.2.3 Letter or numbers shall be raised 1/32-inch upper case Helvetica accompanied by contracted Grade 2 Braille. Letters and number sizes shall be from 1 inch to 6 inches as listed below.

2.2.2.3.1 Door room identification name and number plates at 1 inch.

2.2.2.3.2 Occupancy size 2 inch letters.

2.2.2.3.3 Main building signs 18 inch letters.

2.2.2.3.4 Exit signs shall be 5/8 inch minimum to 2 inches maximum letters.

2.2.2.4 All signs shall be anchored to the surface by vinyl tape mounting-VTM and minimum four (4) non-removable screws.

2.2.2.5 All permanent identification shall be installed on the wall adjacent to the latch side of the door. These signs shall be installed at 60 inches from finished floor to center line of sign.

2.2.2.6 Color(s) Black Background with White Lettering and or Numbering.

2.2.3 Text and Location:

2.2.3.1 Room Names: All doors shall have room name signs. Use Finish Schedule as a guide. Actual room names will be verified by the District after construction begins.

2.2.3.2 Door Numbers: All interior and exterior doors shall have numbers. Use the same number on all doors from one space into the other space; from the door schedule. Actual room numbers will be furnished to the Contractor by the District after construction begins. Assume an average of four (4) numerals for each door.

2.2.3.3 Fire Extinguisher Identification: Red, with 1-3/4 inch high, white letters. Height of sign 2 inches by required length. Furnished by the Contractor and Contractor to install.

2.2.3.3.1 Signs shall read: "FIRE EXTINGUISHER."

2.2.3.4 Occupancy Signs: Brown, with 1 1/2 inch high white letters.

- 2.2.3.4.1 Text: "OCCUPANCY ##### PERSONS". Verify actual number with Architect. Height and length of sign as required. Provide a minimum of 12 occupancy signs unless noted otherwise on the drawings. Provide one occupancy sign at each science classroom lab.
- 2.2.3.5 Miscellaneous Signs and Symbols: As required by code.
 - 2.2.3.5.1 Disabled symbols for toilet room doors per Title 24 Section 11B-213.2 and A.D.A. requirements.
 - 2.2.3.5.1.1 Men: 12 inch triangle pictogram with the disabled wheelchair symbol.
 - 2.2.3.5.1.2 Women: 12 inch diameter pictogram disc with disabled wheelchair symbol.
 - 2.2.3.5.2 Non-illuminated EXIT signs per CBC requirements.
- 2.2.3.6 Exterior Gate Signs: All gates shall have a sign mounted on fence adjacent to gate.
 - 2.2.3.6.1 Sign shall read: "This gate shall remain unlocked during school hours".
- 2.2.3.7 Painted Graphic Signage At All Exterior Face of Buildings: Paint the word Building followed by the building number on outside surface of exterior. Provide a set of four (4) sets for each building. Painting to be done by brush and not with stencils and spray. Provide minimum 2 coats of paint. Lettering to be in Helvetica Bold Style from 12 inches to 18 inches high letters. See floor plans for text number.
- 2.2.4 All Disabled exterior signage shall be of blue or white background with blue or white graphic, letter, symbol and logo. Disabled striping shall be painted code blue (Fed Blue Color 15090, Fed Std. 595C).
- 2.2.5 Disable Directional signs or Warning signs: Provide minimum of disable directional signs as note unless noted otherwise on the drawings. Size of sign shall be as detailed on the drawings and all signs noted shall be wall mounted signs.
- 2.2.6 Assistive Listening Device: Provide signs indicating availability of assistive listening devices in compliance with Section 11B-219, Part 2, Title 24, CBC and ADAAG 4.30.7. In addition, provide message on sign stating "CONTACT SCHOOL ADMINISTRATION TO MAKE ARRANGEMENTS FOR ACCESS TO LISTENING DEVICE FOR USE AFTER SCHOOL HOURS". Provide Five (5) signs, located as directed by Architect.
- 2.3 WALL MOUNTED SIGNS:
 - 2.3.1 Secure wall-mounted signs to walls with theft-proof fasteners, centered at interior end of parking space with bottom edge of sign a minimum of 36 inches above finished grade unless noted otherwise on the drawings. Fasten into concrete with self-drilling masonry anchors, Phillips Redhead, Bulldog, Rawl Sabertooth, or equal.
- 2.4 OTHER MATERIALS:

- 2.4.1 Other materials, not specifically described but required for a complete and proper installation of the work of this section, shall be new, first quality of their respective kinds, and subject to approval of the Architect.

PART 3 – EXECUTION

3.1 INSPECTION:

- 3.1.1 Examine the substrates and conditions under the specialty signs which are to be installed and remedy any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION:

- 3.2.1 Install sign units and components at the locations shown or scheduled, securely mounted with adhesive mounting system and screws, unless otherwise indicated. Attach signs to substrates in accordance with manufacturer's instructions.

