

satisfy the requirements of AISC for the complete fastener assembly, including lubrication if required to be used in the work, (2) calibration of wrenches, if applicable, and (3) the understanding and proper use by the bolting crew of the method to be used. The frequency of confirmation testing, the number of tests to be performed and the test procedure shall be as specified in 1.d. below, as applicable. The accuracy of the tension measuring device shall be confirmed through calibration by an approved testing agency at least annually.

- c. Joint Assembly and Tightening of Shear/Bearing Connections: Bolts in connections not within the slip-critical category shall be installed in properly aligned holes, but need only be tightened to the snug tight condition. The snug tight condition is defined as the tightness that exists when all plies in a joint are in firm contact. This may be attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench. If a slotted hole occurs in an outer ply, a flat hardened washer or common plate washer shall be installed over the slot.
- d. Joint Assembly and Tightening of Connections Requiring Full Pre-tensioning. Slip-critical connections shall be installed in properly aligned holes and tightened by one of the following methods.
 - 1) Turn-of-nut Tightening: When turn-of-nut tightening is used, hardened washers are not required except as specified in the AISC. A representative sample of not less than three bolts and nuts of each diameter, length and grade to be used in the work shall be checked at the start of work in a device capable of indicating bolt tension. The test shall demonstrate that the method of estimating the snug-tight condition and controlling turns from snug tight to be used by the bolting crews develops a tension not less than five percent greater than the tension required for slip-critical connections.
 - 2) Installation of Alternate Design Bolts: A representative sample of not less than three bolts of each diameter, length and grade shall be checked at the job site in a device capable of indicating bolt tension. The test assembly shall include flat hardened washers, if required in the actual connection, arranged as in the actual connections to be tensioned. The calibration test shall demonstrate that each bolt develops a tension not less than five percent greater than the tension required by AISC. Manufacturer's installation procedure shall be followed for installation of bolts in the calibration device and in all connections. When alternate design features of the fasteners involve an irreversible mechanism such as yield or twist-off of an element, bolts shall be installed in all holes of the connection and initially brought to a snug tight condition. All fasteners shall then be tightened, progressing systematically from the most rigid part of the connection to the free edges in a manner that will minimize relaxation of previously tightened fasteners prior to final twist-off or yielding of the control or indicator element of the individual fasteners. In some cases, proper tensioning of the bolts may require more than a single cycle of systematic tightening.
- e. Mark bolts that have been completely tightened with an identifying symbol.

3.03 WELDING

- A. General: Quality of materials and design and fabrication of all welded connections shall conform to AISC "Specifications for the Design, Fabrication and Erection of Structural Steel

for Building," "AWS Code for Welding in Building Construction," and requirements of this section.

Location and type of all welds shall be as shown. Make no other welded splices, except those shown on drawings, without prior approval of the architect.

- B. Automatic Welding: Use electrode wire and flux for automatic and semi-automatic welding acceptable to Structural Engineer. All methods, sequences, qualification and procedures, including preheating, and post heating if necessary, shall be detailed in writing and submitted to the Structural Engineer for review.
- C. Qualification of Welders:
 - 1. Structural steel welding: Manual and automatic welds for structural steel construction shall be made only by operators who have been previously qualified by tests, as prescribed in AWS D1.1 to perform type of work required.
 - 2. Welders shall be checked by welding inspector. Those not doing satisfactory work may be removed, and may be required to pass qualification tests again. All qualification testing shall be at the Contractor's expense.
 - 3. Only welders whose weld procedures and pre-qualification by testing that have passed shall be considered qualified for such welds.
- D. Control cooling process after weld is completed by either step down post heat or thermal blankets as determined by procedures and prequalification.
- E. Box columns and built-up members shall have ultrasonic testing before and after welding.
- F. Flame cut surfaces shall be ground to remove contaminated steel layer to provide welds proper fusion without impurities.
- G. Preparation of surface: Surfaces to be welded shall be free of loose scale, slag, rust, grease, paint, and any other foreign material.
- H. Welding equipment: Welding equipment to be used in each case shall be acceptable to welding inspector. Use equipment with suitable devices to regulate speed, and manually adjust operating amperage and voltage. The amperage capacity shall be sufficient to overcome line drop, and to give adequate welding heat.
- I. Remove runoff tabs and grind surfaces smooth where the tabs would interfere with fireproofing and architectural finishes.
- J. End-welded studs:
 - 1. Automatic end-welded studs: Automatically end-weld in accordance with the manufacturer's recommendations in such a manner as to provide complete fusion between the end of the stud and the plates. There shall be no porosity or evidence of lack of fusion between the welded end of the stud and the plate. The stud shall decrease in length during welding approximately 1/8 inch for 5/8 inch, and 3/16 inch for 3/4 inch diameter. Stud sizes indicated on drawings represent the finish stud height.
 - 2. Fillet-end welded studs: Studs may be welded using prequalified FCAW, GMAW, or SMAW processes provided the requirements of the AWS D1.1 Chapter 7 Section 7.5.5 are met as well as any other pertinent requirements of D1.1.
- K. Provide mill camber as shown on the construction documents within AISC tolerance. Place mill tolerance upward for all beams specified no camber.

3.04 ERECTION

- A. Structural steel erection: Comply with AISC "Specification for the Design, Fabrication and Erection of Structural Steel for Building", latest edition.

- B. Erection Sequence: Erect steel in accordance with special erection sequences where special erection sequences are indicated on the contract documents.
- C. Before and during erection, keep all structural steel clean. Ship, handle and store steel in manner to avoid injury to members. Steel members showing evidence to rough handling or injury will be rejected.
- D. Mark each member with erection identification corresponding to mark shown on erection drawings. Carefully plan erection of structural steel so that no cutting and removal of material will be necessary. Do not torch burn in the field, unless specifically permitted by Engineer.
- E. Provide sufficient bracing, shoring and guys to effect safe and satisfactory erection. Provide bracing and shoring capable of holding steel work plumb and properly aligned while field connections are being made, and until lateral force resisting elements are deemed by Architect capable of bracing structure. Temporary bracing shall be adequate to resist lateral forces from wind or seismic prior to the completion of the lateral resisting system.
- F. Set bearing and base plates with extreme care. Bring level, to line and grade with leveling plates or by leveling nuts and bolts. Grout solid under plates with a flowable non-shrink grout per Section 03300 prior to applying vertical load.
- G. Field Assembly: Set structural framing accurately to the lines and elevations indicated. Align and adjust the various members forming a part of a complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces which will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

Shimming or other adjustments not indicated on drawings shall be approved by the Engineer prior to installation. Level and plumb individual members of the structure within specified AISC tolerances except as noted herein. Column shimming shall be 1/4 inch.

- H. All welds shall be full and clean, and conform to AISC and AWS specifications.
- I. Erection Tolerances: Individual pieces shall be erected so that the deviation from plumb, level and alignment shall not exceed 1 to 500 plus:
 - 1. The maximum displacement of the center line of columns adjacent to elevator shafts, from the established column line, shall not be more than 1 inch at any point.
 - 2. In order to provide a true, flat plane for the exterior elevations, install all steel framing at the exterior walls of the building, so that the center lines of such framing does not vary by more than 1 inch for the length of the building. Also install each vertical member on such grids so that its vertical center line does not vary by more than 1/2 inch from a vertical line for each story and 1 inch for its full height.
 - 3. All columns and beams shall adhere to Section M2.7 of the referenced "Specification for Structural Steel for Buildings" which states that completed members shall be free of twists, bends, and open joints. Take special care that column base plates are parallel and perpendicular to faces of columns and that bolt holes are accurately placed.
- J. Temporary Flooring:
 - 1. Provide planking and scaffolding necessary in connection with erection of structural steel, support of erection machinery, and construction materials. Temporary floors and use of steel shall be as required by applicable regulatory requirements.
 - 2. If steel decking is used as a working platform, it shall be temporarily tack-welded to supports to extent necessary for such use in accordance with applicable regulatory requirements. The concentrated loading from welding machines and other heavy machinery required for steel erection shall be distributed by planking or other approved means. Metal decking that becomes damaged as the result of being used as a working platform shall be replaced at no additional cost to the Owner.

- K. Tower Crane: The design for the support and bracing for a tower crane shall be the responsibility of the General Contractor. The design shall be prepared by a structural engineer licensed in the state of California. Drawings and calculations shall be stamped and signed by the structural engineer. Concentric, torsional, and/or eccentric loading to the main structure shall be resolved by the addition of structural steel for shear tabs, stiffeners, drag ties, bracing struts, etc., Such items shall be designed, detailed, furnished and installed by the contractor.

3.05 PAINTING AND CLEANING

- A. Prior to prime coat application, clean all loose rust, mill scale, oil, dirt, and all other materials from all steel to be left exposed. Use hand tool, power tool, sandblasting, chemical cleaning, and any other method necessary to provide a smooth, sound surface for painting.
- B. Shop prime all steel except the following:
1. Steel encased in concrete.
 2. Contact surfaces for slip-critical (sc) high strength bolts.
 3. Areas within 4 inches of field welds.
 4. Tops of members to receive metal decking.
 5. Steel to be fireproofed.
 6. Surfaces to be galvanized.
- C. Use the following Type A shop painting systems on all normal environment interior steelwork:
1. Surface Preparation: SSPC-SP2 Hand Tool Cleaning or SSPC-SP3 Power Tool Cleaning. Where jobsite exposure is expected to exceed 6 months, SSPC-SP6 Commercial Blast Cleaning is required.
 2. Application: Follow coating manufacturer's printed directions.
 3. Material: Type A Tnemec Series 88HS Azerox Primer.
 4. Number of Coats: One
 5. Dry Film Thickness: 2.0 mils minimum.
 6. Volume Solids: 60.0 +/- 2.0% minimum
 7. Generic Description: Modified Alkyd.
- D. Use the following Type B shop painting systems on all exterior steelwork and interior steelwork subjected to wet conditions or fumes:
1. Surface Preparation: SSPC-SP6 Commercial Blast Cleaning
 2. Application: Follow coating manufacturer's printed directions.
 3. Material: Type B Tnemec 90-97 Tnemec-Zinc primer
 4. Number of Coats: One
 5. Dry Film Thickness: 2.5 mils minimum.
 6. Volume Solids: 63% +/- 2%
 7. Generic Description: Organic Zinc-Rich Urethane
- E. Use the following finish painting systems on all exterior steelwork and interior steel work subjected to wet conditions or fumes:
1. Application: Follow coating manufacturer's printed directions. Apply over Type B primer system above.

2. Material: Themec Series 75 Endura-Shield paint.
 3. Number of Coats: One
 4. Dry Film Thickness: 3 to 5 mils
 5. Volume Solids: 72% +/- 2%
 6. Generic Description: Aliphatic Polyurethane
- F. Apply two shop prime coats to areas which will be inaccessible after erection.
- G. Clean contact surfaces of high strength bolts of all burrs and material which might prevent solid seating of the parts. Steel to receive bolts shall be primer painted except beneath the contact area of slip-critical bolts.
- H. After erection, field touch up all welded areas, high strength bolts and damaged areas. For all steel to remain exposed, remove all blemishes, paint drips, and touch up prime coat.

3.06 HOISTING AND BRACING

- A. Provide all hoisting and erecting equipment and power.
- B. Provide and maintain any and all safety railings, toe boards, etc., required for the erection of steel framing and metal decking.
- C. Brace the erected frame in a manner which will assure safety and proper alignment to receive the metal decking and until the concrete slabs have been poured and have set.
- D. Erect building frame true and level. Erect columns in a manner to allow for movement due to welding shrinkage and thermal expansion and contraction of framing. Check plumbness after erection of each level. Maintain structural stability of frame during erection. Provide temporary bracing where necessary to maintain frame stability and to support required loads, including equipment and its operation.

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SECTION 05500
METAL FABRICATIONS

PART 1 – GENERAL

1.01 **GENERAL REQUIREMENTS**

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 **SUMMARY**

- A. Shop fabricated metal items and miscellaneous metal work.
- B. Refer to Schedule at end of this Section.

1.03 **QUALITY ASSURANCE**

- A. Standards and References: (Latest Edition unless otherwise noted)
 - 1. 2010 California Building Code (CBC), with State of California Amendments
 - 2. American Society for Testing and Materials (ASTM) Specifications as listed in the Section.
- B. Submittals: (Submit under provisions of Article 5 of the General Conditions)
 - 1. Shop Drawings: Submit shop drawings indicating profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevation, and details where applicable. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
 - 2. Manufacturer's descriptive data: Submit for manufacturer's items.

1.04 **SUBSTITUTIONS**

Substitutions will be considered per General Condition Article 3.11.4 and Section 01630.

1.05 **SUBMITTALS**

- A. Provide in accordance with Article 3.11 of the General Conditions.
- B. Submit Product data on specified products, describing physical and performance characteristics: sizes, patterns, colors available, and method of installation.

1.06 **DELIVERY, STORAGE AND HANDLING**

- A. Adhere to requirements of Section 01640.
- B. Deliver all parts ready for erection; store in close proximity to final locations.

1.07 **CLOSE-OUT**: also comply with the requirements of Section 01770 – Contract Closeout.

- A. **Reports**:
None required.
- B. **As-Builts**:
Comply with the requirements of Section 01770 – Contract Closeout.
- C. **Operation and Maintenance Data**:
None required.
- D. **Extra Materials**:
None required.

E. Extended Warranty:

Comply with the requirements of General Condition Article 3.5 and Section 01740.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Steel Pipe: ASTM A53, Type E or S, Grade. B.
- D. Steel Bolts, Nuts, and Washers: ASTM A307.
- E. Welding Materials: AWS D1.1; type required for materials being welded.
- F. Galvanizing: Hot-dip process ASTM A123 typical and ASTM A153 for threaded fasteners performed after fabrication into largest practical section. Weight of coating not less than 2 oz. per sq. ft. of surface. Where damaged, repair surface with one coat of hot process galvanizing repair compound, "Galvalloy", Galvweldalloy", or approved equal.
- G. Primer: Tnemec Company "Series V10 Red Primer", Sherwin-Williams "Kern Primer"; or approved equal.
- H. Dissimilar Materials: Separate dissimilar surfaces in contact with or in close proximity to non-compatible metals, concrete masonry, or plaster with neoprene gasket; or other approved means.
- I. Expansion Bolts: Hilti "Kwik Bolt TZ" Expansion Anchor Bolts, galvanized unless otherwise indicated.
- J. Non-shrink Grout: Master builders 928 or equal.

2.02 FABRICATION

- A. Verify dimensions on site prior to shop fabrication.
- B. Fabricate items with joints tightly fitted and secured.
- C. Fit and shop assemble in largest practical sections, for delivery to jobsite.
- D. Grind exposed welds flush and smooth adjacent finished surfaces. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of structure, except where specifically noted otherwise.
- F. Make exposed joints butt tight, flush and hairline.
- G. Supply components required for anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise.

2.03 FINISH

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact bond with concrete or where field welding is required.
- C. Prime paint interior items with one coat unless scheduled to be galvanized.
- D. Galvanize exterior items and scheduled interior items to minimum 2.00 oz/sq ft zinc coating.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.
- E. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

- A. Obtain Architect's approval prior to site cutting or making adjustments not scheduled.
- B. Clean and strip primed steel items to bare metal where site welding is scheduled.
- C. Make provision for erection loads with temporary bracing. Keep work in alignment.
- D. Supply items required to be cast into concrete with setting templates, for installation under appropriate Sections.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Perform field welding in accordance with AWS D1.1.
- C. After installation, touch-up field welds, scratched or damaged surfaces with primer, except repair exposed galvanized work (not to be painted) with hot process field galvanizing, in accord with manufacturer's published directions.

3.04 SCHEDULE

Provide and install items listed in Schedule and shown on Drawings with anchorage and attachment necessary for installation. The following Schedule lists principal items only. Refer to drawing details for items not specifically scheduled.

- 1. Miscellaneous plates or angles not attached to structural steel; complete with anchorage for embedment.
- 2. Exterior mounted ladders.
- 3. Handrails and guardrails.
- 4. Bollards.
- 5. Gates for trash enclosure.

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SECTION 06100

ROUGH CARPENTRY

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Conditions apply to this Section.

1.02 SCOPE OF WORK

- A. Provide all labor, materials, tools, facilities and equipment required for the fabrication and installation of rough carpentry and associated items (except that which is specified elsewhere) indicated on Drawings and necessary to complete the Work. Items include, but are not necessarily limited to, the following:
1. Blocking, backing, stripping, furring, and nailers.
 2. Rough hardware.
 3. Wood framing.
 4. Wood sheathing.
 5. Preservative treatment.
 6. Drilling, saw cuts, knock-outs and framing for ventilation.
 7. Wood sheathing backing at tile walls.

1.03 RELATED WORK

Section 033000 - Concrete.

1.04 QUALITY ASSURANCE

- A. General:
1. Coordinate the work of all trades to ensure proper placement of all materials, anchors, etc., as well as providing for openings and anchors for the installation of surface mounted materials and equipment.
 2. Qualifications for Workmen: Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.
 3. Rejection: In the acceptance or rejection of rough carpentry, no allowance will be made for lack of skill on the part of the workmen.
- B. Standards and References: (Latest Edition unless otherwise noted)
1. 2010 California Building Code (CBC).
 2. Lumber: West Coast Lumber Inspection Bureau (WCLIB); Standard Grading Rules for West Coast Lumber No. 17.
 3. Lumber: Western Wood Products Association (WWPA); Western Lumber Grading Rules 05.
 4. Redwood: Redwood Inspection Service (RIS); Standard Specifications for Grades of California Redwood Lumber.
 5. Wood Sheathing: The Engineered Wood Association; Specifications and Grades.
 - a. Structural Plywood: United States Product Standard PS1, Group 1 Douglas Fir.
 - b. APA rated sheathing: United States Product Standard PS2.
 6. Wood Preservative: American Wood-Preservers' Association (AWPA):
 - a. U1, Use Category System: User Specification for Treated Wood.
 - b. M4, Standard for the Care of Preservative-Treated Wood Products.
 7. 2005 National Design Specification for Wood Construction (NDS).

- C. Submittals: (Submit under provisions of Section 01330)
 - 1. Certification:
 - a. Preservative Treated Wood: Certification for waterborne preservative and that moisture content was reduced to 19 percent maximum, after treatment.
- D. Tests and Inspections:
 - 1. A testing program is required prior to start of construction. Testing program to be done in Compliance with the 2010 CBC requirements and in collaboration with Testing Laboratory, Design team, contractor, owner and submitted for review by the agency in charge of building enforcement. Requirements below are minimum requirements; additional requirements may be required in final testing program.
 - 2. If indicated on the Structural Drawings, load test expansion and epoxy anchors as indicated on the drawings.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 3.3 of the Instruction to Bidders of the Bid Package Section 00003.

1.06 SUBMITTALS

Provide in accordance with Article 3.11 of the General Conditions.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protection:

- 1. After delivery, store all materials off the ground, covered, and in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather. Maintain wood at the maximum moisture levels indicated in Materials Section.
- 2. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately store to prevent its inadvertent use. Do not allow installation of damaged or otherwise non-complying material.
- 3. Use all means necessary to protect the installed work and materials of all other trades.
- 4. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Sawn Lumber:

- 1. Lumber (Wood Framing): Meet requirements of following minimum grades. All grades to WCLIB Grading Rules No. 17. Species shall be Douglas Fir - Larch

<u>Item</u>	<u>Sizes</u>	<u>Grade</u>	<u>Maximum Moisture Content at Initial Use</u>	<u>Notes</u>
All Material	2x	No. 2	19%	Unless Noted Otherwise
All Material	3x,4x	No. 2	30%	Unless Noted Otherwise
All Material	6x	No. 1	30%	Unless Noted Otherwise
Decking	2x	Select Dex	19%	

- 2. "At initial use" shall be that point at which nails, screws, bolts, split rings, shear plates or other fasteners or the holes for said fasteners are placed in the wood.