- 3.2.2 Install level, plumb, and at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by the Architect.

3.2.2 Permanent room, directional and informational signage:

- 3.2.2.1 Install signs after substrate surfaces receive final finish.
- 3.2.2.2 Center room identification signage at 60 inches above floor, located on strike side of door or as directed by Architect.
- 3.2.2.3 Where signs are installed in sealant method on glass panels, provide back plate matching sign at opposite side of glass.
- 3.2.2.4 When sign is installed on window surface or other similar recessed conditions, provide spacer as required to maintain sign face within 3 inches of outermost wall plane.

3.2.3 Exterior site, directional and informational signage:

- 3.2.3.1 Mount at locations as shown on Drawings, level and plumb.
- 3.2.3.2 Coordinate location with Architect.
- 3.2.3.3 Mount wall mounted signage fasteners in sealant bedding.
- 3.2.3.4 Where signs are mounted on gate or fence mesh, sandwich mesh between sign and backing panel of same material and size as sign. Install using sex bolt, tamper resistant fasteners, mounted through aluminum sleeve/spacer.

3.2.4 Exterior letters and signs:

- 3.2.4.1 Mount at locations as shown on drawings, level and plumb.
- 3.2.4.2 Mount wall mounted signage fasteners in sealant bedding.

- 3.2.4.3 Coordinate location with Architect.
- 3.2.4.4 Clean and polish all signage after installation.

END OF SECTION

PART 1 - GENERAL

All applicable portions of Division 1, including the drawings and general provisions of the contract, the general and supplementary conditions and Division 1 specification sections which apply to work of this section as if printed herein.

- 1.1 SECTION INCLUDES: Description of requirements for materials, fabrications and installation of Fire Fighting Devices where shown on Drawings, as specified herein, and as needed for a proper installation. Work to include, but not be limited to the following:

1.1.1 Section Includes: Fire extinguishers as indicated on the Drawings and specified herein.

- 1.2 RELATED WORK:

1.2.1 Section 061000 – Rough Carpentry.

1.2.3 Section 092116 – Gypsum Wallboard.

- 1.3 SUBMITTALS:

1.3.1 Provide materials list of items proposed to be provided.

1.3.2 Submit data sufficient to demonstrate compliance with specifications and drawing requirements.

1.3.3 Submit shop drawing and catalog cuts of items to be provided. Manufacturer or producer's standard drawings and technical information may be acceptable where complete enough to determine acceptability.

1.3.4 Submit samples of products and materials where options of color, finish, pattern, or texture exist.

- 1.4 QUALITY ASSURANCE:

1.4.1 Products and materials to be provided are to be from manufacturers and producers regularly engaged full-time in the manufacture or production of this and similar items, with a history of successful manufacture or production acceptable to the Owner.

1.4.2 In addition to complying with pertinent codes and regulations, comply with industry and trade standards normally associated with this product or material, except where specified product or material is superior in quality to industry and trade standards.

1.4.3 Comply with the requirements from the C.F.C. and Title 19, CBC, NFPA No. 10.

- 1.5 DELIVERY, STORAGE, AND HANDLING:

1.5.1 Deliver products and materials to the project and store in a safe, dry place with shop-supplied protection and labeling intact and legible until set, applied, or installed.

1.5.2 Use reasonable means necessary to protect products and materials before, during, and after installation.

1.5.3 In event of damage, regardless of responsibility and culpability, make repairs and

replacements necessary to satisfaction of Owner, and at no additional cost to Owner.

1.6 WARRANTY:

- 1.6.1 Provide Owner with a written warranty as a condition of work acceptance, signed by Contractor and Installer (where applicable), agreeing to maintain, repair and/or replace products and materials for one (1) year following acceptance, and without additional cost to Owner.

PART 2 – PRODUCTS:

2.1 MATERIALS:

- 2.1.1 Fire Extinguisher Cabinets: Larson Architectural, Model 2409-SM, for surface mount unit, and Model 2409-R4 with rolled edge for semi-recessed unit, by Potter-Roemer or J.L. Industries. Tempered safety glass with stainless steel frame. Provide pressure sensitive die cut letters, 1-inch high reading:

FIRE EXTINGUISHER

Small instruction letters reading:

"In Case of Fire, Break Glass and Open Door from Inside"

- 2.1.2 At all fire extinguishers, provide surface mounted bracket, at a height of 33 inches to 44 inches, with retainer straps. Larsen's Model 846, or equal.

PART 3 – EXECUTION:

3.1 INSTALLATION:

- 3.1.1 Install equipment in strict accordance with manufacturer's instructions.
- 3.1.2 Install equipment 4.0 feet maximum to the top of the fire extinguisher handle.

3.2 CLEANING:

- 3.2.1 Keep areas clean during entire operation and leave spaces broom clean.
- 3.2.2 After completion, clean up and remove resultant debris from the site.

END OF SECTION