3. All sawn lumber is assumed to be enclosed in the dry building envelope in the final service condition, unless noted otherwise, and free to dry to moisture content less than 19%.
 4. The Contractor shall use whatever means necessary, including site drying to ensure that the moisture contents above are not exceeded.
 5. All studs, plates, joists, rafters and beams 3x and thicker shall be free of heart center in accordance with the specified grading standards.
- B. Wood Sheathing:
1. Roof and Wall Structural Sheathing: PS1 and PS2 APA rated sheathing with exterior glue. Thickness type and grade shall be as indicated on Drawings.
 2. Where indicated on the Architectural Drawings as interior wall backing behind tile and in all toilet rooms behind sheet rock, to be C-C APA rated sheathing with exterior glue. Thickness shall be 5/8-inch at all locations.
 3. Flooring: C-C APA Performance rated tongue and groove with exterior glue. Thickness type and grade shall be as indicated on the Drawings.
- C. Building Paper: Fed. Spec. UU-B-790a, Type I, Grade B (15 lb. min. unless noted elsewhere.).
- D. Rough Hardware Fastenings and Connections: All types including bolts, lag screws, nails, spikes, screws, washers and other rough hardware, of kinds that may be purchased and that require no further fabrication, shall be furnished and installed for all finish and rough carpentry and shall conform to 2005 NDS Standards and dimensions. All hardware exposed to weather shall be hot-dipped galvanized per ASTM A123 Standards. All nails used into pressure treated lumber shall be hot-dipped galvanized per ASTM A123 or stainless steel.
1. Common wire nails or spikes unless noted otherwise on the Drawings. Box nails and sinker nails are not permitted. Vinyl coating is permitted on nails when not exposed to weather.
 2. Bolts: Bolt material shall conform to ASTM A307, Grade A. Bolt dimensions shall conform to ANSI/ASME B18.2.1 with hex head of sizes indicated.
 3. Lag Screws: Lag screws shall conform to ASTM 307, Grade A. All lag screws shall have hex heads where exposed.
 4. Washers: Standard flat washers shall conform to ANSI B18.22.1, Type A, Wide Pattern. Steel plate washers shall be Simpson BP or BPS or equivalent. Malleable iron washers shall be standard malleable iron washers.
 5. Powder Driven Fasteners: Tempered steel pins with special corrosive resistant plating or coating. Pins shall have guide washers to accurately control penetration. Fastening shall be accomplished by low-velocity piston-driven power activated tool. Pins and tool shall be as manufactured by Hilti Fastening Systems or equivalent. See Drawings for size, type and embedment.
 6. Expansion Anchors: See Section 03300 for anchors to concrete and Section 04200 for anchors to masonry.
 7. Adhesive Anchors: See Section 03300 for anchors to concrete and Section 04200 for anchors to masonry.
 8. Fabricated Metal Timber Framing Connectors: Connectors shall be punched for nailing and bolting. Nails and nailing shall conform to the manufacturer's instructions with a nail provided for each punched hole. All connectors must have specific ICC approval. Types as noted on Drawings are Simpson Strong-Tie. Hardware suppliers other than Simpson shall submit a comparative material list itemizing product designation, load rating and supported member size for review by the enforcement agency and the Structural Engineer.

2.02 FABRICATION

A. Lumber:

1. All lumber shall be air or kiln-dried to the maximum moisture content indicated in Materials Section.
2. Furnish S4S unless otherwise noted.
3. Size to conform to rules of governing standard. Sizes shown are nominal unless otherwise noted.

B. Wood Treatment:

1. Preservative Treatment: The treating process and results thereof shall conform to the appropriate AWPA Standards for exterior, above ground use (3B) and as indicated in CBC Section 2303.1.8.
2. After treatment and prior to shipping, air or kiln-dry lumber to maximum 19 percent moisture content.
3. All treated wood shall be identified with a label meeting the requirements of CBC Section 2303.1.8.1.
4. The amount of preservative to be injected into the wood shall be as required by the AWPA standard for each type of installation.
5. All wood in contact with concrete or masonry shall be preservative treated.
6. Cut surfaces and bored holes in pressure treated wood shall be protected in accordance with AWPA Standard M4.

- C. Fire Treatment: All fire-retardant-treated wood shall be identified with a label meeting the requirements of CBC Section 2303.2.1. The treating process and results thereof shall meet the requirements of CBC Section 2303.2. Moisture content of fire-retardant-treated wood shall meet CBC Section 2303.2.5. Treater shall submit design and fastener values for treated wood to Structural Engineer for review. See Drawings for location of fire-retardant-treated wood.

2.03 SOURCE QUALITY CONTROL

- A. Grade Mark each piece of lumber. Marking must be done by recognized agency.
1. Douglas Fir shall bear WCLIB or WWPA grade stamp.
 2. Pressure treated Douglas Fir shall bear AWPA Quality mark.
- B. Wood Sheathing: Each panel shall be legibly identified as to type, grade and specie by APA grade. If plies are spliced, the slope of the scarf shall not be steeper than 1:8. White pockets will not be permitted in face plies.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Inspection:
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 proceed.
 2. Verify that rough carpentry may be performed in strict accordance with the original design and all pertinent codes and regulations.
- B. Discrepancies: In the event of discrepancy, immediately notify Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 WORKMANSHIP

- A. General: All rough carpentry shall produce joints true, tight, and well nailed with all members assembled in accordance with the Drawings and with all pertinent codes and regulations.

- B. Selection of Lumber Pieces: Carefully select all members. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing or making proper connections. Cut out and discard all defects which will render a piece unable to serve its intended function.
- C. Lumber may be rejected by the 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.
- D. Shimming: do not shim any framing component.
- E. Care shall be taken that notching and boring of members is in strict conformance with the Drawings and that there are no over-cuts.

3.03 FASTENING

- A. Nailing: Except as otherwise indicated on Drawings or specified, all nailing shall be as required by CBC Table 2304.9.1 - Fastening Schedule.
 - 1. Nails or Spikes shall be common wire unless noted otherwise. Penetration of nails or spikes shall be one-half the length of the nail or spike into the piece receiving the point. However, to connect pieces 2" in thickness, 16d nails shall be used unless noted otherwise.
 - a. Bore holes for nails wherever necessary to prevent splitting.
 - b. Use finish or casing for finish work.
 - c. Use of machine nailing is subject to a satisfactory installation of nails. Minimum edge distances shall be maintained. Nails installed through sheathing with nail guns shall not penetrate into the outer plies deeper than hand nailing. Submittal of guns and nails is required.
 - d. All nailing into Pressure-Treated lumber shall utilize hot-dipped zinc coated galvanized nails or stainless steel nails per CBC Section 2304.9.5.
- B. Bolts and Lag Screws: Bolts shall be sizes indicated on Drawings. Holes for bolts shall be 1/16-inch larger than the bolt diameter. Malleable, Steel plate or standard flat washers shall be used where heads or nuts would otherwise bear directly on wood surfaces. Malleable or plate washers shall be used on all anchor bolts. Cut washers are not permitted. Lag screws shall be screwed (not driven) into place. For the shank, holes shall be bored the same depth and diameter as shank. For threaded portion, holes shall be pre-drilled as follows:

Lag Screw Size	Thread Portion Pre-Drill
1/2" diameter	1/4" diameter
5/8" diameter	5/16" diameter
3/4 diameter	3/8" diameter
7/8" diameter	1/2" diameter
1" diameter	5/8" diameter

Soap Lag screws prior to installation. Tighten all bolts and screws before closing in.

- C. Framing Devices: Install according to the manufacturer's instructions unless otherwise noted.

3.04 FRAMING AND ROUGH CARPENTRY

- A. Sills: Shall be in long lengths of sizes shown, fastened with anchor bolts as indicated, a minimum of two anchor bolts per piece. Place steel plate washers (but not standard flat or malleable iron washers) under nuts bearing on wood. Set sills level and true.
- B. Studs, Posts and Columns: Shall be full length. Corners shall be as detailed. Partitions or walls containing plumbing, heating or other piping shall be so formed as to give proper

clearance for materials. Cut members as required to provide full bearing at ends. Connect to structure as indicated.

- C. Plates: Shall be full length of wall segment or 12-foot minimum and spliced as shown.
- D. Blocking: Blocking shall be same thickness and width of studs or joists unless shown otherwise. Blocking shall not be spaced over 8'-0" c.c. Install fire blocking in accordance with CBC. Horizontal fire blocking in walls shall be placed at floor lines and ceiling lines unless noted otherwise. Install blocking at all plywood joints where noted on the Drawings. Install wall width full height solid blocking at floor joists beneath all posts in walls. Blocking shall be installed around all wall, floor and roof penetrations.
- E. Joists and Beams: Shall be full span length and spliced over bearings unless shown otherwise. Install with crown side up. Beams or headers indicated to be built up of two or more joists shall be fabricated on the job using full length members. For two piece 2x members, stitch nail pieces together with 16d common nails spaced not over 12 inches c.c. and staggered. Clinch nails protruding through members. For three or more piece members, stitch bolt pieces together with ½" bolts spaced not over 12 inches c.c. and staggered.
 - 1. Provide double joists and headers at all openings through roof unless otherwise shown on Drawings.
 - 2. Provide typical headers at all openings through walls where one or more studs are required to be cut. For penetration through walls narrower than stud spacing, provide solid blocking on all sides for fastening finish materials.
- F. Wood Sheathing: Install to pattern indicated and provide blocking at joints where noted on the Drawings. Center all joints over bearing supports. Nail to framing as indicated. Install wood sheathing with face plies perpendicular to joists or studs unless indicated otherwise. Wall wood sheathing shall continue uninterrupted by ceilings or soffit from floor to floor or floor to roof unless specifically detailed on the Structural Drawings.
- G. Wood Furring, Stripping: Install as shown or required to provide nailing materials or passage of pipes, conduits, etc., not otherwise accommodated including ceiling stripping for gypsum drywall construction.
- H. Bridging: Space not over 8'-0" c.c. for spans over 16'-0". Joists 8 inches or less in depth shall not require bridging unless specifically indicated.
- I. Solid Wood Backing: Solid wood backing shall be provided for all wall and ceiling finishes and for supporting of mounted items for all trades, including but not limited to metal toilet partitions, toilet room accessories, frames, cabinets, casework, mirrors, trim, applied wall finishes, athletic equipment, food service equipment, piping, conduit, ducts, etc. Contractor shall coordinate placement of backing and supports with Subcontractor supplying mounted items.
- J. Building Paper: Install in all locations indicated except where included in other sections of the specifications.
- K. Cant Strips and Crickets: Shape to sizes shown. Rigidly fasten to construction. Form neat mitered corners.
- L. Wood Sheathing Backing: All toilet rooms, restrooms, single or joint occupancy shall have all walls backed with 5/8-inch thick wood sheathing with no surface voids. Install sheathing between the framing members and wallboard. The same wood sheathing shall also be provided and installed at all tile locations. At tile locations wood sheathing shall be installed between the framing members and the resin-cement backing board.

3.05 MISCELLANEOUS CARPENTRY WORK

- A. Install all items under other sections specified to be furnished and installed in other sections which relate to the rough carpentry work.
- B. Miscellaneous Carpentry Work not included under other sections but, indicated or required yet not specified elsewhere shall be furnished and installed hereunder, including appropriate fastening devices. Contractor shall provide miscellaneous carpentry work for all sections and divisions of work identified.
- C. Wood Curbs for Equipment: Construct all wood curbs for roof mounted equipment as detailed. Provide all miscellaneous blocking, bracing, supports, and other wood items as shown or required to complete the work.
- D. Plywood Backing for Electrical, telephone, and similar types of wall mounted equipment shall be provided hereunder where required. Plywood shall be 3/4-inch thick exterior A-C plywood with 'A' face exposed.
- E. Fire/Draft Stops: Construct fire and drafts stops in furred attic spaces where indicated or required by CBC code. Unless otherwise indicated on Drawings construct of not less than 5/8-inch Type 'X' gypsum wallboard or 1/2" wood sheathing, adequately supported by 2x4's at 24 inches c.c., braced diagonally to the roof structure. Draft stop and installation work shall conform to code requirements.
- F. Shoring and Bracing: Shore or brace for temporary support of all work as required during the construction period except any shoring and bracing specified and included under other sections of these specifications.
- G. Temporary Enclosures: Provide and maintain all barricades and enclosures required to protect the work in progress.
- H. Protect all work in progress and all work installed, as well as the work of all other trades. Any work damaged as a result of the work under this section shall be corrected to its original condition or replaced if directed by the Architect at no increase in cost to the Owner.
- J. Ventilation: Contractor shall include all labor and materials necessary to provide ventilation requirements of roof overhangs, eaves, attics, and all other components of the building required by codes to be ventilated. Work shall include removing knock-outs in wood I-joists for cross ventilation, drilling of blocking, wood sheathing, and other wooden components of the structure necessary to comply with requirements of the CBC for ventilation of buildings.

*****END OF SECTION*****

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SECTION 06200
FINISH CARPENTRY

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Supply and install complete Finish Carpentry Work as shown on Drawings and as specified herein. Provide hardware and attachment accessories as required for a complete and proper installation.

1.03 MEASUREMENTS

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

1.04 QUALITY CONTROL

Following standards apply to Work of this Section except where more stringent requirements are specified herein:

- A. Architectural Woodwork Institute "Quality Standards".
- B. Western Wood Products Association Manual.
- C. American Wood Preservers Association Specifications.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 3.3 of the Instruction to Bidders of the Bid Package Section 00003.

1.06 SUBMITTALS

- A. In accordance with Article 3.11 of the General Conditions.
- B. Submit shop drawings of millwork at full size or large scale showing sizes, materials, grain run, methods of construction, connection to adjacent members and installation. Indicate all backing members for installations and all hardware

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Douglas Fir: West Coast Lumber Inspection Bureau "Standard Grading and Dressing Rules" and Western Wood Products Association, graded "C" and better, flat grain grade marked by WCLIB or WWPA.
- B. Douglas Fir Plywood: U.S. Product Standard PS-1, American Plywood Association, grade trademarked "C-D", plugged, exterior glue, sanded.
- C. Blocking, Furring, etc.: Standard Grade Western White Pine, Construction grade Douglas Fir or other equally sound softwood, as graded by WCLIB or WWPA.
- D. Softwood Lumber: PS 20; custom grade in accordance with AWI maximum moisture content of 6%; of quality capable of transparent finish.
- E. Hardwood Lumber: FS MM-L-736; custom grade in accordance with AWI; maximum moisture content of 6% of quality capable of transparent finish.

1.06 COORDINATION

- A. Owner Responsibilities: Owner will engage a qualified testing agency to perform testing indicated.
1. Owner will furnish Construction Manager with name, address, and telephone number of testing agency.
 2. Payment for testing services will be made by the Owner directly to the testing agency.
 - a. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be paid by the Owner and charged to Contractor by an adjustment to the Contract Sum through a Change Order.
- B. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken.
 3. Perform tests and submit a certified written report of each test, inspection, and similar quality-control service to Owner, Architect, Construction Manager and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.
- C. Contractor Responsibilities: Coordinate sequence of activities to accommodate required testing services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities. Notify agency sufficiently in advance of operations to permit assignment of personnel.
 2. Acclimate enclosed spaces to the anticipated occupied temperature and humidity as required by the manufacturer of the specified flooring material(s) and in accordance with ASTM testing requirements.
 3. Cooperate with agencies performing required tests and inspections, provide reasonable auxiliary services as requested. Provide the following:
 - a. Access to the Work.
 - b. Incidental labor and facilities necessary to facilitate tests and inspections.
 - c. Security and protection for testing and inspecting equipment at Project site.
 4. Project Meeting: Schedule and conduct project meeting not less than 30 days prior to flooring installation to discuss testing requirements, specifications and locations prior to testing. Attendees shall include Owner, Architect, Construction Manager, Contractor, Testing Agency, and adhered floor installer representatives.

1.07 CLOSE-OUT: also comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports: Final Reports related to Item 1.06.
- B. As-Builts: Not required

- C. Operation and Maintenance Data: None required.
- D. Extra Materials: None required.
- E. Extended Warranty: Refer to specific Floor Finish Specification Sections for requirements. Comply with the requirements of the General Condition Article 3.5 and Section 01740.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment to be provided by Testing Agency.
- B. American Moisture Test, Inc. www.dometest.com (866) 670-9700
 - 1. ASTM F1869 Moisture Vapor Emission Test kits
 - 2. ASTM F-2170 In-Concrete Relative Humidity Testing System
 - 3. ASTM F-710 Alkalinity-pH wide range 1 – 14pH meter

PART 3 - EXECUTION

3.01 EXAMINATION

Site: Weatherproofed, doors installed and windows secured. Do not start testing process when site has standing water, surface contaminates, exposed to exterior conditions or concrete installation is less than 90 days of age.

3.02 PREPARATION

Contractor Responsibilities:

- 1. Preparation of Substrates:
 - a. Prepare concrete substrates according to ASTM requirements.
 - b. Verify that substrates are dry and free of curing compounds, sealers, and hardeners for vapor emission testing per ASTM F-1869.
 - c. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- 2. Temperature and Humidity: Maintain site at the temperature and humidity conditions to those anticipated during normal occupancy and maintain these conditions 48 hours prior and during testing period. If meeting this criteria is not possible, then minimum conditions should be 75± 10°F and 50± 10% relative humidity.
 - a. When a building is not under HVAC control, record temperature and humidity at start and end of testing using a portable data logging system.

3.03 TESTING

Testing: Testing Agency shall perform tests as follows:

- 1. Water vapor emission testing, ASTM F 1869.
 - a. Perform all gram scale weights on site.
 - b. Expose dome for 60 to 72 hours.
 - c. Report results as pounds of emission per 24 hours per ASTM F-1869.
 - d. Perform subfloor moisture testing in accordance with the Manufacturer's requirements for each floor system type. Do not proceed with flooring

installation until results of moisture tests are acceptable. All test results shall be documented and retained

2. In-Concrete Relative humidity testing, ASTM F 2170.

- a. Satisfactory results shall have a maximum 75 percent relative humidity level measurement.

3. Alkalinity Testing:

- a. Apply neutral-pH solution to form a 1-inch diameter circle directly to interior of moisture dome.
- b. Allow to absorb into concrete for 1 minute.
- c. Apply flat tip pH meter to solution and document result as required by manufacturer.
- d. Perform pH tests on concrete floors regardless of their age or grade level in accordance with the Manufacturer's requirements for each floor system type. PH level shall not exceed range of the Manufacturer's requirements for each floor system type. All test results shall be documented and retained

- B. Adhered floor coverings shall not be installed in areas where satisfactory test results have not been obtained.
- C. Consult Architect on remedial measures to reduce concrete levels prior to installing flooring. Installation of flooring deems acceptance of on-site conditions for a warranted application.

3.04 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
- B. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."
- C. Protect construction exposed by or for quality-control service activities.
- D. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

*****END OF SECTION*****

SECTION 06410
W. I. C. CERTIFIED CABINET WORK

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 SUMMARY

Work Included:

- A. Provide factory-finished cabinets, and similar items where shown on the drawings, as specified herein, and as needed for a complete and proper installation.
- B. All cabinet work complete with all accessories, fittings and hardware.
- C. Preparations of cabinets to receive sinks, electric outlets, etc., as required and shown on the Drawings.
- D. Shelf brackets and shelves.
- E. Countertops.

1.01 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. In addition to complying with all pertinent codes and regulations of governmental agencies having jurisdiction, comply with the following for the grade or grades specified:
- C. Identification of components:
 - 1. On a concealed but accessible surface of each item of the work of this Section, where accepted by the Architect, plainly stamp the identifying number or numbers shown on the Drawings for that item.
 - 2. On a concealed but accessible surface of each removable part of each item of the work of this Section, where accepted by the Architect, plainly stamp an identifying number or numbers for that item to aid in rapid and efficient identification and reinstallation of removable parts.

1.02 SUBSTITUTIONS

Substitutions will be considered per General Condition Article 3.11.4 and Section 01630.

1.03 SUBMITTALS

- A. Provide in accordance with Article 3.11 of the General Conditions.
- B. Product data: submit:
 - 1. Materials list of proposed to be provided under this Section;
 - 2. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades;
 - a. Identify cabinets, fixtures, moldings, and other items in accordance with the system used on the Drawings;
 - b. Show overall dimensions, and call specific attention to all dimensions and conditions that vary from those shown on the Drawings.

3. Shop drawings shall indicate list of materials and hardware, sizes, sections, elevations, and details of construction and assembly as required by Section 1, Manual of Millwork "Millwork Shop Drawings Woodwork Institute of California, (Current Edition)."
4. The WIC Certified Compliance Grade Stamp shall be affixed to the casework shop drawings, certifying that the casework will be manufactured in accordance with WIC Premium Grade.

C. Samples:

1. Accompanying the Shop Drawings, submit samples of all items of finish hardware, metal work, trim, glasswork, plastic overlays, and similar items proposed to be provided under this Section.
2. After the Architect has selected general colors and types of finish, prepare and submit samples of the selected finishes on species of the actual cabinet and fixture material.
3. Revise and resubmit the samples as needed to secure the Architect's acceptance prior to fabrication of casework.

D. Certification:

1. The cabinetwork manufacturer shall certify on his letterhead that he holds a current license from the Woodwork Institute of California, to manufacture WIC cabinetwork. He shall list his license number and submit this certificate with his shop drawing submittal, to the Architect.
2. Before delivery to the job site, the fabricator shall issue a WIC Certified Compliance Certificate to the Architect, certifying that the Plastic Covered Casework products he will furnish for this project fully meet all requirements of "Premium Grade", as modified herein. Each unit of casework shall bear the WIC Certified Compliance Stamp indicating "Premium Grade" and all Countertop Work shall bear the "Custom Grade" stamp.

1.04 PRODUCT HANDLING

- A. Comply with the requirements of Section 01620.
- B. Comply with pertinent provisions of Division 1 and WIC Manual of Millwork, Technical Bulletin 419-R "Recommended Care and Storage of Architectural Millwork."
- C. Provide additional protection as needed to assure that the work of this Section remains undamaged during fabrication, installation, and the time between completion of installation and actual acceptance of the total Work.
- D. Do not deliver cabinets and fixture materials or products to the job site until concrete and plaster installations are completed and dry, not until the building interior has attained a relative humidity of 50% to 55% at 70 degrees F.

1.05 CLOSE-OUT: also comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports: None required.
- B. As-Builts: Not required
- C. Operation and Maintenance Data: None required.
- D. Extra Materials: None required.
- E. Extended Warranty: Comply with the requirements of General Condition Article 3.5 and Section 01740.

PART 2 – PRODUCTS

2.01 TYPE AND MANUFACTURE

Cabinets shall be manufactured in accordance with WIC Manual of Millwork, Section 15 - Premium Grade, modified as indicated on the drawings and herein specified. All units shall be factory built and factory finished. Provide Style A - frameless, Type I construction unless otherwise noted.

2.02 CASEWORK DEFINITIONS

A. Exposed Portions:

1. All surfaces visible when doors and drawers are closed.
2. Underside of bottoms of cabinets over 4'-0" above finished floor.
3. Cabinet tops under 6'-0" above finished floor.
4. Visible front edges of web frames, ends, divisions, tops, shelves, and hanging stiles.
5. Visible surfaces in open cabinets or behind glass.
6. Interior faces of hinged doors.

B. Semi-Exposed Portions:

1. Shelves, except in open cabinets.
2. Divisions, except in open cabinets.
3. Interior face of ends, backs, and bottoms, except in open cabinets.
4. Drawer sides, sub-fronts, backs, and bottoms.
5. The underside of bottoms of cabinets between 2'-6" and 4'-0" above the finished floor.
6. All rooms designated as storage, janitor, or utility.
7. Knee spaces.

C. Concealed Portions:

1. Toe space unless otherwise specified.
2. Sleepers.
3. Web frames, stretchers, and solid sub-tops.
4. Security panels.
5. Underside of bottoms of cabinets less than 2'-0" above the finished floor.
6. Flat tops of cabinets 6'-0" or more above the finished floor.
7. The three non-visible edges of adjustable shelves.
8. The faces of cabinet ends of adjoining units that butt together.

2.03 MATERIALS, FINISH AND CONSTRUCTION

A. Exposed Portions:

1. Material for exposed portions shall be faced with decorative high pressure laminated plastic.
 - a. Plastic laminate shall be Standard Grade, satin finish, thermoplastic laminate surfacing, .050" thick, meeting the requirements of NEMA LD 3-85. Backing sheets shall be .020" thick conforming to the requirements of NEMA LD,

latest edition. Use post-forming grade where required by the drawing details, minimum thickness .042" +/- .004".

- b. Color and pattern as indicated on the Drawings.
 - c. If color and pattern is not indicated, then Architect will select as part of the review of Shop Drawings. In this case, acceptable manufacturers include Wilsonart, Laminart, Formica, and Nevamar. Architect reserves the right to select more than one color and pattern for use on any one cabinet.
- B. Semi-exposed Portions:
- 1. Material for semi-exposed portions, except interior faces of hinged doors, shall be high-pressure laminate cabinet liner meeting the requirements of NEMA LD-3-85.
 - 2. The interior faces of hinged doors shall be faced with 0.032" minimum thickness high pressure laminated plastic conforming to NEMA LD-3.
- C. Concealed Portions:
- 1. Material for concealed portions may be sound, dry solid stock, plywood or particleboard, except where otherwise specified herein.
- D. Visible Edges:
- 1. All visible edges, exposed or semi-exposed, of ends, tops, bottoms, shelves, webs, stretchers, divisions, doors and drawer fronts shall be bound with butyl or tenite plastic T-molding secured by a 3/8" serrated leg glued in place with water-resistant glue or edged with .050" thick high pressure laminated plastic matching adjacent color.
- E. Laminate Core Material shall be particleboard meeting the requirements of ANSI A 208.1-87, Table 1 - Grade 1-M-3.
- F. Adhesive shall be Type II, water resistant.

2.04 DOORS

- A. All doors, including cabinet doors, shall be flush overlay type completely covering all cabinet face frames. Door cores shall be particleboard with 0.050" thick high-pressure laminated plastic on exposed face of door, net thickness to be 0.735". Edge bands shall be .050" thick high pressure laminated plastic matching adjacent surfaces or T-molding in color selected by the Architect. All exposed plastic shall be laminated to core by cold press only, in accordance with manufacturer's recommendations. Cabinet doors shall have 0.032" high-pressure laminated plastic on the inside face.
- B. Doors under 48" in height shall have a minimum of two hinges. Doors 48" to 84" high shall have a minimum of three hinges, and over 84" shall have a minimum of four hinges.

2.05 DRAWERS

- A. Drawer sides, backs, and sub-fronts shall be multiple dovetail or doweled construction and made of 0.50" minimum thickness hardwood or high-pressure laminate cabinet liner with particleboard core.
- B. Drawer bottoms shall be 1/4" enameled hardboard rabbeted into sides, front and back, and glued and blocked into rigid position. Drawers shall be supported upon metal side guides with nylon rollers. Provision shall be made to stop the drawer in both "in" and "out" positions without dependence on the drawer front. Metal drawer slides shall have a capacity of 75 pounds except that large drawers and file drawers shall be equipped with minimum 100-pound capacity full extension slides. Drawers shall operate smoothly without excessive play.
- C. Drawer fronts shall be flush overlay type completely covering all cabinet face frames. Cores shall be particleboard with 0.050" thick high pressure laminated plastic on exposed face of

drawer front, net thickness to be 0.735". All exposed plastic shall be laminated to the core by cold press method only, in accordance with the manufacturer's recommendations. Backing sheet on the inside face shall be 0.032" minimum thickness. Edge bands shall be .050" thick high pressure laminated plastic adjacent surfaces or T-molding in color selected by the Architect. Maximum clearances of 3/32" shall be maintained between adjacent drawer fronts and doors. Secure drawer fronts to drawer with No. 8 x 1" screws.

D. Provide security panels above locked drawers.

2.06 TOPS AND BOTTOMS

A. Tops and bottoms shall be particleboard or plywood with 0.050" high pressure laminated plastic on exposed portions or cabinet liner on semi-exposed portions; net thickness shall be 0.735".

B. Plywood bottoms of upper cabinets with spans 4'-0" or over in length between vertical members of the cabinet body shall be a minimum of 1" in thickness. Particleboard bottoms of upper cabinets with spans 3'-6" or over in length between vertical members of the cabinet body shall be a minimum of 1" in thickness.

2.07 ENDS AND DIVISIONS

A. Cabinet ends and divisions shall be particleboard or plywood as detailed on the Drawings with 0.050" thick high pressure laminated plastic on exposed faces or high pressure laminate cabinet liner on semi-exposed portions; net thickness shall be 0.735". Visible edges shall be T-molding edge banding or .050" high pressure laminated plastic.

B. Cabinet ends shall be lock-jointed, securely glued, and blind nailed or screwed to the tops, web frames, and bottoms at not to exceed 4" on center. Doweled construction is acceptable.

2.08 WEB FRAMES AND STRETCHERS

A. Web frames and stretchers shall be a minimum of 0.735" in thickness and 2-1/2" in width, and shall be solid stock or plywood. A solid piece of plywood or particleboard a minimum of 0.735" in thickness, the full length and depth of the cabinet opening may be used in lieu of a web frame or stretchers.

B. Web frames shall be furnished under countertops; or a continuous stretcher front and rear may be furnished in lieu of the frame, and shall be attached by means of a dado, tenon or metal angle bracket. A continuous stretcher at the front shall be furnished at the approximate mid-height of all drawer cabinets over 2'-6" in drawer opening height and shall be attached by means of a dado, tenon or metal angle bracket.

2.09 BACKS

A. Semi-exposed backs shall be 1/4" thick plywood or tempered and sealed hardboard with high-pressure laminate cabinet liner. Exposed backs shall be 1/2" thick plywood with 0.050" high-pressure laminated plastic.

B. Color shall match adjacent semi-exposed or exposed portions as applicable.

C. Backs shall be securely nailed, doweled or dadoed to the case body, divisions, or fixed shelves.

2.010 SHELVES

A. Shelves shall be plywood or particleboard with 0.050" thick high pressure laminated plastic when shelves are exposed and high-pressure laminate cabinet liner when shelves are semi-exposed. Minimum net thickness shall be 0.735". Exposed edges shall be bound with T-molding or 0.050" high pressure laminated plastic.

B. Closet shelving and exposed shelving shall have 0.050" thick high pressure laminated applied to top and bottom surfaces with front edge bound in .050" thick high pressure laminated plastic or T-Molding.

- C. General shelving as in Janitor's closets and storage areas shall have .032" thick high-pressure cabinet liner applied to top and bottom surfaces and exposed edges.
- D. Adjustable shelves with unsupported spans in excess of 3'-6" between vertical members of the case body for plywood, and in excess of 3'-0" for particleboard, shall be a minimum of 1" in thickness; and shall be mounted on surface or recessed metal shelf standards with clips adjustable at 1/2" center.
- E. Fixed shelves with unsupported spans of 4'-0" or over between vertical members of the case body for plywood, and 3'-6" or over for particleboard, shall be a minimum of 1" in thickness; and shall be mounted on aluminum clips 1" x 1" x 1-1/2" at each corner.

2.011 CABINET BASES AND SLEEPERS

Cabinet bases may be constructed with either separate or integral bases. All bases and sleepers shall be 0.735" solid stock. Sleepers shall be provided at a maximum of 3'-0" on center.

2.012 ANCHOR STRIPS

- A. Anchor strips of solid stock or plywood shall be a minimum of 1/2" in thickness and a minimum of 2-1/2" in width, and shall be provided at the wall side of the cabinet back on both top and bottom of wall hung cabinets and at top only of base cabinets unless otherwise shown on the Drawings.
- B. Cabinets over 5'-0" in height shall have an intermediate anchor strip.

2.013 PLASTIC LAMINATE COUNTERTOPS

- A. Sink cabinet countertops of high-pressure laminated plastic shall be pressure bonded to waterproof 0.735" plywood as recommended by NEMA Standards. Plywood shall be faced with a close grain hardwood to minimize telegraphing of core. Countertops that do not join sink counters may be 0.735" plywood or 0.735" particleboard.
- B. Backsplash work, including end returns, shall be made with high pressure laminated plastic and self-edged in color and patterns selected by Architect. Plastic laminate shall be minimum 0.050" thick for flat surfaces and backsplash. In addition to top surfaces and edges, apply .05" plastic laminate to the underside of countertops exposed at exterior areas of casework.
- C. The underside of countertops with particleboard cores shall have a .020" thick backing sheet securely glued to the core with identical adhesive and under identical circumstances as the face sheet conforming to NEMA LD, latest edition.
- D. Adhesives used to secure plastic laminate to particleboard backing shall be ureaformaldehyde cold setting or phenol resin with a catalytic agent to be set under a pressure of 30 lbs. psi with cold press method.
- E. Back cut all joints to 89.75 degrees to insure flush fit at junction to top where plastic sheets meet joints. Joints shall be secured either by a series of 1/8" x 3/4" cold rolled steel strips 3" o.c. through entire joint or by wedge type fasteners. No joints shall be made through sink openings or other openings where water is to be used. Where no splash occurs, scribe back or edge of countertop to wall. Where backsplashes occur, they shall be square butt joined with the countertop.
- F. Accurately cut openings in countertops to receive sinks. Sinks shall be installed under Plumbing Section.
- G. Stainless steel "T" shaped "Clamp-down" type sink rings shall be furnished and installed under Plumbing Section. Contractor shall make necessary provisions for installation thereof and coordinate this part of work with others as required.

2.014 HARDWARE

All hardware shall be jig fitted at the factory by trained craftsmen only. Provide U.S. 26D Dull Chrome finish - unless specified otherwise on the Drawings.

1. Hinges - National Lock #B 851 - 3 on doors over 42" high; 2 on doors under 42" high.
2. Pulls - National NA 928-26D extruded anodized clear aluminum (3-3/4" long by 1-1/4" high by 3/4" deep) or accepted equal.
3. Catches - Amerlock #T-9798-AW three-plate magnetic catch manufactured by Amerlock Corporation, or accepted equal.
4. Elbow Catches - Amerlock #3675 on companion doors where locks are specified.
5. Door Locks - National C8102.6 - master keyed to other casework.
6. Drawer Locks - National C8108 - master keyed to other casework.
7. Drawer Guides - Light & Medium Duty: Accuride 7434. Heavy Duty: Accuride 4034.
8. Shelf Standards - Knappe & Vogt #233 mounted with four Knappe & Vogt #237 clips for each shelf, or accepted equal.
9. Shelf Bracket - Simpson Strong-tie No. SBV or accepted equal.
10. Mirrors - 1/4" plate 10" x 12" silvered for unframed teachers wardrobe mirror, double strength B grade for doors.
11. Hang Rod at Wardrobes - 1-1/4" o.d. x .042 wall aluminum tubing, clear, anodized.
12. Hang Rod Flanges - Ronther Reiss #R44-55.
13. Television Swivel Base - Ball Son Co., #1005-00-00. Phone: (213) 589-5151.
14. Hang Rod and Hooks - 1" o.d. tubular steel hanger pole, chrome finish with hang rod flanges. Hooks to be Raymond Engineering, Inc., Model #924: black, double prong nylon.

2.015 MISCELLANEOUS MATERIALS

Adhesives:

1. For woodwork and millwork, use water resistant and mold resistant adhesive complying with Fed Spec MM-A-125, type II.
2. For plastic laminates, use phenol, resorcinol, or melamine base, complying with Fed Spec MM-A-181, in type, grade and class best suited for the intended use.

2.016 FABRICATION – GENERAL

A. All units shall be completely fabricated and finished in the factory, except as otherwise specified or indicated for modified units. All doors and all hardware shall be jig fitted and ready for site installation.

B. Joinery:

1. All cabinet members shall be securely fastened together.
2. All joints shall be securely glued.
3. All exposed and semi-exposed joints shall be tight and true.
4. The use of finish nails is allowed only where they will not show through a plastic face.
5. Construction joinery shall be dados, lock joints, rabbets or doweled joints.

C. Edges of exposed portions:

1. Blind or stop dados are required. When lock joints are used they shall not run through the edge band.

D. Scribe members:

1. Provide sufficient additional material to permit scribing to walls, floors, and related work.
 2. Provide adequate allowance for shrinkage occurring after installation.
- E. Framing and blocking:
1. Assemble with bolted and screwed connections only, securing to structural backing with cinch anchors, expansion screws, or toggle bolts as necessary.
- F. Cut and fit the work of this Section as necessary to receive, clear, engage or support other parts of the Work, and as needed for interface with electrical, plumbing, and other units.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.
- E. Beginning of installation means acceptance of conditions.

3.02 PREPARATION FOR INSTALLATION

- A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.
- B. Make necessary measurements in the field to assure proper fit of shop fabricated items.
- C. Prior to start of installation, verify that the work of other trades is sufficiently complete to properly permit this installation to proceed.

3.03 INSTALLATION

- A. Install the work of this Section in accordance with the accepted Shop Drawings and Section 26, WIC "Manual of Millwork", using factory trained craftsmen.
 1. Scribe units to wall, floor, and other surfaces as appropriate, with not more than 1/32" clear between the cabinet or fixture and the abutting permanent surface, and with no change of clearance in excess of 0.01" in any 4".
 2. Set each unit square, level, plumb, and aligned within a tolerance of one on 1000 vertically and horizontally, and within 1/4' of the designated location for free-standing work.
- B. Coordinate the time and installation with availability of other trades to make required utility connections.
 1. Provide access panels as needed for connection and maintenance of utilities.
 2. Prepare tops to receive sink frames, plumbing trim, electrical outlets, etc., provided under other Sections. Obtain necessary templates from related trades.
- C. Test each plumbing and electrical item through at least five operating cycles, and adjust as needed to achieve optimum operation.
- D. Upon completion of installation, thoroughly clean each item by use of only such cleaning materials as are recommended by the manufacturer of the item being cleaned.
- E. Touch-up scratches and abrasions to be completely invisible to the unaided eye from a distance of five feet.

- F. All casework shall be anchored to the building in conformance with requirements of the Office of the State Architect. Casework shall be anchored to walls to withstand a horizontal load in any direction equal to 50% of the weight of the casework and contents (a minimum of 50 pounds per square foot of horizontal projection per shelf).

***** END OF SECTION *****

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SECTION 06600
PLASTIC SURFACING MATERIALS

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 SUMMARY

Provide factory-finished Surface Materials, and similar items where shown on the drawings, as specified herein, and as needed for a complete and proper installation. Work may include, but is not limited to:

1. Standard Decorative Laminates.
2. Solid Surfacing.

1.03 REFERENCES

- A. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.
- B. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- C. ISO 4586-2 - High Pressure Decorative Laminates; International Organization for Standardization.

1.04 SUBSTITUTIONS

Substitutions will be considered per General Condition Article 3.11.4 and Section 01630.

1.05 SUBMITTALS

- A. Provide in accordance with Article 3.11 of the General Conditions.
- B. Samples:
 1. Selection Samples: Submit actual samples of surfacing materials to illustrate full range of colors, patterns, and finishes available.
 2. Verification Samples: Submit two samples, each 12 inches square, illustrating each selected surfacing material in specified color, pattern, and finish.
- C. Manufacturer's Instructions:
 1. Submit manufacturer's printed installation instructions for each product.
 2. Submit manufacturer's Safety Data Sheets (M.S.D.S.) for each adhesive.

1.06 PRODUCT HANDLING

Comply with the requirements of Section 01620.

1.07 CLOSE-OUT: also comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports: None required.
- B. As-Builts: Not required
- C. Operation and Maintenance Data: None required.
- D. Extra Materials: None required.
- E. Extended Warranty: Comply with the requirements of General Condition Article 3.5 and Section 01740.

PART 2 – PRODUCTS

2.01 STANDARD DECORATIVE LAMINATES

- A. Acceptable Products: As indicated on the Drawings and in the Finish Schedule.
- B. Product Description: Decorative surface papers, impregnated with melamine resins, bonded under heat and pressure to kraft papers impregnated with phenolic resins.
- C. Standard Decorative Laminate – General Purpose Type: having the following physical characteristics:
 - 1. Sheet thickness: 0.048-inch (1.219 mm) plus/minus 0.005-inch (0.127 mm).
 - 2. Exceeding performance requirements of NEMA LD 3-1995 Grade HGS.
 - 3. Surface burning characteristics in accordance with ASTM E 84; unbonded: Flame spread 55; Smoke developed 30.
 - 4. Patterns and Finishes: Selected from manufacturer's full range of available selections, as selected and approved by Architect.

2.02 SOLID SURFACING MATERIAL

- A. Acceptable Product: As indicated on the Drawings and in the Finish Schedule.
- B. Product Description: Homogenous sheet material composed of acrylic resins, fire-retardant filler materials, and coloring agents.
 - 1. Nominal sheet thickness: 0.50 inch (13 mm).
 - 2. Surface burning characteristics in accordance with ASTM E 84: Flame spread less than 25; Smoke developed less than 25.
 - 3. Liquid Absorption, ISO 4586-2, for 1/2-inch material thickness: 0.4 percent after 2 hours boiling water.
- C. Izod Impact, ASTM D 256, Method A: 0.2 foot pounds per inch.
 - 1. Tensile Modulus, ASTM D 638 Nominal: 1.7 million pounds per square inch.
 - 2. Thermal Expansion, ASTM D 696: 0.000019-inch per inch per degree F, maximum.
 - 3. Hardness, ASTM D 2583, Barcol Impressor: 59.
 - 4. Flexural Modulus, ASTM D 790: 1.6 million pounds per square inch.
 - 5. Deflection Temperature under load, ASTM D 648: 90 degrees C.
 - 6. Stain Resistance: ANSI Z124.6 modified, Method 3.4: No effect.
 - 7. Boiling Water Resistance, NEMA LD 3-1995, Method 3.5: No effect.
 - 8. High Temperature Resistance: NEMA LD 3-1995, Method 3.6: No effect.
 - 9. Radiant Heat Resistance: NEMA LD 3-1995, Method 3.10: No effect.
 - 10. Light Resistance: NEMA LD 3-1995, Method 3.3: No effect.
 - 11. Ball Impact Resistance, NEMA LD 3-1995, Method 3.8, one half pound ball, unsupported: 125 inches.
 - 12. Specific Gravity: 0.977 ounces per cubic inch (1.69 grams per cubic centimeter).
 - 13. Approximate weight: 4.2 pounds per square foot (20.5 kg/square m).
 - 14. Weatherability: ASTM D 2565: Pass.
 - 15. Fungus Resistance, ASTM G 21: Pass.
 - 16. Bacterial Resistance, ASTM G 22: Pass.

17. Pittsburgh Protocol Toxicity: 66.9 grams.
18. Patterns and Finishes: Selected from manufacturer's full range of available selections, selected and approved by Architect.
19. Impact Resistance NEMA LD3-1995 (1/2 lb. Ball) SSV bonded to substrate*** Method 3.08 modified. 125" (No Failure)
20. Tensile Toughness ASTM D 638. 21 (in. – lb./in. ³)
21. Tensile Modulus ASTM D 638 Nominal. 1.7×10^{-5} lb./in.³
22. Density 1.60 gram/cm³
23. Approximate weight 4.2 lbs./ft²
24. Pittsburgh Protocol Toxicity = 30 grams range

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.
- E. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

Surface preparation: Precondition surfacing materials and surfaces to receive surfacing materials in accordance with manufacturer's printed installation instructions.

3.03 APPLICATION

Install materials in accordance with manufacturer's printed instructions.

***** END OF SECTION *****

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SECTION 06200
FINISH CARPENTRY

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract requirements and Division 1, General Conditions apply to this section.

1.02 SCOPE OF WORK

Supply and install complete Finish Carpentry Work as shown on Drawings and as specified herein. Provide hardware and attachment accessories as required for a complete and proper installation.

1.03 MEASUREMENTS

Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

1.04 QUALITY CONTROL

Following standards apply to Work of this Section except where more stringent requirements are specified herein:

- A. Architectural Woodwork Institute "Quality Standards".
- B. Western Wood Products Association Manual.
- C. American Wood Preservers Association Specifications.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 5.1 of the Instruction to Bidders of the Bid Package Section 00003.

1.06 SUBMITTALS

- A. In accordance with Article 3.11 of the General Conditions.
- B. Submit shop drawings of millwork at full size or large scale showing sizes, materials, grain run, methods of construction, connection to adjacent members and installation. Indicate all backing members for installations and all hardware

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Douglas Fir: West Coast Lumber Inspection Bureau "Standard Grading and Dressing Rules" and Western Wood Products Association, graded "C" and better, flat grain grade marked by WCLIB or WWPA.
- B. Douglas Fir Plywood: U.S. Product Standard PS-1, American Plywood Association, grade trademarked "C-D", plugged, exterior glue, sanded.
- C. Blocking, Furring, etc.: Standard Grade Western White Pine, Construction grade Douglas Fir or other equally sound softwood, as graded by WCLIB or WWPA.
- D. Softwood Lumber: PS 20; custom grade in accordance with AWI maximum moisture content of 6%; of quality capable of transparent finish.
- E. Hardwood Lumber: FS MM-L-736; custom grade in accordance with AWI; maximum moisture content of 6% of quality capable of transparent finish.

2.02 ACCESSORIES

- A. Nails, bolts, nuts, washers, blind fasteners, lags and screws, size and type to suit application.
- B. Wood Filler: oil base, tinted to match surface finish color.
- C. Shelf Standards and Rests: Knapé and Vogt #255 & #256 for recessed application. Provide two hold down clips for each shelf in the slot above
- D. Closet Hanger Bars and Supports: Knapé and Vogt #770, #660, #734, #735, and #1195. Provide intermediate support of spans over 6'-0".

2.03 SHOP TREATMENT OF WOOD MATERIALS

- A. Shop pressure treat wood materials requiring UL fire rating or preservations.
Provide UL approved identification on fire retardant treated material.
- B. Wood Preservative (PT type) Wolmanized, Pressure Treated Lumber, manufactured by Osmose Wood Products or approved equal.
- C. Fire Retardant (FR-S Type) chemically treated, and pressure impregnated, capable of providing a maximum rating of 25; manufactured by Demose Wood Products. Dricon FRT or approved equal.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Correct conditions detrimental to timely and proper completion of the Work.
- C. Do not proceed until unsatisfactory conditions are corrected.
- D. Beginning of installation means acceptance of conditions.
- E. Verify that surfaces and openings are ready to receive work and field measurements are as shown on Shop Drawings and instructed by the fabricator.
- F. Verify that mechanical, electrical, and building items affecting work of this Section are placed and ready to receive this work.

3.02 PRIMING

Back paint all wood surfaces inaccessible and unexposed after installation before delivery with an approved linseed oil and aluminum primer.

- A. Prime coat all unfinished metal parts.
- B. Prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.03 FINISH CARPENTRY INSTALLATION

- A. Use only hot dip galvanized or aluminum finish or casting nails. Set nails for putty stopping in surface members. Hammer marks not acceptable on any exposed finished surface and may be cause rejection of Work by Architect.
- B. Make all end splices exposed in finished members bevel splices and not square butted. Install members in as long lengths as possible.
- C. Install Work to details shown, plumb, level and to line and securely anchored per AWI custom quality standard. Make scribes where required accurate. Miter corners of trim.
- D. Provide and install other miscellaneous millwork items and related Work required to complete Work of this Section.

- E. Prepare all woodwork installed hereunder by cleaning and sanding as required to receive finishes specified in Section "Painting and Finishing".
- F. Install all doors and frames; finish hardware and bathroom accessories per manufacturer's recommendation.
- G. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth and site finish.

***** END OF SECTION *****

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SECTION 07050
CONCRETE FLOOR TESTING

PART 1 - GENERAL

1.01 **GENERAL REQUIREMENTS**

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 **SUMMARY**

This Section includes the following:

1. Administrative and procedural requirements for testing interior concrete slabs for moisture vapor emission rate, alkalinity, and temperature and humidity.
2. Testing shall be conducted by the Owner's Testing Agency.

1.03 **RELATED DOCUMENTS**

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

1.04 **REFERENCES**

- A. ASTM F-1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor using Anhydrous Calcium Chloride.
- B. ASTM F-710 Standard Practice for Preparing Concrete Floors and other Monolithic Floors to receive Resilient Flooring.
- C. ASTM F-2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.05 **SUBMITTALS**

- A. Provide in accordance with Article 3.11 of the General Conditions.
- B. Reports: Reports of results of testing shall be submitted by the Owner's Testing Agency. Reports shall include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. For each test provide a record of interior temperature, humidity, moisture vapor emission, in-concrete relative humidity and alkalinity results for testing period.
 8. Test and inspection results and an interpretation of test results.
 9. Provide on the Architectural Floor Plan(s) as furnished by the Architect a test number identifying each test conducted.
 10. Name and signature of laboratory inspector.
 11. Recommendations on retesting and reinspecting.

1.06 COORDINATION

- A. Owner Responsibilities: Owner will engage a qualified testing agency to perform testing indicated.
1. Owner will furnish Construction Manager with name, address, and telephone number of testing agency.
 2. Payment for testing services will be made by the Owner directly to the testing agency.
 - a. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be paid by the Owner and charged to Contractor by an adjustment to the Contract Sum through a Change Order.
- B. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken.
 3. Perform tests and submit a certified written report of each test, inspection, and similar quality-control service to Owner, Architect, Construction Manager and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.
- C. Contractor Responsibilities: Coordinate sequence of activities to accommodate required testing services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities. Notify agency sufficiently in advance of operations to permit assignment of personnel.
 2. Acclimate enclosed spaces to the anticipated occupied temperature and humidity as required by the manufacturer of the specified flooring material(s) and in accordance with ASTM testing requirements.
 3. Cooperate with agencies performing required tests and inspections, provide reasonable auxiliary services as requested. Provide the following:
 - a. Access to the Work.
 - b. Incidental labor and facilities necessary to facilitate tests and inspections.
 - c. Security and protection for testing and inspecting equipment at Project site.
 4. Project Meeting: Schedule and conduct project meeting not less than 30 days prior to flooring installation to discuss testing requirements, specifications and locations prior to testing. Attendees shall include Owner, Architect, Construction Manager, Contractor, Testing Agency, and adhered floor installer representatives.

1.07 CLOSE-OUT: also comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports: Final Reports related to Item 1.06.
- B. As-Builts: Not required

- C. Operation and Maintenance Data: None required.
- D. Extra Materials: None required.
- E. Extended Warranty: Refer to specific Floor Finish Specification Sections for requirements. Comply with the requirements of the General Condition Article 3.5 and Section 01740.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment to be provided by Testing Agency.
- B. American Moisture Test, Inc. www.dometest.com (866) 670-9700
 - 1. ASTM F1869 Moisture Vapor Emission Test kits
 - 2. ASTM F-2170 In-Concrete Relative Humidity Testing System
 - 3. ASTM F-710 Alkalinity-pH wide range 1 – 14pH meter

PART 3 - EXECUTION

3.01 EXAMINATION

Site: Weatherproofed, doors installed and windows secured. Do not start testing process when site has standing water, surface contaminates, exposed to exterior conditions or concrete installation is less than 90 days of age.

3.02 PREPARATION

Contractor Responsibilities:

- 1. Preparation of Substrates:
 - a. Prepare concrete substrates according to ASTM requirements.
 - b. Verify that substrates are dry and free of curing compounds, sealers, and hardeners for vapor emission testing per ASTM F-1869.
 - c. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- 2. Temperature and Humidity: Maintain site at the temperature and humidity conditions to those anticipated during normal occupancy and maintain these conditions 48 hours prior and during testing period. If meeting this criteria is not possible, then minimum conditions should be 75± 10°F and 50± 10% relative humidity.
 - a. When a building is not under HVAC control, record temperature and humidity at start and end of testing using a portable data logging system.

3.03 TESTING

Testing: Testing Agency shall perform tests as follows:

- 1. Water vapor emission testing, ASTM F 1869.
 - a. Perform all gram scale weights on site.
 - b. Expose dome for 60 to 72 hours.
 - c. Report results as pounds of emission per 24 hours per ASTM F-1869.
 - d. Perform subfloor moisture testing in accordance with the Manufacturer's requirements for each floor system type. Do not proceed with flooring

installation until results of moisture tests are acceptable. All test results shall be documented and retained

2. In-Concrete Relative humidity testing, ASTM F 2170.
 - a. Satisfactory results shall have a maximum 75 percent relative humidity level measurement.
 3. Alkalinity Testing:
 - a. Apply neutral-pH solution to form a 1-inch diameter circle directly to interior of moisture dome.
 - b. Allow to absorb into concrete for 1 minute.
 - c. Apply flat tip pH meter to solution and document result as required by manufacturer.
 - d. Perform pH tests on concrete floors regardless of their age or grade level in accordance with the Manufacturer's requirements for each floor system type. PH level shall not exceed range of the Manufacturer's requirements for each floor system type. All test results shall be documented and retained
- B. Adhered floor coverings shall not be installed in areas where satisfactory test results have not been obtained.
- C. Consult Architect on remedial measures to reduce concrete levels prior to installing flooring. Installation of flooring deems acceptance of on-site conditions for a warranted application.

3.04 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
- B. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."
- C. Protect construction exposed by or for quality-control service activities.
- D. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 07050
CONCRETE FLOOR TESTING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 SUMMARY

This Section includes the following:

1. Administrative and procedural requirements for testing interior concrete slabs for moisture vapor emission rate, alkalinity, and temperature and humidity.
2. Testing shall be conducted by the Owner's Testing Agency.

1.03 RELATED DOCUMENTS

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

1.04 REFERENCES

- A. ASTM F-1869 Standard Test Method for Measuring Vapor Emission Rate of Concrete Subfloor using Anhydrous Calcium Chloride.
- B. ASTM F-710 Standard Practice for Preparing Concrete Floors and other Monolithic Floors to receive Resilient Flooring.
- C. ASTM F-2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

1.05 SUBMITTALS

- A. Provide in accordance with Article 3.11 of the General Conditions.
- B. Reports: Reports of results of testing shall be submitted by the Owner's Testing Agency. Reports shall include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. For each test provide a record of interior temperature, humidity, moisture vapor emission, in-concrete relative humidity and alkalinity results for testing period.
 8. Test and inspection results and an interpretation of test results.
 9. Provide on the Architectural Floor Plan(s) as furnished by the Architect a test number identifying each test conducted.
 10. Name and signature of laboratory inspector.
 11. Recommendations on retesting and reinspecting.

1.06 COORDINATION

- A. Owner Responsibilities: Owner will engage a qualified testing agency to perform testing indicated.
1. Owner will furnish Construction Manager with name, address, and telephone number of testing agency.
 2. Payment for testing services will be made by the Owner directly to the testing agency.
 - a. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be paid by the Owner and charged to Contractor by an adjustment to the Contract Sum through a Change Order.
- B. Testing Agency Responsibilities: Cooperate with Architect, Construction Manager, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, Construction Manager, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken.
 3. Perform tests and submit a certified written report of each test, inspection, and similar quality-control service to Owner, Architect, Construction Manager and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.
- C. Contractor Responsibilities: Coordinate sequence of activities to accommodate required testing services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities. Notify agency sufficiently in advance of operations to permit assignment of personnel.
 2. Acclimate enclosed spaces to the anticipated occupied temperature and humidity as required by the manufacturer of the specified flooring material(s) and in accordance with ASTM testing requirements.
 3. Cooperate with agencies performing required tests and inspections, provide reasonable auxiliary services as requested. Provide the following:
 - a. Access to the Work.
 - b. Incidental labor and facilities necessary to facilitate tests and inspections.
 - c. Security and protection for testing and inspecting equipment at Project site.
 4. Project Meeting: Schedule and conduct project meeting not less than 30 days prior to flooring installation to discuss testing requirements, specifications and locations prior to testing. Attendees shall include Owner, Architect, Construction Manager, Contractor, Testing Agency, and adhered floor installer representatives.

1.07 CLOSE-OUT: also comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports: Final Reports related to Item 1.06.
- B. As-Builts: Not required

- C. Operation and Maintenance Data: None required.
- D. Extra Materials: None required.
- E. Extended Warranty: Refer to specific Floor Finish Specification Sections for requirements. Comply with the requirements of the General Condition Article 3.5 and Section 01740.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment to be provided by Testing Agency.
- B. American Moisture Test, Inc. www.dometest.com (866) 670-9700
 - 1. ASTM F1869 Moisture Vapor Emission Test kits
 - 2. ASTM F-2170 In-Concrete Relative Humidity Testing System
 - 3. ASTM F-710 Alkalinity-pH wide range 1 – 14pH meter

PART 3 - EXECUTION

3.01 EXAMINATION

Site: Weatherproofed, doors installed and windows secured. Do not start testing process when site has standing water, surface contaminates, exposed to exterior conditions or concrete installation is less than 90 days of age.

3.02 PREPARATION

Contractor Responsibilities:

- 1. Preparation of Substrates:
 - a. Prepare concrete substrates according to ASTM requirements.
 - b. Verify that substrates are dry and free of curing compounds, sealers, and hardeners for vapor emission testing per ASTM F-1869.
 - c. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- 2. Temperature and Humidity: Maintain site at the temperature and humidity conditions to those anticipated during normal occupancy and maintain these conditions 48 hours prior and during testing period. If meeting this criteria is not possible, then minimum conditions should be 75± 10°F and 50± 10% relative humidity.
 - a. When a building is not under HVAC control, record temperature and humidity at start and end of testing using a portable data logging system.

3.03 TESTING

Testing: Testing Agency shall perform tests as follows:

- 1. Water vapor emission testing, ASTM F 1869.
 - a. Perform all gram scale weights on site.
 - b. Expose dome for 60 to 72 hours.
 - c. Report results as pounds of emission per 24 hours per ASTM F-1869.
 - d. Perform subfloor moisture testing in accordance with the Manufacturer's requirements for each floor system type. Do not proceed with flooring

installation until results of moisture tests are acceptable. All test results shall be documented and retained

2. In-Concrete Relative humidity testing, ASTM F 2170.
 - a. Satisfactory results shall have a maximum 75 percent relative humidity level measurement.
 3. Alkalinity Testing:
 - a. Apply neutral-pH solution to form a 1-inch diameter circle directly to interior of moisture dome.
 - b. Allow to absorb into concrete for 1 minute.
 - c. Apply flat tip pH meter to solution and document result as required by manufacturer.
 - d. Perform pH tests on concrete floors regardless of their age or grade level in accordance with the Manufacturer's requirements for each floor system type. PH level shall not exceed range of the Manufacturer's requirements for each floor system type. All test results shall be documented and retained
- B. Adhered floor coverings shall not be installed in areas where satisfactory test results have not been obtained.
- C. Consult Architect on remedial measures to reduce concrete levels prior to installing flooring. Installation of flooring deems acceptance of on-site conditions for a warranted application.

3.04 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
- B. Comply with the Contract Document requirements for Division 01 Section "Cutting and Patching."
- C. Protect construction exposed by or for quality-control service activities.
- D. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

*****END OF SECTION*****

SECTION 07190
ANTI-GRAFFITI & WATER REPELLENT PROTECTION

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 SUMMARY

Section includes application of water repellents to protect masonry & concrete site wall surfaces.

1.01 REFERENCES

- A. ASTM D 2369-92 - Test Methods for Volatile Content of Coatings.
- B. ASTM D 3960-93 - Practice for Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- C. Federal Specification SS-W-110C - Water Repellent, Colorless Silicon, Resin Base.

1.02 QUALITY ASSURANCE

A. Applicator Qualifications:

- 1. Experienced in the application of the specified products.
- 2. Employs persons trained for the application of the specified products.

B. Pre-Application Meeting: Convene a pre-application meeting two weeks before the start of application of water repellents. Require attendance of parties directly affecting work of this section, including the Contractor, Architect, applicator, and a PROSOCO representative. Review environmental regulations, test panel procedures, protection of surrounding areas and non-masonry surfaces, surface preparation, application, field quality control, final cleaning, and coordination with other work.

1.03 ENVIRONMENTAL REGULATIONS

Comply with applicable federal, state, and local environmental regulations.

1.04 SUBSTITUTIONS

Substitutions will be considered per General Condition Article 3.11.4 and Section 01630.

1.05 SUBMITTALS

A. Provide in accordance with Article 3.11 of the General Conditions.

B. Submit manufacturer's product data sheets on all products to be used for the work. Submit description for protection of surrounding areas and non-masonry surfaces, surface preparation, application, and final cleaning.

C. Applicator Qualifications: Submit qualifications of applicator.

- 1. Certification stating applicator is experienced in the application of the specified products.
- 2. List of recently completed water repellent projects, including project name and location, names of owner and architect, and description of products used, substrates, applicable local environmental regulations, and application procedures.

D. Environmental Regulations: Submit applicable local environmental regulations.

E. Test Panels

- 1. Before full scale application, review manufacturer's product data sheets to determine

the suitability of each product for the specific surfaces. Apply each water repellent to test panels to determine number of applications, coverage rates, compatibility, effectiveness, surface preparation, application procedures, and desired results.

2. Apply water repellents to test panels in accordance with manufacturer's written instructions. Allow 48 hours or until test panels are thoroughly dry before evaluating final appearance and results. Do not begin full scale application until test panels are inspected and approved by the Architect.
3. Test Panel Requirements:
 - a. Size: Minimum 4 feet by 4 feet each.
 - b. Locations: As determined by the Architect.
 - c. Number: As required to completely test each water repellent with each type of substrate to be protected.
4. Retain and protect test panels approved by the Architect in undisturbed condition during the work of this section, to be used as a standard for judging the water repellent work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with the requirements of Section 01620.
- B. Delivery: Deliver materials to site in manufacturer's original, unopened container and packaging, with labels clearly identifying product name and manufacturer.
- C. Storage and Handling: Store containers upright in a cool, dry, well ventilated place, out of the sun. Store away from all other chemicals and potential sources of contamination. Keep lights, fire, sparks, and heat away from containers. Do not drop containers or slide across sharp objects. Keep containers tightly closed when not in use. Store and handle materials in accordance with manufacturer's written instructions.

1.07 PROJECT CONDITIONS

- A. Temperature Limitations:
 1. Do not apply at surface and air temperatures below 40°F or above 95°F, unless otherwise indicated by manufacturer's written instructions.
 2. Do not apply when surface and air temperatures are not expected to remain above 40°F for a minimum of 8 hours after application, unless otherwise indicated by manufacturer's written instructions.
- B. Do not apply under windy conditions such that water repellent may be blown to surfaces not intended.
- C. Do not apply to frozen substrate. Allow adequate time for substrate to thaw, if freezing conditions exist before application.
- D. Do not apply earlier than 24 hours after rain or if rain is predicted for a period of 8 hours after application, unless otherwise indicated by manufacturer's written instructions.

1.08 CLOSE-OUT: also comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports:
None required.
- B. As-Builts:
Not required.
- C. Operation and Maintenance Data:

None required.

D. Extra Materials:

None required.

E. Extended Warranty:

Comply with the requirements of General Condition Article 3.5 and Section 01740.

PART 2 -- PRODUCTS

2.01 MANUFACTURER

Prosoco, Inc., PO Box 171677, Kansas City, Kansas 66117, (800) 255-4255

2.02 WATER REPELLENTS / NON-SACRIFICIAL GRAFFITI PROTECTION

A. "Weather Seal Blok-Guard & Graffiti Control II" is a clear-drying , water-based silicone emulsion formulated to weatherproof masonry and concrete and protect from repeated graffiti attacks without altering natural appearance.

B. Active Solids: 6%

Form: Milky liquid

Specific Gravity: 1.0

Flash Point: >212 degrees F

PART 3 -- EXECUTION

3.01 EXAMINATION

A. Examine the areas and conditions under which work of this Section will be performed.

B. Verify by examination that brick masonry and concrete surfaces are acceptable to receive the specified water repellents.

C. Correct conditions detrimental to timely and proper completion of the Work.

D. Do not proceed until unsatisfactory conditions are corrected.

E. Beginning of installation means acceptance of conditions.

3.02 PROTECTION

A. Protect surrounding areas, landscaping, building occupants, pedestrians, vehicles, and non-masonry surfaces during the work from contact with water repellents, masonry or concrete cleaners if used, residues, rinse water, fumes, wastes, and effluents in accordance with manufacturer's written instructions.

B. Apply water repellents after protection of windows.

C. Divert and protect pedestrian and auto traffic.

3.03 SURFACE PREPARATION

A. Clean all dirt, dust, oil, grease, and other contaminants from surfaces that interfere with penetration or performance of water repellents. Use appropriate masonry or concrete cleaners approved by the water repellent manufacturer where necessary. Rinse thoroughly using pressure water spray to remove cleaner residues. Allow surfaces to dry completely before application of water repellents.

B. Repair, patch, and fill all cracks, voids, defects, and damaged areas in surface as approved by the Architect. Allow repair materials to cure completely before application of water

repellents.

- C. Apply specified sealants and caulking and allow to cure completely before application of water repellents.
- D. Seal all open joints.
- E. Allow new masonry and concrete construction and repointed surfaces to cure for minimum of 28 days before application of water repellents.

3.04 APPLICATION

- A. Apply water repellents to substrates in accordance with manufacturer's written instructions, environmental regulations, and application procedures determined from test panel results approved by the Architect.
- B. Apply to clean, dry, cured, and properly prepared surfaces approved by the Architect.
- C. Consult manufacturer's written instructions for information on application equipment to be used and precautions to be taken with the specified products.
- D. Do not dilute or alter water repellents. Apply as packaged.
- E. Do not apply to below-grade surfaces.
- F. Do not apply to asphalt or other non-masonry materials.
- G. Do not apply to painted surfaces.
- H. Do not apply to compensate for structural or material defects in substrates.
- I. Avoid overspray, wind drift, and splash of water repellents.

3.05 FIELD QUALITY CONTROL

- A. Inspection: Inspect the water repellent work with the Contractor, Architect, applicator, and Prosoco representative, and compare with test panel results approved by the Architect. Determine if the substrates are suitably protected by the water repellents.
- B. Manufacturer's Field Services: Provide the services of a manufacturer's authorized field representative to verify specified products are used, and protection, surface preparation, and application of water repellents are in accordance with the manufacturer's written instructions and the test panel results approved by the Architect.

3.06 FINAL CLEANING

- A. Clean site of all unused water repellents, residues, rinse water, wastes, and effluents in accordance with environmental regulations.
- B. Remove and dispose of all materials used to protect surrounding areas and non-masonry surfaces, following completion of the work of this section.
- C. Repair, restore, or replace to the satisfaction of the Architect, all materials, landscaping, and non-masonry surfaces damaged by exposure to water repellents.

END OF SECTION

SECTION 07210
THERMAL INSULATION

PART 1 -- GENERAL

1.01 **GENERAL REQUIREMENTS**

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section

1.02 **SCOPE OF WORK**

A. Furnish and install Thermal Insulation indicated on the Drawings and as specified herein.

B. The principal items of work include:

1. Thermal Insulation within roof.
2. Thermal Insulation within exterior walls.
3. Thermal Insulation within interior walls.

1.03 **QUALITY ASSURANCE**

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

B. Upon completion of this portion of the Work, complete and post a certificate of insulation compliance in accordance with pertinent requirements of governmental agencies having jurisdiction.

1.04 **SUBSTITUTIONS**

Substitutions will be considered per Article 3.3 of the Instruction to Bidders of the Bid Package Section 00003.

1.05 **SUBMITTALS**

A. Provide in accordance with Article 3.11 of the General Conditions.

B. Product data:

1. Materials list of items to be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.

1.06 **PRODUCT HANDLING**

Comply with the requirements of Section 01620.

1.07 **CLOSE-OUT**: also comply with the requirements of Section 01770 – Contract Closeout.

A. **Reports**:

Provide Certification per Item 1.03.B.

B. **As-Builts**:

Not required

C. **Operation and Maintenance Data**:

None required.

D. Extra Materials:

None required.

E. Extended Warranty:

1. Comply with the requirements of General Condition Article 3.5 and Section 01740.
2. Warranties listed in this Section shall be in addition to, and not a limitation of other rights the owner may have under the contract documents.
3. Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than FIVE (5) years from the date the Owner records Notice of Completion.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Provide thermal insulation as indicated on Drawings.
- B. All insulation shall be inorganic glass fiber insulation. Insulation shall comply with ASTM Testing Standards. Fire Hazard Classification, Flame Spread Index, Smoke Developed Index, Combustibility, and Fire Endurance Ratings as required by Code.
- C. Insulation shall be as manufactured by Certainteed, Johns-Manville, Owens-Corning, or Architect approved equal.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.
- E. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

- A. Verify adjacent materials are dry and ready to receive installation.
- B. Verify mechanical and electrical services within walls have been installed and tested.

3.03 INSPECTION

- A. Before any installation is started, determine that the other work is suitable to receive insulation.
- B. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- C. Remove or protect against projections in construction framing that may damage or prevent proper insulation.

3.04 INSTALLATION

- A. All work shall be performed by licensed applicators, shall comply with the recommendations of the manufacturer and the National Association of Insulation Manufacturers.

- B. Install insulation with factory applied membrane facing warm side of building spaces. Lap ends and side flanges of membrane over and between framing numbers. Secure in place. Tape seal butt ends and lapped side flanges. Tape seal tears or cuts in membrane.
- C. Trim insulation neatly to fit spaces. Use batts free of damage. Install batt insulation, in wall spaces without gaps or voids.
- D. Install Insulation in all indicated walls from floor to underside of roof. Secure insulation with 19-gage wire or 1" wide, 20 gage steel strips. Architect shall approve all insulation details, including methods of fastening, before commencement of the work.

3.05 CLEAN UP AND DISPOSAL

At frequent intervals during and again upon completion of work, remove from building and working premises tools and equipment, surplus materials, all rubbish and debris of whatever nature not caused by other trades, and leave the work in a clean, orderly and acceptable condition approved by the Architect.

***** END OF SECTION *****

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SECTION 07600

FLASHING & SHEET METAL

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 SCOPE OF WORK

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

- A. All metal wall flashings, related flashing, coping and caps.
- B. Flashing at curbed openings, and other miscellaneous areas where indicated on the drawings.
- C. Flashing flanges for roof drains and overflows.
- D. Flashing at parapet walls that receive roofing membrane.
- E. Flashing and metal covers at mechanical equipment platforms.
- F. Gutters and downspouts.
- G. Shop and field priming, shop painting, galvanizing, screening, caulking, anchors and anchor straps, clips, etc.
- H. Shop drawings of all sheet metal work including expansion joints.

1.03 QUALITY ASSURANCE

- A. Verify drawing dimensions with actual field conditions. Inspect related work and adjacent surfaces.
- B. Report to the Architect all conditions that prevent proper execution of this work.

1.04 SUBSTITUTIONS

Substitutions will be considered per Article 3.3 of the Instruction to Bidders of the Bid Package Section 00003.

1.05 SUBMITTALS

- A. Provide in accordance with Article 3.11 of the General Conditions.
- B. Shop Drawings: submit: all information required for fabrication, finishing and installation of this work in complete details.

1.06 PRODUCT HANDLING

Adhere to requirements of Section 01620.

1.07 CLOSE-OUT: also comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports:
None required.
- B. As-Builts:
Comply with the requirements of Section 01770 – Contract Closeout.

C. Operation and Maintenance Data:

None required.

D. Extra Materials:

None required.

E. Extended Warranty:

1. Comply with the requirements of General Condition Article 3.5 and Section 01740.
2. Warranties listed in this Section shall be in addition to, and not a limitation of other rights the owner may have under the contract documents.
3. Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than FIVE (5) years from the date the Owner records Notice of Completion.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Galvanized Sheet Metal: Conform to ASTM A525, thickness indicated or specified, but not less than 24-gauge. Zinc coating shall weigh not less than 1-1/2 ounces, or more than 1-1/2 ounces per square foot of surface covered.
- B. Solder: Standard Grade-A brand of 50:50 Alloy Lead-Tin, complying with ASTM B32. Name of manufacturer and grade designation shall be cast or die-marked on each bar.
- C. Solder Flux: Raw muratic acid for galvanized metal and zinc; resin for tin, lead, and tinned copper; and non-corrosive soldering salts for uncoated copper.
- D. Sheet Metal Fasteners: Rivets, nails, sheet metal screws, self-tapping screws, and stove bolts, of the type and size best adapted to the condition of use. Provide fasteners of the type specified or indicated.
 1. Use: galvanized steel, cadmium-plated steel or 300 Series alloy stainless steel.
 2. Pop rivets may be used for metal-to-metal connections when future disassembly is not required. Open-end type may be used for all applications except where watertight connections are required, in which case, use closed end type.
- E. Caulking Compound: Provide as specified under Section 07900. Apply as recommended by the manufacturer; caulking compound of proper consistencies for gun and knife application as necessary.
- F. Shop Prime Coat: Rust-Oleum Corporation. Apply #3202 to 1/2 mil wet coating thickness, #3268 to 1-mil dry coating thickness or provide primer as specified under Section 09900.
- G. Shop Color Coat: Pre-coat in shop with coating of color to match adjoining surfaces.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.
- E. Beginning of installation means acceptance of conditions.

3.02 FABRICATION AND ASSEMBLY

- A. **Workmanship:** Fabricate and finish metal work in a first class manner in accordance with best trade practices with all joints and corners accurately machined, filed and fitted, and rigidly framed together and connected. Carefully match components to produce perfect continuity of line and design. Make joints and connections in exterior face metal watertight, using approved scaling materials and methods of assembly. Fit faces of metal in contact with hairline joints, except as otherwise indicated or required for expansion or fitting. Conceal fastenings, unless otherwise indicated. Conceal required reinforcements within the finished assembly.
- B. **Expansion and Contraction:** Form and fabricate work to adequately provide for thermal expansion and contraction and building movement in the completed work, without overstressing the materials, breaking connections, or producing wrinkles and distortion in finished surfaces. Finish sheet metal work water and weathertight throughout.
- C. **Attachment Clips:** Where subject to thermal expansion and contraction, attach members with clips to permit movement without damage to the installation, or provide slotted or over-size holes with washers where appearance is not critical, as approved by the Architect.
- D. **Lock Seams:** Make lock seam work flat and true to line; sweat full of solder except where installed to permit expansion and contraction. Lap flat lock seams, and lap seams where soldered, according to pitch but in no case less than 4". Make seams in direction of flow. Fill expansion joints with sealant. Plane surfaces shall be free of buckles. Provide reinforcement as necessary. Cleat and fasten substantially on approximately eight-inch centers. All cap flashing and gutter seams to be flat lock seams.
- E. **Soldering:** Thoroughly clean and tin material prior to soldering. Solder with heavy coppers of blunt design, properly tinned before use. For flat seam work they shall not weight less than ten pounds per pair, and for other work not less than size pounds per pair. Solder slowly with well-heated coppers, heating the seams thoroughly and completely filling them with solder. Finish surfaces neatly, full flowing and smooth. Wash acid flux thoroughly with a soda solution after soldering and completely remove soldering flux on exposed surfaces.
- F. **Welding:** Conform to the requirements of AWS "Standard Code for Arc and Gas Welding". Perform welding in a manner resulting in strong, durable, tight, flush, smooth, and clean joints. Weld sheet steel to produce full and complete fusion welds without inducing locked-in stresses in the metal or surface distortions. Welding on exposed surfaces shall be ground smooth and flush and finished to match adjacent surfaces.
- G. **Caulking:** Where indicated, caulk joints in sheet metal work and between sheet metal work and adjacent construction with polysulfide sealing compound. Apply in accordance with Caulking and Sealants Section.
- H. **Coping:** Shall be attached to top of parapets in strict conformance with the latest written specifications of the Sheet Metal Industry Fund of Los Angeles, and as indicated on the drawings.
- I. All sheet metal work shall be examined carefully the Contractor, Owner and Architect and if necessary, tested. The Contractor shall make all repairs to damaged items as a result of this testing, leaving them in a condition satisfactory to the Architect.

*** END OF SECTION ***

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SECTION 07900
CAULKING & SEALANTS

PART 1 -- GENERAL

1.01 **GENERAL REQUIREMENTS**

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 **SCOPE OF WORK**

Work included: Throughout the work, seal and caulk joints where shown on the Drawings and elsewhere as required to provide a positive barrier against passage of moisture and passage of air.

1.03 **QUALITY ASSURANCE**

- A. Conform to Sealant and Waterproofers Institute requirements for materials and installation.
- B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.
- C. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

1.04 **SUBSTITUTIONS**

Substitutions will be considered per Article 3.3 of the Instruction to Bidders of the Bid Package Section 00003.

1.05 **SUBMITTALS**

- A. Provide in accordance with Article 3.11 of the General Conditions.
- B. Product data: submit:
 - 1. List of items that will be provided under this Section.
 - 2. Manufacturer's Data: catalog cuts, dimensioned drawings, and other data needed to prove compliance with the specified requirements.
 - 3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.06 **PRODUCT HANDLING**

Comply with the requirements of Section 01620.

1.07 **CLOSE-OUT**: also comply with the requirements of Section 01770 – Contract Closeout.

A. **Reports**:

None required.

B. **As-Builts**:

Not required.

C. **Operation and Maintenance Data**:

None required.

D. **Extra Materials**:

Provide for Owner's use a minimum of 2 percent, but not less than one tube, of the each of the sizes and colors used, boxed and clearly labeled.

E. Extended Warranty:

1. Comply with the requirements of General Condition Article 3.5 and Section 01740.
2. Warranties listed in this Section shall be in addition to, and not a limitation of other rights the owner may have under the contract documents.
3. The guarantee specified herein shall include warranties against leakage, hardening, cracking, crumbling, melting, running, shrinking or staining adjacent surfaces.
4. Contractor Guarantee: Contractor guarantees the work covered by this specification against all defects in material and workmanship for a period of not less than five (5) years from the date of Substantial Completion.

PART 2 -- PRODUCTS

2.01 SEALANTS

A. Except as specifically otherwise accepted by the Architect, use only the types of sealants described as follows:

1. One component polyurethane sealant, moisture curing, low modulus, FS TT-S-0023OC, Type II, Class A, ASTM-C-920, Class 25, for vertical and horizontal joints in connection with all building materials. Do not use in traffic areas. Minimum 1/4" joint; maximum 1-1/4" x 3/8"d.
 - a. Dymonic by Tremco
 - b. Sonolastic NP1 by Sonneborn
2. One-part silicone sealant, moisture curing, low modulus, FS TT-S-0023OC, Type II, Class A, FS TT-S-001543A, Class A, for vertical and horizontal joints in connection with aluminum, glass and concrete materials which require greater movement capabilities. Do not use in traffic areas. Minimum joint 1/4" x 3/16"d; maximum 1" x 1/2"d.
 - a. Spectrum 1 by Tremco
 - b. Omniseal by Sonneborn
 - c. Dow Corning 790
3. One-part silicone sealant, medium modulus, neutral cure, FS S-0023OC, Type II, Class A, FS TT-S-001543A, Type II, Class A, ASTM C920, Class 25, for vertical and horizontal joints in connection with non-porous surfaces such as aluminum, glass, tile, laminated plastic and concrete. Do not use in traffic areas.
 - a. Spectrum 2 by Tremco
 - b. Omni Plus by Sonneborn
 - c. Dow Corning 795
 - d. Construction 1200 by GE
4. Multi-Component polyurethane sealant, FS TT-S-00227E, Type I, Class A, ASTM C920 for horizontal joints in traffic areas. Minimum 3/8" wide, depth to be 3/8" to 1/2" - use primer.
 - a. THC-900/901 by Tremco
 - b. Chem. Caulk 950 by Bostick
5. One-part translucent silicone sealant, low modulus, moisture curing, FS TT-S-0023OC, Type II, Class A, FS TT-S-001543A, Type II, Class A, for vertical joints in

connection with butt glazing.

- a. 895 Silicone by Pecora
 - b. Silglaze N by GE
6. One-part mildew resistant silicone sealant meeting requirements of FDA Regulation 21 CFR 177.2600, for vertical and horizontal joints in connection with non-porous applications as sealing around bathroom fixtures, shower-tub enclosures, sinks and urinals.
- a. Dow Corning 786
 - b. Sanitary 1700 by GE
7. One-part siliconized acrylic latex polymer caulk, ASTM C834-76, for interior horizontal and vertical joints in connection with window and door buck perimeters, interior wall surfaces, etc.
- a. AC-20 by Pecora
 - b. Acrylic Latex by Tremco
8. Roof Penetrations: Use asphalt mastic conforming to ASTM D491.
9. For other services, provide products especially formulated for the proposed use and accepted in advance by the Architect.

B. Colors:

1. The Architect will select Colors for each sealant installation to match adjacent finishes from a standard color list normally available from the specified manufacturers.
2. Should a matching standard color not be available from the accepted manufacturer except at additional charge, the Contractor shall provide such colors at no additional cost to the Owner.
3. In concealed installations, and in partially or fully exposed installations where so accepted by the Architect, use standard gray or black sealant.

2.02 PRIMERS

Use only those primers that are: non-staining, have been tested for durability on the surfaces to be sealed, and are specifically recommended for this installation by the manufacturer of the sealant used.

2.03 BACKUP MATERIALS

- A. Use only those backup materials that are specifically recommended for this installation by the manufacturer of the sealant used, which are non-absorbent, and which are non-staining.
- B. Acceptable types include:
1. Closed-cell resilient urethane or polyvinyl chloride foam;
 2. Closed-cell polyethylene foam;
 3. Closed-cell sponge of vinyl or rubber;
 4. Polychloroprene tubes or beads;
 5. Polyisobutylene extrusions;
 6. Oil-less dry jute.
- C. Preformed support strips for ceramic tile control joint and expansion joint work: Use polyisobutylene or polychloroprene rubber.

2.04 BOND-PREVENTATIVE MATERIALS

Use only one of the following as best suited for the application, and as recommended by the manufacturer of the sealant used:

1. Polyethylene tape, pressure-sensitive adhesive, with the adhesive required only to hold tape to the construction materials as indicated;
2. Aluminum foil complying with MIL-A-148E;
3. Wax paper complying with Fed. Spec. UU-P-270.

2.05 JOINT PACKING

Shall be installed in all joints to receive sealant. Material shall be a resilient type such as closed cell PVC foam or as recommended by the manufacturer. Oakum or other types of absorptive materials shall not be used as packing material.

2.06 OTHER MATERIALS

- A. For masking around joints, provide masking tape complying with Fed. Spec. UU-T-106c.
- B. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the acceptance of the Architect.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.
- E. Beginning of installation means acceptance of conditions.

3.02 PREPARATION

- A. Concrete and ceramic tile surfaces:
 1. Install only on surfaces that are dry, sound, and well brushed, wiping free from dust.
 2. At open joints, remove dust by mechanically blown compressed air if so required.
 3. Use solvent to remove oil and grease, wiping the surfaces with clean rags.
 4. Where surfaces have been treated, remove the surface treatment by sandblasting or wire brushing.
 5. Remove laitance and mortar from joint cavities.
 6. Where backstop is required, insert the approved backup material into the joint cavity to the depth needed.
- B. Steel surfaces:
 1. Steel surfaces in contact with sealant:
 - a. Sandblast as required to achieve acceptable surface for bonding.
 - b. If sandblasting is not practical, or would damage adjacent finish, scrape the metal or wire brush to remove mill scale.
 - c. Use solvent to remove oil and grease, wiping the surfaces with clean rags.
 2. Remove protective coatings on steel by sandblasting or by using a solvent that leaves

no residue.

C. Aluminum surfaces:

1. Remove temporary protective coatings, dirt, oil, and grease.
2. When masking tape is used for protective cover, remove the tape just prior to applying the sealant.
3. Use only such solvents to remove protective coatings as are recommended for that purpose by the manufacturer of the aluminum work, and which are non-staining.

3.03 INSTALLATION OF BACKUP MATERIAL

- A. Use only the backup material recommended by the manufacturer of the sealant used, and accepted by the Architect for the particular installation, compressing the backup material 25% to 50% to achieve a positive and secure fit.
- B. When using backup of tub or rod stock, avoid lengthwise stretching of the material. Do not twist or braid hose or rod backup stock.
- C. Interior and exterior joints where no backing has been provided or which is in excess of 3/4" deep shall be packed by this subcontractor with fiberglass or a suitable joint filler to reduce the depth to 1/2" maximum. Maximum movement: the width of the joint shall be at least four times its maximum movement.

3.04 PRIMING

- A. Use only the primer recommended by the manufacturer of the sealant, and accepted by the Architect for the particular installation, applying in strict accordance with the manufacturer's recommendations as accepted by the Architect.
- B. The priming of joints shall be by brush to reach all surfaces to which compound will be applied. Primer shall be provided on masonry, concrete and wood surfaces as recommended by sealant manufacturer. Primer shall not be applied to surfaces that will be exposed after caulking is completed.

3.05 BOND-BREAKER INSTALLATION

Provide an approved bond-breaker where recommended by the manufacturer of the sealant, and where directed by the Architect, adhering strictly to the installation recommendations as accepted by the Architect.

3.06 INSTALLATION OF SEALANTS

- A. Prior to start of installation in each joint, verify the joint type according to details on the Drawings, or as otherwise directed by the Architect, and verify that the required proportion of width of joint to depth of joint has been secured.
- B. Equipment:
 1. Apply sealant under pressure with power-actuated or hand gun, or by other appropriate means.
 2. Use guns with nozzle of proper size, and providing sufficient pressure to completely fill the joints as designed.
- C. Thoroughly and complete mask joints where the appearance of sealant on adjacent surfaces would be objectionable.
- D. Install the sealant in strict accordance with the manufacturer's recommendations as accepted by the Architect, thoroughly filling joints to the recommended depth.
- E. Tool joints to the profile shown on the Drawings, or as otherwise required if such profiles are not shown on the Drawings.

F. Cleaning up:

1. Remove masking tape immediately after joints have been tooled.
2. Clean adjacent surfaces free from sealant as the installation progresses, using solvent or cleaning agent recommended by the manufacturer of the sealant used.
3. The excess material shall be cleaned from the surfaces adjacent to the joint, following the caulking operation and the top of the compound deposit shall be left with a smooth even finish. No material is permitted on the exposed face of aluminum sections.

***** END OF SECTION *****

SECTION 08100

METAL DOORS AND FRAMES

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 SCOPE OF WORK

Work under this section comprises of furnishing hollow metal doors and frames, including transom frames, sidelight and window frames with provision for glazed, paneled or louvered openings, fire labeled and non-labeled, as scheduled.

1.03 REFERENCES

A. Standards:

1. 2010 NFPA 80 – Fire Doors and Window
2. ANSI/SDI-100 – Recommended Specifications for Standard Steel Doors an Frames
3. ASTM-F 476 – Standard Test Methods for Security of Swinging Doors Assemblies
4. HMMA 862 – Guide Specifications for Commercial Security Hollow Metal Doors and Frames
5. SDI-105 – Recommended Erection Instructions for Steel Frames
6. SDI-107 – Hardware on Steel Doors (reinforcement application)
7. ANSI-A250.4 – Steel Doors and Frames Physical Endurance
8. UL10C - Standard for Positive Pressure Fire Tests of Door Assemblies
9. UL752 – Ballistic Standards

B. Codes:

1. 2009 NFPA-101 – Life Safety Code
2. 2009 CBC – California Building Code
3. ANSI-A117.1 – Accessible and Usable Building and Facilities
4. 2010 DOJ – ADA Standards for Accessible Design - DOJ

1.04 QUALITY ASSURANCE

- A. Manufacturer shall be a member in good standing of the Steel Door Institute (SDI).
- B. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- C. Unless specifically otherwise accepted by the Architect, provide all products of this Section from a single manufacturer.
- D. Fire Rated Door Assemblies:
 1. All labeled fire door assemblies to be of a type that have been classified and listed in accordance with the latest edition of NFPA80 and test in compliance with NFPA-252, and UL10C. A physical label is to be affixed to the fire door at an authorized facility; embossed labels are acceptable on standard 3 sided door frames.

2. For openings required to be fire rated exceeding limitations of labeled assemblies, submit manufacturer's certification that each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.
3. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with hardware and other door manufacturers to ensure that total opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies.
4. Certification(s) of compliance shall be made available upon request by the Authority Having Jurisdiction.

1.05 SUBSTITUTIONS

Substitutions will be considered per Article 3.3 of the Instruction to Bidders of the Bid Package Section 00003.

1.06 SUBMITTALS

A. Provide in accordance with Article 3.11 of the General Conditions.

B. Product data: submit:

1. List of items that will be provided under this Section.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Manufacturer's recommended installation procedures which, when accepted by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the Work.
4. Provide a schedule of doors and frames using same reference numbers for details and door openings as those on the contract documents.
5. Submit shop drawings. Shop drawings should include the following information:
 - a. Material thickness and/or gauge.
 - b. Door core material.
 - c. Mortises and reinforcements.
 - d. Anchorage types.
 - e. Locations of exposed fasteners.
 - f. Glazed, louvered and paneled openings.
 - g. Mounting locations of standard hardware

1.07 DELIVERY, STORAGE, AND HANDLING

A. Adhere to requirements of Section 01620.

B. The supplier shall deliver all materials to the project site; direct factory shipments are not allowed unless agreed upon beforehand. Supplier shall coordinate delivery times and schedules with the contractor.

C. Deliver doors cardboard wrapped or crated to provide protection during transit and jobsite storage. Provide additional protection to prevent damage to any factory-finished doors. Mark all doors and frames with opening numbers as shown on the contract documents and shop drawings.

D. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to the architect. Otherwise, remove and replace damaged goods as directed.

E. Store doors and frames at the building site in a dry and secure place.

1. Place units on minimum 4" high wood blocking.
2. Avoid use of non-vented plastic or canvas shelters that could create a humidity chamber.
3. If cardboard wrapper on door becomes wet, remove carton immediately.
4. Provide 1/4" spaces between stacked doors to promote air circulation.

1.08 CLOSE-OUT: Comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports: None required.
- B. As-Builts: Comply with the requirements of Section 01770 – Contract Closeout.
- C. Operation and Maintenance Data: None required
- D. Extra Materials: None required
- E. Extended Warranty: Comply with the requirements of the General Condition Article 3.5 and Section 01740.
 1. Warranties listed in this Section shall be in addition to, and not a limitation of other rights the owner may have under the contract documents.
 2. All doors and frames shall be warranted in writing by the manufacturer against defects in materials and workmanship for a period of one (1) year commencing on the date of final completion and acceptance.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with requirements, provide standard hollow metal doors and frames by one of the following:

- A. Security Metals, Door Components, Ceco Corporation, Curries Company, Steelcraft Company.

2.02 MATERIALS

- A. All doors and frames shall be manufactured of commercial quality cold rolled steel per ASTM-A366 and A568 general requirements; galvanized to A60 or G60 or galvanealed to A40 minimum coating weight standard per ASTM-A924. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM-A569
- B. Supports and anchors shall be fabricated of not less than 18-gauge sheet steel, galvanized where galvanized frames are used.
- C. Where items are to be built into exterior walls, inserts, bolts and fasteners shall be hot dipped galvanized in compliance with ASTM-A153, Class C or D as applicable.
- D. Rust inhibitive enamel or paint primer shall be used, baked on, and suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces on Steel Doors and Frames."
- E. Where specified supply embossed steel doors with wood grain appearance. Wood grain shall follow the pattern of a stile and rail wood door with both vertical and horizontal grain patterns. Doors with vision lites are required to have wood grain window kits.
- F. Finish: See Door & Hardware Schedule and Finish Schedules.

2.03 METAL DOORS

- A. Provide 1 3/4" thick doors of materials and ANSI/SDI-100 grades and models specified below, or as indicated on drawings or schedules:

1. Interior Doors: Level 2, Model 2 – Seamless

Interior doors shall be minimum 16-gauge steel with both lock and hinge rail edge of door intermittently welded, filled and ground smooth the full height of door. Acceptable Manufacturers/Products:

- a. Ceco: Regent-16-SEM
- b. Curries: 707N-16
- c. Steelcraft: LF16
- d. Architect Approved Equal

2. Exterior Doors: Level 3, Model 2 – Seamless

Exterior doors shall be minimum 16-gauge galvanized or galvanealed steel with both lock and hinge rail edge of door intermittently welded, filled and ground smooth the full height of door. Exterior doors shall be insulated with a solid slab of expanded polystyrene or polyurethane foam permanently bonded to the inside of each face skin. The top of all doors shall be closed flush by the addition of a 16-gauge screwed-in top cap and sealed to prevent water infiltration. The bottom channel shall include weep-holes. Acceptable Manufacturers/Products:

- a. Ceco: Legion-16-SEM
- b. Curries: 707N-16
- c. Steelcraft: LF16-Polystyrene
- d. Architect Approved Equal

3. Security Doors: Level 3, Model 2 – Seamless

Doors shall be minimum 14-gauge steel with both lock and hinge rail edge of door continuously wire welded the entire height of the door. Doors shall be reinforced, stiffened, insulated, and sound deadened with continuous 20 gauge vertical steel stiffeners spaced not more than 6" (152) apart. The stiffener ends shall be welded together at the top and bottom ends. All spaces between stiffeners shall be insulated with .75 pound density fiberglass insulation. The top of all doors shall be closed flush by the addition of a 14-gauge screwed-in top cap and sealed to prevent water infiltration. The bottom channel shall include weep-holes. Acceptable Manufacturers/Products:

- a. Ceco: Medallion-14
- b. Curries: 747T-14
- c. Steelcraft: BW14
- d. Architect Approved Equal

4. Bullet Resistant Doors

- a. Bullet resistant hollow metal doors shall be constructed with vertical steel stiffeners and fully welded vertical edge seams for enhanced strength and aesthetic appearance. Internal door construction and concealed armor plate shall vary and is dependent on the required ballistic rating. Provide ballistic level doors as follows:

- i. Level 1: Super 38 Automatic
- ii. Level 2: .357 Magnum Revolver
- iii. Level 3: .44 Magnum Revolver
- iv. Level 4: 30-06 Rifle

- b. Subject with compliance to the outline requirements, provide products by the following manufacturers:

- i. Ceco: Armorshield
- ii. Curries: 847/857
- iii. Security Metals

iv. Architect Approved Equal

- B. All doors shall be reinforced for hardware as shown below where necessary to preclude the use of thru-bolts.
 - 1. Exit Devices: 14-gauge
 - 2. Door Closers: 12-gauge
- C. All doors shall be beveled 1/8" in 2" and shall have top and bottom channels of not less than 16-gauge, flush or inverted, welded to the face sheets. Doors shall have a full height 14-gauge hinge rail reinforcement channel, or individual 10 gauge hinge reinforcements
- D. All doors to conform to ANSI-A250.4 Level "A" criteria and shall be tested to 1,000,000 operating cycles and 23 twist tests. Certification of Level "A" doors is to be submitted with approval drawings by supplier upon request. Do no bid or supply any type or gauge of door not having been tested and passed these criteria

2.04 METAL FRAMES

- A. Provide hollow metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on the drawings and schedules. Conceal fastenings unless otherwise indicated:
 - 1. Interior Frames: Level 2, 16-gauge
 - 2. Exterior Frames: Level 2, 16-gauge, galvanized or galvanealed
 - 3. Security Grade Frames: 14-gauge
- B. Acceptable Manufacturers/Products:
 - 1. Ceco: SU Series
 - 2. Curries: M Series
 - 3. Steelcraft: F Series
- C. All frames over 36" in width shall be 14-gauge.
- D. Fabricate frames with mitered corners. Weld both the inside the throat of the corners and the face of the corners, re-prime at the welded areas. All welds to be flush with neatly mitered or butted material cuts.
- E. All frames shall have minimum 7-gauge hinge reinforcements, 14-gauge lock strike reinforcing, and 12-gauge closer reinforcing.
- F. All frames shall have minimum 7-gauge hinge reinforcements with an additional high frequency 12-gauge hinge reinforcement welded to the top hinge, 14-gauge lock strike reinforcing, and 12-gauge closer reinforcing.
- G. Provide temporary shipping bars to be removed before setting frames.
- H. Except on weather stripped frames, drill stops to receive three (3) silencers on strike jambs of single frames and two (2) silencers on heads of double frames.
- I. Provide minimum 0.0179" thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings

2.05 DOOR LOUVERS

- A. Fire-Rated Louver:
 - 1. Each fire-rated louver shall have the listing mark of Underwriter's Laboratories Inc. affixed to louver assembly.

2. All louvers in fire-rated doors shall be 16-gauge cold rolled steel with stainless steel operating springs.
3. Louvers shall be sight-proof per SDI-111C.

B. Fixed-Blade Louver:

1. All fixed blade louvers shall be 18-gauge cold rolled steel with mitered and welded frames and countersunk mounting holes.
2. Louvers shall be sight-proof per SDI-111C.
3. Provide insect screen where louver occur in exterior doors.

2.06 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.

1. Clearances shall be no more than 1/8" at jambs and heads except between non fire rated pairs of doors which may be no more than 1/4."
2. Clearances shall be no more than 3/4" at the bottom of the doors.
3. Clearances shall be no more than 1/4" at thresholds and curbs allow unless otherwise detailed.

B. Fabricate exposed faces of doors and panels, including stiles and rails of non-flush units, from only cold-rolled steel sheet.

1. All doors shall be of types and sizes on the drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Doors shall be strong, rigid and neat in appearance, free from warpage or buckle. Corner bends shall be true and straight and of minimum radius for the gauge of metal used.
2. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door. All such welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
3. Top and bottom edges shall be closed with a continuous recessed 16 gauge steel channel extending the full width and spot welded to both faces. Exterior doors shall have an additional flush closing channel at the top edge. Opening shall be provided in the bottom closer for escape of entrapped moisture.
4. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully template hardware only. Where surface mounted hardware is to be applied, doors shall have reinforcing plates only, with drilling and tapping to be done in the field.
5. The Face sheets of Exterior and Security doors shall be stiffened by continuous vertical formed steel sections occupying the full thickness of the interior space between door faces. These stiffeners shall be not less than 20 gauge, spaced not more than 6" apart and securely attached to both face sheets by spot welds not more than 4" o.c. Spaces between stiffeners shall be sound deadened and insulated the full height of the door with an inorganic non-combustible batt-type material.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."

1. All door and louver frames shall be strong and rigid, neat in appearance, square, true and free of defects, warp and buckle. Molded members shall be clean cut, straight and of uniform profile and back-bends shall be as detailed.
 2. Corner joints shall have all contact edges closed tight, with trim faces and stops mitered and continuously welded. All welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
 3. Unit frames for installation in stud partitions shall be provided with steel anchors of suitable design for welding to steel studs. Anchors shall be not less than 16-gauge and shall be securely welded inside each jamb. Anchors are to be spaced at 24" on center.
 4. Dust cover boxes of not less than 26-gauge shall be provided at all hardware mortises on frames to be set in masonry or drywall partitions.
- D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.
- E. Unless otherwise indicated, provide exposed fasteners with countersunk flat or oval heads for exposed screws and bolts.
- F. Labeled doors and frames shall be provided for those openings requiring fire protection ratings, as scheduled on the drawings. Such doors and frames shall be constructed as tested by the Underwriter's Laboratories, Inc., and shall bear their label for the required rating. Provide additional frame accessories as required to maintain the fire protection ratings once the frames are installed in the openings.
- G. At exterior locations and elsewhere as shown or scheduled, assemblies fabricated as thermal-insulating door and frame assemblies and tested according to ASTM C 236 or ASTM C 976 on fully operable door assemblies. Unless otherwise indicated, provide thermal-rated assemblies with a minimum U-value rating of 0.41 Btu/sq. ft. x h x deg F.
- H. Where shown or scheduled, provide door and frame assemblies fabricated as sound-reducing type, tested according to ASTM E 1408, and classified according to ASTM E 413. Unless otherwise indicated, provide acoustical assemblies with STC sound ratings of 33 or better.
- I. Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI-107 and ANSI-A115 Series specifications for door and frame preparation for hardware.
- J. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site. Provide internal reinforcements for all doors to receive door closers and exit devices.
- K. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- L. Provide glazing stops with minimum 0.0359-inch- thick steel or 0.040-inch- thick aluminum.
- M. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
- N. Provide screw-applied, removable, glazing beads on inside of glass and other panels in doors.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.
- E. Beginning of installation means acceptance of conditions.

3.02 FIELD MEASUREMENTS

Verify all opening dimensions in the field prior to fabrication and assembly of frames.

3.03 INSTALLATION

- A. Install steel doors, frames, and accessories according to shop drawings, manufacturer's data, and as specified.
- B. Comply with provisions of SDI-105, "Recommended Erection Instructions for Steel Door Frames," unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
 - 1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
 - 2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
 - 3. At existing concrete or masonry construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.
 - 4. In metal-stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In steel-stud partitions, attach wall anchors to studs with screws.
 - 5. Install fire-rated frames according to NFPA 80.
- C. Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100. Install fire rated doors with clearances specified in NFPA 80.

3.04 ADJUST AND CLEAN

- A. Immediately after erection, sand smooth all rusted and damaged areas of prime coat, and apply touch-up of compatible air-drying primer.
- B. Immediately before final inspection, remove protective wrappings from doors and frames.
- C. Final adjustments:
 - 1. Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.
 - 2. Leave work in complete and proper operating condition.
 - 3. Remove defective work and replace with work complying with the specified requirements.

*** END OF SECTION ***

SECTION 08200

WOOD DOORS AND FRAMES

PART 1 -- GENERAL

1.01 GENERAL REQUIREMENTS

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 SUMMARY

Work under this section comprises of furnishing solid core doors (wood veneer faces and hardboard/MDF) light frames, factory fitting and machining and factory finishing for fire labeled and non labeled wood doors.

1.03 REFERENCES

A. Standards:

1. 2010 NFPA-80 – Fire Doors and Windows
2. 2010 NFPA-105 – Recommend Practice for Installation of Smoke Controlled Door Assemblies
3. WDMA I.S. 1A – Wood Door Manufacturer's Association, Flush Wood Door Performance Standards
4. UL10C - Standard for Positive Pressure Fire Tests of Door Assemblies

B. Codes:

1. 2009 NFPA-101 – Life Safety Code
2. 2010 CBC – California Building Code
3. ANSI-A117.1 – Accessible and Usable Buildings and Facilities.
4. 2010 DOJ – ADA Standards for Accessible Design

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications

1. Manufacturer shall be a member in good standing of the Wood Door Manufacturer's Association (WDMA).
2. Wherever possible obtain wood doors from a single manufacturer to ensure uniformity in quality of appearance and construction. All material supplied for this project to conform to WDMA I.S. 1A-97 for premium grade wood doors.

B. Fire-Rated Doors

1. Project requires door assemblies and components that are compliant with positive pressure and S-label requirements. Specifications must be cross-referenced and coordinated with hardware and other door manufacturers to ensure that total opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
 - a. Certification(s) of compliance shall be made available upon request by the Authority Having Jurisdiction.
 - b. For units exceeding sizes of tested assemblies provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.

2. A physical label to be permanently affixed to the fire door at an authorized facility. Furthermore, all 45, 60, and 90 minute label fire doors are to have manufacturer's standard laminated stiles for improved screw holding and split resistance capability.
3. At stairwell enclosures and where otherwise indicated, provide doors that have a maximum transmitted temperature end point of not more than 250 deg F above ambient after 30 minutes of standard fire-test exposure

1.05 SUBSTITUTIONS

Substitutions will be considered per General Condition Article 3.11.4 and Section 01630.

1.06 SUBMITTALS

A. Provide in accordance with Article 3.11 of the General Conditions.

B. Submit the following:

1. Provide a schedule of doors and frames using same reference numbers for details and door openings as those on the contract documents.
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Shop Drawings showing details of each frame type, elevations of door designs, details of openings, and details of construction, installation, and anchorage.
4. Samples:
 - a. Corner sections of doors approximately 8" x 10" with door faces and edgings representing the typical range of color and grain for each species of veneer and solid lumber required.
 - b. Factory finishes applied to actual door face materials, approximately 8" x 10" inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 - c. Frames for light openings, 6" long, for each material, type, and finish required.
 - d. Louver blade and frame sections, 6 inches long, for each material and finish specified.

1.07 PRODUCT HANDLING

A. Comply with the requirements of Section 01620.

B. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Doors are to be shipped from manufacturer in individual polybags, and shall be inspected immediately upon arrival at jobsite for any damage or defects.

C. Identify each door with individual opening numbers that correlate with designation system used on shop drawings and contract drawings for door, frames and hardware. Use only temporary, removable, or concealed markings.

D. Do not deliver or install doors until building is enclosed and weather tight, wet-work is complete and dry, and HVAC system is operating and maintaining ambient temperature and relative humidity at occupancy level in storage and installation areas.

1.08 CLOSE-OUT: Comply with the requirements of Section 01770 – Contract Closeout.

A. Reports:

None required.

B. As-Builts:

Comply with the requirements of Section 01770 – Contract Closeout.

C. Operation and Maintenance Data:

None required

D. Extra Materials:

None required

E. Extended Warranty:

Comply with the requirements of the General Condition Article 3.5 and Section 01740.

1. Warranties listed in this Section shall be in addition to, and not a limitation of other rights the owner may have under the contract documents.
2. Submit written warranty on manufacturer's standard form signed by the manufacturer agreeing to replace or repair defective doors which have:
3. Delamination in any degree.
4. Warp or twist of 1/4" or more in any 3' x 6" x 7' plane of door face.
5. Telegraphing of stile, rail or core through face to cause surface variation in excess of 1/100" in any 3" spans.
6. Contractor shall replace or refinish doors where contractor's work contributed to rejection or voiding of manufacturer's warranty.
7. Solid core interior doors shall be warranted for the life of their installation.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

Subject to compliance with requirements, provide wood doors by one of the manufacturers as listed.

2.02 FIRE RATED DOORS

All fire rated doors shall be supplied to meet UL10C positive pressure standards for category "A" doors. All required intumescent seals shall be concealed into the edge of the door; frame applied intumescent seals are not acceptable.

2.03 DOORS

A. See Door Schedule for Types

B. Plastic Laminated Wood Doors:

1. Manufacturers:
 - a. Ampco Products, Inc., (305) 821-5700, Opa Locka, Florida, 33054-5133
 - b. VT (800) 827-1615
 - c. Marshfield (800) 869-3667
 - d. Eggers (920) 722-6444
 - e. See 08210 - High Impact Resistant Wood Doors for alternate
2. Door Type: Flush Interior Doors: solid particleboard core construction.
3. Door Construction: Core: (rated and unrated) – AWI section 1300 Type PC – HPDL, FD 1/3, PC – HPDL – 3, or Ampco PC, PC20, or equal.
4. Flush Door Facing
 - a. High-pressure decorative laminate general purpose grade 50 (GP50 - .050" thick) complying with NEMA standard LD-3.

- b. Apply faces prior to edges, ease all corners.
 - c. Edges to match face.
 - 5. Adhesives
 - a. Face to Core / Frame: Type II
 - b. Piles of Face Material: Type II
 - 6. Fabrication
 - a. Fabricate in accordance with AWI Quality Standards.
 - b. Blocking for hardware reinforcement provided when necessary.
 - c. Factory machine for finish hardware.
- C. Faces for Transparent Finish
 - 1. Doors shall have premium grade A faces with manufacturer's standard five (5) ply construction; minimum 1/8" thick with stiles and rails bonded to the core.
 - 2. Faces shall be minimum 1/50" at 12% moisture content thick after finish sanding.
 - a. Veneer Cut: Plain Sliced
 - b. Face Assembly: Book Match, Running Match
 - c. Veneer Species: Per Drawings.
 - 3. Exposed vertical edges shall be of the same species as the face material.
 - 4. Doors shall have minimum 1" stiles on the hinge stile and 13/16" minimum on the lock stile; both stiles faces shall match the door veneer. Top and bottom rails shall be a minimum 13/16"; rails shall be mill option hardwood or structural composite lumber (SCL).
- D. Faces for Opaque Finish
 - 1. Faces shall be MDF; five (5) ply construction with stiles and rails bonded to the core.
 - a. Hardboard Faces: AHA A135.4, Class 1 (tempered) or Class 2 (standard).
 - b. MDF Faces: ANSI A208.2, Grade 150 or 160.
 - 2. Exposed vertical edges shall be any closed-grain hardwood.
 - 3. Doors shall have minimum 1" stiles on the hinge stile and 13/16" minimum on the lock stile; both stiles faces shall match the door veneer. Top and bottom rails shall be a minimum 13/16"; rails shall be mill option hardwood or structural composite lumber (SCL).
- E. Non Rated and 20-Minuted Fire-Rated Doors
 - 1. Supply particleboard core complying with WDMA I.S. 1A and ANSI-A208.1, Grade 1-LD, bonded to the door faces, stiles and rails using a Type I adhesive. Components are to be assembled to meet or exceed 20 minute fire door specifications for UL10C fire test requirements.
 - a. Algoma: Super Novodor / FD 1/3
 - b. Eggers: PC5 / PC5-20
 - c. Graham: GPD PC5 / GPD PC5-20
 - d. Marshfield: DPC-1 / DFP-20
 - e. VT Industries: 5502

2. Supply engineered core complying with WDMA I.S. 1A, bonded to door faces, stiles and rails using a Type I adhesive. Components are to be assembled to meet or exceed 20 minute fire door specifications for UL10c fire test requirements. Door shall meet or exceed WDMA I.S. 1A Extra Heavy Duty performance standards.
 - a. Algoma: FGFW
 - b. Eggers: SCL5 / SCL5-20
 - c. Graham: GPD EC5 / GPD EC5-20
 - d. Marshfield: DCL-1 / DCL-20
 - e. VT Industries: 5508
3. Provide LSL Timberstrand blocking at particleboard-core doors as follows to preclude the use of thru-bolts:
 - a. Provide 5" top-rail blocking, at doors indicated to have closers.
 - b. Provide 5" mid-rail blocking, at doors indicated to have exit devices.

F. Fire Rated Doors over 20 Minutes

1. Supply fire resistive composite mineral core construction to provide the fire rating indicated, bonded to door faces, stiles and rails using a Type I adhesive. Components are to be assembled to meet or exceed fire door specifications for UL10C fire test requirements.
 - a. Algoma: FD
 - b. Eggers: FGP
 - c. Graham: GPD FD5
 - d. Marshfield: DFM
 - e. VT Industries: 5545/5511
2. For mineral-core doors, provide composite blocking with improved screw holding capability approved for use in doors of fire ratings indicated as necessary to eliminate need for through-bolting hardware and as follows:
 - a. Provide 5" top-rail blocking.
 - b. Provide 4 1/2" x 10" lock blocks.
 - c. Provide 5" mid-rail blocking, at doors indicated to have exit devices.
3. At hinge stiles, provide manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance and with outer stile matching face veneer.

G. Factory Finishing

1. Finish all doors to receive a transparent finish at the factory as indicated below; field finish doors indicated to receive an opaque finish in accordance with Division 9, Finishes.
 - a. Grade: Premium
 - b. Finish: WDMA TR-6 catalyzed polyurethane.
 - c. Stain: Clear-coat only.
 - d. Effect: Semi-filled finish, produced by applying an additional finish coat to partially fill the wood pores.
2. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.

3. Finish doors using three (3) coats of water-clear 100% solids, modified acrylic urethane, cured immediately with ultra-violet light.
4. Factory seal transparent finish doors on all six (6) sides using manufacturer's standard meeting these applications.

H. Vision Light Frames:

1. Provide wood beads for light openings in doors up to and including 20-minute rating; at 20-minute rated doors provide wood beads and metal glazing clips approved for such use.
 - a. Wood Species: Same species as door faces.
 - b. Profile: Flush rectangular beads. [Lipped tapered beads.]
2. For fire-rated doors over 20-minute rated provide manufacturer's standard metal light frame formed of 0.048 inch thick cold-rolled steel sheet with baked-enamel or powder-coated finish approved for use in doors of fire rating indicated.

I. Louvers:

1. Provide manufacturer's standard solid wood louvers unless otherwise indicated; species shall be the same as door faces.
2. Provide metal louvers with vision-proof inverted V or inverted Y blades constructed of galvanized 0.040 inch thick steel factory primed for paint finish with baked-enamel or power-coated finish.
3. Provide metal louvers for fire-rated doors with fusible link and closing device listed and labeled for use in doors with fire-protection rating of-1 1/2 hours or less. Subject to compliance with rating requirements, louver construction and material shall be the same as non-rated versions.

J. Fabrication

1. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated: Comply with clearance requirements of referenced quality standard for fitting. Comply with requirements of NFPA 80 for fire-rated doors.
2. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 - a. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - b. Pre-machine metal astragals and formed-steel edges for hardware for pairs of fire-rated doors.
3. Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required. Trim openings with moldings of material and profile indicated.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed.
- B. Verify that specified items may be installed in accordance with the approved design.
- C. Correct conditions detrimental to timely and proper completion of the Work.
- D. Do not proceed until unsatisfactory conditions are corrected.

E. Beginning of installation means acceptance of conditions.

3.02 INSTALLATION

- A. For hardware installation, see Division 8 Section "Door Hardware."
- B. Install wood doors to comply with manufacturer's written instructions, referenced quality standard and as indicated.
- C. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.
- D. Align factory fitted doors in frames for uniform clearance at each edge.

3.03 ADJUSTING, PROTECTING AND CLEANING

- A. Verify that each item has been fabricated and installed in accordance with the specified requirements
- B. Adjust, re-hang or replace doors that do not swing or operate freely.
- C. Refinish or replace doors damaged during installation as necessary to make surface blemishes permanently invisible to the unaided eye.
- D. Protect doors as recommended by door manufacturer to ensure that wood doors are without damage or deterioration at the time of Substantial Completion.

***** END OF SECTION *****

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SECTION 08310

ACCESS DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Fire rated and Non-fire rated wall access doors.
2. Fire rated and Non-fire rated ceiling access panels.
3. Related hardware and attachments.

B. Related Requirements:

1. Section 09250 - Gypsum Board Systems
2. Section 09510 - Acoustical Ceiling System
3. Section 09900 - Painting
4. Division 15 - Mechanical.
5. Division 16 – Electrical.

1.2 COORDINATION

A. Provide inserts and anchoring devices that will be built into other Work for installation of access door assemblies.

B. Coordinate delivery with other Work to avoid delay.

1.3 SUBMITTALS

A. Comply with Division 01.

B. Shop Drawings:

1. Door and panel units: Show types, elevations, thickness of metals, full size profiles of door members.
2. Hardware: Show materials, finishes, locations of fasteners, types of fasteners, locations and types of operating hardware, and details of installation.
3. General: Show connections of units and hardware to other Work. Include schedules showing location of each type and size of door and panel units.

C. Product Data: Manufacturer's technical data for each type of access door and panel assembly, including setting drawings, templates, fire-resistive characteristics, finish requirements, and details of anchorage devices.

1. Include complete schedule, types, locations, construction details, finishes, latching or locking provisions, and other pertinent data.

D. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.

1.4 QUALITY ASSURANCE

A. Fire-Resistance Ratings: Wherever a fire-resistance classification is indicated, provide access door and panel assemblies with panel door, frame, hinge, and latch from manufacturer listed in Underwriter's Laboratories (UL), "Building Materials Directory" for rating shown.

1. Provide 90 minute UL label at 2-hour rated partitions.

2. Provide 3 hour Warnock Hersey label at horizontal applications, up to 24 inch wide x 36 inch high.
3. Provide 2 hour Warnock Hersey label at horizontal applications greater than 24 inch wide x 36 inch high.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Package and ship per manufacturer's recommendations.
- B. Store per manufacturer's instructions.
 1. Store in dry area out of direct sunlight.

1.6 WARRANTY

- A. Provide manufacturer's written warranty.
- B. Warrant materials and fabrication against defects after completion and final acceptance of Work.
 1. Repair defects, or replace with new materials, faulty materials or fabrication developed during the warranty period at no expense to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Nystrom Building Products. 9300 73rd Avenue North, Minneapolis, MN 55428. Toll Free: 800-547-2635 Fax: 800-317-8770. E-Mail: info@nystrom.com
nystrom.com

2.2 DESIGN REQUIREMENTS:

- A. Obtain specific locations and sizes for required access doors and frames from trades, including mechanical and electrical, requiring access to concealed equipment and indicate on submittal schedule.

2.3 MATERIALS

- A. Commercial quality, cold steel sheet with gray baked on powder coat finish.
- B. Galvanized, bonderized steel with gray baked on powder coat finish.
- C. Type: No. 304 stainless steel with No. 4 satin polish finish.

2.4 ACCESS PANELS

- A. Non rated flush access doors, Nystrom Architectural N series
 1. Door: Fabricate from 14-gage cold rolled sheet steel.
 2. Frame: Fabricate from 16-gage cold rolled sheet steel. Provide 1/4 inch mounting holes and easy install tabs.
 - a. NT - All surfaces - 1 inch flange at perimeter.
 - b. NW - Wallboard surfaces – 22-gage galvanized drywall bead at perimeter.
 - c. NP - Plaster surfaces – 22-gage galvanized plaster bead at perimeter.
 - d. PT – Stainless Steel – 1 inch Flange at perimeter.
 3. Hinge:
 - a. NT – Concealed spring button type to allow for door removal.
 - b. NW and NP – Concealed spring button type to allow for door removal.

- c. PT – Pin hinge
- 4. Latching/Locking Devices: Screwdriver cam latch - standard.
OPTIONS:
 - a. Key operated cylinder cam lock with 2 keys per lock, keyed alike.
 - b. Preparation to accept a 1 1/8" mortise cylinder. Cylinder and core specified in Division 8 Section "Door Hardware"
- 5. Finish Options:
 - a. Standard: Gray baked on powder coat finish.
 - b. Galvanized, bonderized steel, with gray baked on powder coat finish.
 - c. Type No. 304 stainless steel with No. 4 satin polish.
- B. Non-rated flush access doors, Nystrom Renovation E series
 - 1. Door: Fabricate from 20-gage cold rolled sheet steel.
 - 2. Frame: Fabricate from 20-gage cold rolled sheet steel. Provide 1/4 inch mounting holes and easy install tabs.
 - a. ET - All surfaces - 1 inch flange at perimeter.
 - b. EW - Wallboard surfaces – 22-gage galvanized drywall bead at perimeter.
 - 3. Hinge:
 - a. ET – Concealed spring button type to allow for door removal.
 - b. EW– Concealed spring button type to allow for door removal.
 - 4. Latching/Locking Devices: Screwdriver cam latch - standard.
OPTION:
 - a. Key operated cylinder cam lock with 2 keys per lock, keyed alike.
 - 5. Finish Options:
 - a. Standard: Gray baked on powder coat finish.
 - b. Galvanized, bonderized steel, with gray baked on powder coat finish.
 - c. Type No. 304 stainless steel with No. 4 satin polish.
- C. Non-rated access panels for walls only, Nystrom D series
 - 1. Maximum size = 36"w x 48"h (W & P only).
 - 2. Door: Fabricate from 14-gage cold rolled sheet steel.
 - 3. Frame: Fabricate from 16-gage cold rolled sheet steel of configuration to suit material application.
 - a. DT- All surfaces - 1 inch flange at perimeter.
 - b. DW - Wallboard surfaces – 22-gage galvanized drywall bead at perimeter.
 - c. DP- Plaster surfaces – 22-gage galvanized plaster bead at perimeter.
- D. Insulated fire rated access panels for walls and ceilings, Nystrom I series
 - 1. Maximum size horizontal applications = 24 inch x 36 inch.
 - 2. Maximum size vertical applications: IT= 48 inch x 48 inch, IW, and IP= 36 inch x 48 inch.

3. Door: Fabricate from 20-gage cold rolled sheet steel, insulated sandwich type construction.
 4. Frame: Fabricate from 16-gage cold rolled steel of configuration to suit material application.
 - a. IT - All surfaces - 1 inch flange at perimeter.
 - b. IW - Wallboard surfaces - 22-gage galvanized drywall bead at perimeter.
 - c. IP - Plaster surfaces - 22-gage galvanized plaster bead at perimeter.
 5. Hinge: Flush continuous piano type on model IT. Concealed pin hinge on style IW and IP.
 6. Latching/Locking mechanism: Knurled knob/flush key operated latch bolt - standard.
OPTION:
 - a. Preparation to accept a 1 1/8" mortise cylinder. Cylinder and core specified in Division 8 Section "Door Hardware"
 7. Finish Options:
 - a. Standard: Gray baked on powder coat finish.
 - b. Galvanized, bonderized steel, with gray baked on powder coat finish.
 - c. Type No. 304 stainless steel with No. 4 satin polish.
 8. Insulation: 2 inch thick fire rated mineral fiber.
 9. Automatic closure device: Integral automatic spring closure device for each door.
 10. Interior latch release: Mechanism to allow for panel to open from interior side.
- E. Uninsulated fire rated access panels for walls only, Nystrom U series
1. Maximum size = 36"w x 48"h.
 2. Door: Fabricate from 14-gage cold rolled sheet steel.
 3. Frame: Fabricate from 16-gage cold rolled sheet steel of configuration to suit material application.
 - a. UT- All surfaces - 1 inch flange at perimeter.
 - b. UW - Wallboard surfaces – 22-gage galvanized drywall bead at perimeter.
 - c. UP- Plaster surfaces – 22-gage galvanized plaster bead at perimeter.
 4. Finish Options:
 - a. Standard: Gray baked on powder coat finish.
 - b. Galvanized, bonderized steel, with gray baked on powder coat finish.
 - c. Type No. 304 stainless steel with No. 4 satin polish.
 5. Hinge: Flush continuous piano type.
 6. Latching/Locking mechanism: Knurled knob/flush key operated latch bolt - standard.
OPTIONS:
 - a. Preparation to accept a 1 1/8 inch mortise cylinder. Cylinder and core specified in Division 8 Section "Door Hardware"
 - b. Other options as specified.
 7. Automatic closure device: Integral automatic spring closure device for each door.

8. Interior release: Mechanism to allow for panel to open from interior side.

F. Oversized Fire Rated Access Panels for horizontal and vertical applications, Nystrom FRD Series

1. Sizes: 30 inch x 30 inch up to 48 inch x 60 inch for horizontal applications. Call factory for single or double door construction options.
2. Sizes: Greater than 48 inch x 48 inch up to 48 inch x 60 inch vertical applications, all panels to be double door construction.
3. Door: Fabricate from 18-gage galvanized steel, insulated sandwich type construction. 22 gage liner.
4. Frame: Fabricate from 16-gage galvanized steel.
 - a. .875 flange at perimeter.
5. Hinge: Concealed continuous rod opening to 100 degrees.
6. Latching/Locking Mechanism: Factory installed flush ¼ inch allen key, self-latching.
7. Finish Options:
 - a. White electrostatically applied rust inhibitive prime coat.
 - b. Options: Type No. 304 stainless steel with No. 4 satin polish.
8. Insulation: 1 ½ inches thick high temperature.
9. Automatic Closure Device: Integral automatic spring closure device for each door, will close and latch all doors from an open position of approximately 90 degrees.
10. Interior Latch Release: Mechanism to allow for panel to open from interior side-standard on all panels.

G. Inward Opening Fire Rated Access Panels for horizontal applications only, Nystrom FRU series

1. Maximum sizes: 24 inch x 36 inch or 30 inch x 30 inch.
2. Door: Fabricate from 18-gage galvanized steel, insulated sandwich type construction.
3. 22-gage liner.
4. Frame: Fabricate from 16-gage galvanized steel.
 - a. .75 inch flange at perimeter
5. Hinge: Concealed continuous piano hinge
6. Latching/Locking Mechanism: Factory installed ¼ inch allen key, self-latching.
7. Finish Options:
 - a. White electrostatically applied rust inhibitive prime coat.
 - b. Options: Type No. 304 stainless steel with No. 4 satin finish.
8. Insulation: 1 ½ inches thick high temperature.
9. Automatic Closure: Gravity self closing.
10. Interior Latch Release: Mechanism to allow for panel to open from interior side-standard on all panels.

H. Recessed access panels, Nystrom R series

1. Door: Fabricate from 16-gage cold rolled sheet steel recessed 5/8 inch for in-fill of material.

2. Frame: Fabricate from 16-gage cold rolled sheet steel of configuration to suit material application.
 - a. RW- Wallboard surfaces – 22-gage galvanized drywall bead at perimeter.
 - b. RP- Plaster surfaces – 22-gage galvanized plaster bead at perimeter.
 - c. RA - Acoustical surfaces - no surface frame.
 3. Hinge: Concealed pivoting rod.
 4. Latching: Key operated cylinder cam lock with 2 keys per lock, keyed alike.

OPTION:

 - a. Preparation to accept a 1 1/8 inch mortise cylinder. Cylinder and Core specified in Division 8 Section "Door Hardware".
 5. Finish: Gray baked on powder coat finish.
- I. Security, insulated fire rated access panels, Nystrom S series – walls only
1. Door: Fabricate from 14-gage cold rolled sheet steel, insulated sandwich type construction.
 2. Frame: Fabricate from 16-gage cold rolled sheet steel of configuration to suit material application.
 - a. ST- All surfaces - 1 inch flange at perimeter.
 - b. SW- Wallboard surfaces – 22-gage galvanized drywall bead at perimeter.
 - c. SP- Plaster surfaces – 22-gage galvanized plaster bead at perimeter.
 3. Hinge: Concealed pin type for concealed frame. Flush continuous piano type for exposed frame and on panels larger than 36 inches in height.
 4. Latching:
 - a. Preparation to accept a 1 1/8 inch mortise cylinder. Cylinder and Core specified in Division 8 Section "Door Hardware".
 - b. Detention dead-bolt lock preparation. Lock specified in Division 8 Section "Door Hardware".
 5. Finish Options:
 - a. Standard: Gray baked on powder coat finish.
 - b. Galvanized, bonderized steel with gray baked on powder coat finish.
 - c. Type No. 304 stainless steel with No. 4 satin finish.
 6. Automatic closure device: Integral automatic spring closure device for each door.
 7. Interior latch release: Mechanism to allow for panel to open from interior side.
- J. Medium security access doors, Nystrom M series
1. Door: Fabricate from 12-gage cold rolled sheet steel.
 2. Frame: Fabricate from 12-gage cold rolled sheet steel of configuration to suit material application.
 - a. MT- All surfaces - 1 inch flange at perimeter.
 - b. MW- Wallboard surfaces – 22-gage galvanized drywall bead at perimeter.
 - c. MP- Plaster surfaces – 22-gage galvanized plaster bead at perimeter.
 3. Hinge: Concealed continuous piano type.

4. Latching/Locking Mechanism: Pinned allen head security cam latches - standard.
 OPTIONS:
 - a. Pinned allen head security screws.
 - b. Preparation to accept a 1 1/8 inch mortise cylinder. Cylinder and core specified in Division 8 Section "Door Hardware"
 - c. Heavy-duty detention deadbolt lock preparation. Lock specified in Division 8 Section "Door Hardware".
 5. Finish Options:
 - a. Standard: Gray baked on powder coat finish.
 - b. Galvanized, bonderized steel with gray baked on powder coat finish.
 - c. Type 304 stainless steel with #4 satin finish.
- K. High security access panels, Nystrom HS series
1. Door: Fabricate from 10-gage cold rolled steel.
 2. Frame: Fabricate from 2 inch by 2 inch by 3/16 inch steel angle.
 3. Hinge: Heavy-duty steel butt hinge welded to the door and frame (surface mounted).
 OPTIONS:
 - a. Continuous piano type.
 4. Frame: Masonry anchors welded to frame.
 5. Latching/Locking Mechanism: Pinned allen security screws – standard.
 OPTIONS:
 - a. Preparation to accept a 1 1/8" mortise cylinder. Cylinder and core specified in Division 8 Section "Door Hardware"
 - b. Heavy-duty detention deadbolt lock preparation. Lock specified in Division 8 Section "Door Hardware".
 6. Finish: Gray baked on powder coat finish.
- L. Maximum security access panels, Nystrom TS series
1. Door: Fabricate from 7-gage hot rolled steel.
 2. Frame: Fabricate from 2 inch by 3 inch by 3/16 inch steel angle.
 3. Hinge: Heavy-duty steel butt hinge welded to the door and frame (surface mounted).
 OPTIONS:
 - a. Continuous piano type.
 4. Frame: Masonry anchors welded to frame.
 5. Latching/Locking Mechanism: Heavy-duty detention lock preparation - standard. Lock specified in Division 8 Section "Door Hardware".
 OPTIONS:
 - a. Other options as specified.
 6. Finish: Gray baked on powder coat finish.
- M. Exterior insulated access panel, Nystrom XT series
1. Door: Fabricate from 20-gage galvanized steel, insulated sandwich type construction.

2. Hinge: Stainless steel continuous piano type.
OPTIONS:
 - a. Type No. 304 stainless steel – door only.
3. Frame: Fabricate from 6063-T5 extruded aluminum.
4. Latching/Locking device: 1 or 2 dual acting handles, depending on door size.
OPTIONS:
 - a. Lockable handle for exterior only.
5. Flange: 0.080 6063-T5 extruded aluminum 1.25 inch flange.
6. Finish: Paint grip.
7. Insulation: 2 inch thick fiberglass.
8. Gasket: Extruded santoprene.

N. Special lightweight access panel, Nystrom LW series

1. Door: Fabricate from 26-gage pre-finished embossed galvanized steel.
OPTIONS:
 - a. 0.063 aluminum door panel
2. Frame: 0.045 6063-T5 extruded aluminum with rolled 1-5/16 inch flange
3. Hinge: Zinc plated continuous piano type.
OPTIONS:
 - a. Aluminum continuous piano type.
4. Latching/Locking device: Screwdriver cam latch – standard.
OPTIONS:
 - a. Key operated cylinder lock with 2 keys per lock, keyed alike.
5. Insulation: 3/4 inch polystyrene with 3.8 R-value at 75 degrees F temperature.
6. Finish: White embossed steel.
OPTIONS:
 - a. Mill finish with 0.063 aluminum panel inserts.

2.5 OPTIONS

THE FOLLOWING MORTISE OPTION MAY BE USED ON N SERIES, I SERIES, U SERIES, S SERIES (WALL ONLY), M SERIES, AND HS SERIES.

- A. Mortise cylinder preparation to receive 1 1/8 inch mortise cylinder lock. Lock specified in Division 8 Section "Door Hardware".

2.6 FABRICATION

- A. Manufacture each access panel assembly as an integral unit ready for installation.
- B. Welded construction: Furnish with a sufficient quantity of 1/4 inch mounting holes to secure access panels to types of supports indicated.
- C. Recessed panel: Form face of panel to provide specified recess for application of finish material. Reinforce panel as required to prevent buckling.
- D. Furnish number of latches required to hold door in flush, smooth plane when closed.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings for door and frame are correctly sized and located.
- B. Verify mechanical and electrical requirements for ceiling or wall access panels.

3.2 INSTALLATION

- A. Install access door and frame units per manufacturer's written instructions.
- B. Install frames plumb and level in opening. Secure rigidly in place.
- C. Position units to provide convenient access to concealed Work requiring access.
- D. Fire-rated units: Include UL or Warnock-Hersey labels.

3.3 ADJUSTING AND CLEANING

- A. Adjust panel after installation for proper operation.
- B. Remove and replace panels or frames that are warped, bowed, or damaged.

*****END OF SECTION*****

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SECTION 08500

ALUMINUM WINDOWS

PART 1 -- GENERAL

1.01 **GENERAL REQUIREMENTS**

Division 0, Contract Requirements and Division 1, General Requirements apply to this Section.

1.02 **SUMMARY**

This section includes the following:

1. AA®900 ISOWEB® Fixed Window
2. Heavy Commercial Grade (HC rating)/Architectural Grade (AW rating)
3. Architectural details, product descriptions and product performance specifications are based on products manufactured by the Kawneer Company Inc.

1.03 **REFERENCES**

A. Aluminum Association (AA):

DAF-45 Designation System for Aluminum Finishes

B. American Architectural Manufacturers Association (AAMA):

1. 2605 Voluntary Specification for High Performance Organic Coatings on Architectural Extrusions and Panels.
2. 611 Voluntary Specification for Anodized Architectural Aluminum.

C. American National Standards Institute (ANSI):

Z97.1 Specifications and Methods of Test for Safety Glazing Material Used in Buildings.

D. American Society for Testing and Materials (ASTM):

1. A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. A525 General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
3. A526 Sheet Steel, Zinc Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
4. B209 Aluminum and Aluminum-Alloy Sheet and Plate.
5. B221 Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.
6. B308 Aluminum-Alloy 6061-T6 Standard Structural Shapes, Rolled or Extruded.
7. C716 Installing Lock-Strip Gaskets and Infill Glazing Materials.
8. C920 Elastomeric Joint Sealants.
9. E283 Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors.
10. E330 Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
11. E331 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

- 12. E773 Test Method for Seal Durability of Sealed Insulating Glass Units.
- 13. E774 Sealed Insulating Glass Units.
- E. Consumer Product Safety Commission (CPSC)
 - 16 CFR 1201 Safety Standard for Architectural Glazing Materials
- F. Federal Specifications (FS):
 - TT-P-645A Primer, Paint, Zinc Chromate, Alkyd Type.
- G. Glass Association of North America (GANA):
 - Glazing Manual

1.04 SYSTEM DESCRIPTION

- A. General: Commercial Grade Architectural Aluminum Windows, including glass and glazing, metal panels, perimeter trims, sills and stools, window installation hardware and accessories, shims and anchors, and perimeter sealing of window units.
- B. Aluminum Windows include: Kawneer Company, Inc., AA[®]900 ISOWEB[®] Window in accordance with AAMA /WDMA/CSA 101/I.S.2/A440-05 Standard/Specification for Windows, Doors, and Unit Skylights for a Class and Grade of FW-HC90/FW-AW90 and in accordance with CAN/CSA-A440-00 Windows.
- C. Test Units:
 - 1. All test unit sizes and configurations shall conform to the minimum size in accordance with AAMA /WDMA/CSA 101/I.S.2/A440-05 for the designation FW-HC90/FW-AW90 and CAN/CSA-A440-00 Windows.
 - 2. Units submitted for laboratory testing shall be units of the manufacturer's standard construction, glazed and assembled in accordance with the manufacturer's specifications and AAMA /WDMA/CSA 101/I.S.2/A440-05 and CAN/CSA-A440-00 Windows.
- D. Fixed Window Performance Requirements:
 - 1. Wind loads: Provide window system; include anchorage, capable of withstanding wind load design pressures of based on 85 mph, exposure C, Occupancy Category IV of an enclosed structure. The design pressures are based on the (California) Building Code; (2010) Edition.
 - 2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E283 at a minimum size of 60" x 90" (1524 x 2286). Air infiltration rate shall not exceed 0.10 cfm/ft² at a static air pressure differential of 6.24 psf (300 Pa). The test specimen shall meet the Fixed rating of less than 0.25 (m³/h)/m at 300Pa when tested in accordance with CAN/CSA-A440-00 Windows.
 - 3. Water Resistance: The test specimen shall be tested in accordance with ASTM E547 and ASTM E331 at a minimum size of 60" x 90" (1524 x 2286). There shall be no leakage as defined in the test method at a static air pressure differential of 15 psf (720 Pa). The test specimen shall meet the B7 rating with no water leakage at 720 Pa when tested in accordance with CAN/CSA-A440-00 Windows.
 - 4. Uniform Load Deflection: A minimum static air pressure difference of 90 psf (4310 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330. There shall be no deflection in excess of L/175 of the span of any framing member. The test specimen shall meet the C5 rating when tested in accordance with CAN/CSA-A440-00 Windows.

5. Uniform Load Structural: A minimum static air pressure difference of 135 psf (6465 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330. The unit shall be evaluated after each load.
6. Component Testing: Window components shall be tested in accordance with procedures described in AAMA/WDMA/CSA 101/I.S.2/A440-05.
7. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than 0.34 BTU/hr/ft²/°F.
8. Condensation Resistance (CRF): When tested to AAMA Specification 1503 and CAN/CSA-A440, the condensation resistance factor (CFR) shall not be less than 67 (66 I-Frame).
9. Forced Entry Resistance: All windows shall conform to AAMA 1302.5.
10. Thermal Barrier Test: Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.

1.05 QUALITY ASSURANCE

A. Qualifications:

1. Installer Qualifications: Installer experienced (as determined by contractor) to perform work of this section who has specialized in the installation of work similar to that required for this project and who is acceptable to product manufacturer.
2. Manufacturer Qualifications: Manufacturer capable of providing structural calculations, applicable independent product test reports, installation instructions, a review of the application method, customer approval and periodic field service representation during construction.

- B. Pre-Installation Meetings: Conduct pre-installation meeting to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements.

1.06 SUBSTITUTIONS

- A. Substitutions will be considered per General Conditions Article 3.11.4 and Section 01630.

B. Substitution Documentation. Provide for evaluation:

1. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
2. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for window system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum windows for a period of not less than ten (10) years. (Company Name)
3. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
4. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

1.07 SUBMITTALS

- A. Provide in accordance with Article 3.11 of the General Conditions.

B. Submit the following:

1. Product Data.
2. Samples

3. Shop drawings showing installation details for Architect's approval. These drawings shall also show elevations of windows, full-sized details of all sections of windows, collateral materials, details of anchorage and hardware.
4. Supplemental data shall contain instructions for storage, handling and erection of windows

C. Quality Assurance/Control Submittals:

Test Reports: Submit certified test reports showing compliance with specified performance characteristics.

1.08 PRODUCT HANDLING

- A. Adhere to requirements of Section 01620.
- B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- C. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle window material and components to avoid damage. Protect window material against damage from elements, construction activities, and other hazards before, during and after window installation.

1.09 CLOSE-OUT: Comply with the requirements of Section 01770 – Contract Closeout.

- A. Reports: None required.
- B. As-Builts: Comply with the requirements of Section 01770 – Contract Closeout.
- C. Operation and Maintenance Data: None required
- D. Extra Materials: None required
- E. Extended Warranty: Comply with the requirements of the General Condition Article 3.5 and Section 01740.
 1. Project Warranty: Refer to "Conditions of the Contract" for project warranty provisions.
 2. Manufacturer's Product Warranty: Submit, for Owner's acceptance, manufacturer's warranty for window system as follows: Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by Kawneer.

PART 2 -- PRODUCTS

2.01 MANUFACTURERS

- A. Kawneer Company, Inc.
- B. Vistawall (Oldcastle)
- C. Arcadia
- D. Architect approved equal.

2.02 WINDOW SYSTEM

- A. Kawneer Aluminum Window System
- B. Series: AA[®]900 ISOWEB[®] Thermal Window System
- C. Window Member Profile: 2-5/8" (67) nominal dimension.

D. Finish/Color: (See 2.09 Finishes)

2.03 MATERIALS

- A. Aluminum (Windows and Components): Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of Extruded Material Standard: ASTM B 221, 6063-T6 alloy and temper.
- B. Steel Reinforcement: Complying with ASTM A 36/ A 36M for structural shapes, plates and bars; ASTM A 611 for cold-rolled sheet and strip or ASTM A 570/ A 570M for hot-rolled sheet and strip.
- C. Glazing Gaskets: Dry glazing gaskets shall be an extruded EPDM in accordance with ASTM C864.
- D. Glazing Sealant: Wet glazing material shall be a 100 percent silicone, neutral-cure sealant in accordance with AAMA 805.2-94, Group A.
- E. Fasteners: Where exposed, shall be 300 Series Stainless Steel.
- F. Thermal Barrier: The thermal barrier shall be Kawneer ISOWEB® consisting of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.

2.04 ACCESSORIES

- A. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.
- B. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
- C. Sealants and joint fillers for joints at perimeter of window system as specified in Division 7 Section "Joint Sealants".
- D. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- E. Glazing: Factory glazing as required and specified in Division 8 Section "Glazing".
- F. Coupling Mullions: Shall be extruded aluminum of 6063-T6 alloy and temper of profile and dimensions indicated on drawings. Mullions shall provide structural properties to resist wind pressure required by performance criteria and standards.

2.05 RELATED MATERIALS

- A. Sealants: Refer to Division 7 Section "Joint Sealants"
- B. Glass: Glass thickness and type shall be in accordance with glass manufacturer's recommendations for prescribed design pressure. Refer to Division 8 Section "Glass and Glazing".
 - 1. Factory glazing (if required) shall be in accordance with manufacturer's standard requirements.
 - 2. Glazing materials shall be compatible with aluminum and those sealants and sealing materials used in composite structure which have direct contact with the gasket.
- C. Insulation: Refer to Division 7 Section "Building Insulation".
- D. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.06 COMPONENTS

- A. The frame depth shall be not less than 2-5/8".
- B. All frame members shall have minimum wall thickness of 0.070" and shall provide the structural strength sufficient to meet the specified performance requirements.
- C. Glazing beads shall be extruded aluminum and shall be a minimum thickness of 0.060".
- D. Reference to tolerances for wall thickness and other cross-sectional dimensions of window members are nominal and in compliance with AA Aluminum Standards and Data.
- E. All references to dimensions for wall thicknesses and other cross-sectional dimensions of window members are nominal and in compliance with ANSI H35.2-1990.
- F. All frame members shall be tubular.

2.07 FABRICATION

- A. General: Fabricate components per manufacturer's installation instructions. When assembled, components shall be accurately fitted to produce hairline joints.
- B. Window Frame Joinery: Mitered and mechanically clipped and/or staked.
- C. Factory sealed frame and corner joints.

2.08 FINISHES

Factory Finishing -

Fluropon® (70% PVDF), AAMA 2605, Fluoropolymer Coating

Interpon® D2000, AAMA 2604, Powder Coating

Other:

2.09 FINISH

- A. Cover all exposed areas of aluminum windows and components. Exterior finish shall be 70% Polyvinylidene Fluoride.
- B. Type: high performance baked-on organic coating.
- C. AAMA Specification: Comply with AAMA 2605.
- D. Aluminum Association Designation: AA.M10.C22.A4X.
- E. Color: Match existing City Hall

2.10 SOURCE QUALITY CONTROL

- A. Single Source Quality: Provide aluminum windows specified herein from a single source.
- B. Building Enclosure System: When aluminum windows are part of a building enclosure system, including entrances, entrance hardware, curtain walls, storefront systems, sliding glass doors, slope glazing, and related products, provide building enclosure system products from a single source manufacturer.

PART 3 -- EXECUTION

3.01 EXAMINATION

- A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.
- B. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with

manufacturer's instructions. Verify openings are sized to receive window system and sill plate is level in accordance with manufacturer's acceptable tolerances.

- C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.02 INSTALLATION

- A. General: Install window system in accordance with manufacturer's instructions and AAMA window guide specifications manual.
 - 1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
 - 2. Weathertight Construction: Install sill members and other members in a bed of sealant or with joint filler or gaskets, to provide weathertight construction. Coordinate installation with wall flashings and other components of construction.
 - 3. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
 - 4. Provide alignment attachments and shims to permanently fasten system to building structure.
 - 5. Align assembly plumb and level, free of warp and twist. Maintain assembly dimensional tolerances aligning with adjacent work.
- B. Related Products Installation Requirements:
 - 1. Sealants (Perimeter): Refer to Joint Treatment (Sealants) Section.
 - 2. Glass: Refer to Glass and Glazing Section.
 - 3. Reference: ANSI Z97.1, CPSC 16 CFR 1201 and GANA Glazing Manual.

3.03 FIELD QUALITY CONTROL

Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.04 PROTECTION AND CLEANING

- A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum window system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.
- B. Cleaning: Repair or replace damaged installed products.
- C. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.
- D. Remove construction debris from project site and legally dispose of debris.

***** END OF SECTION *****

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