

#### MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI #79.  
B. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 23 and compatible with topcoat.  
1. Products:  
a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.  
b. Carboline Company; Carbozinc 621.  
c. ICI Devoe Coatings; Catha-Coat 313.  
d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.  
e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.  
f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.  
g. Themec Company, Inc.; Themec-Zinc 90-97.  
h. Galvanizing Repair Paint: SSPC-Paint 20, high-zinc-dust-content paint for regalanizing welds in package.  
i. Nonshrink, Nidertone Concrete Crack Filler, nonshrink, noncorrosive, nongaseous grout complying with ASTM C 1107.  
E. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), unless otherwise indicated.

#### FABRICATION

A. General: Preamseable items in the shop to greatest extent possible. Use connections that maintain structural value of joined pieces.  
1. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges. Remove sharp or rough areas on exposed surfaces.  
2. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended.  
3. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous.  
4. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.  
5. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, not less than 24 inches (600 mm) o.c.

B. Miscellaneous Framing and Supports: Provide steel framing and supports not specified in other Sections as needed to complete the Work. Fabricate units from steel shapes, plates, and bars of welded construction. Cut, drill, and tap units to receive hardware, hangers, and similar items.  
C. Loose Steel Lintels: Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.  
1. Lintels in Exterior Walls: Prime with zinc-rich primer.  
2. Shelf Angles: Fabricate shelf angles of sizes indicated and for attachment to framing. Fabricate with horizontally slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6 inches (150 mm) from ends and 24 inches (600 mm) o.c.  
1. Shelf Angles in Exterior Walls: Prime with zinc-rich primer.  
2. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.  
E. Loose Bearing and Leveling Plates: Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts.  
F. Metal Ladders: Comply with ANSI A14.3, unless otherwise indicated.  
1. Elevator Pit Ladders: Comply with ASME A17.1.  
2. Space siderails: 18 inches (457 mm) apart, unless otherwise indicated.  
3. Steel Ladder Construction: Flat bar siderails, with 3/4-inch- (19-mm-) diameter steel bar rungs fitted in centerline of siderails, plug-welded, and ground smooth on outer rail faces. Provide nonslip surfaces on top of each rung.  
4. Aluminum Ladder Construction: Extruded channel or tube siderails, not less than 2-1/2 inches (64 mm) deep, 3/4 inch (19 mm) wide, and 1/8 inch (3.2 mm) thick; with extruded tube rungs, not less than 3/4 inch (19 mm) deep and not less than 1/8 inch (3.2 mm) thick, fitted into centerline of siderails and fastened by welding or with stainless-steel fasteners or brackets and aluminum rivets. Provide rungs with ribbed tread surfaces.

#### FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Finish metal fabrications after assembly.  
B. Steel and Iron Finishes:  
1. Hot-dip galvanize items as indicated to comply with ASTM A 123/A 123M or ASTM A 153/A 153M as applicable.  
2. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below for environmental exposure conditions of installed metal fabrications:  
a. Extérieurs (SSPC Zone B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."  
b. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."  
3. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting," for shop painting.

#### EXECUTION

A. General: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb, and true.  
1. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication.  
2. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.  
3. Provide temporary bracing or anchorage in formwork for items that are to be built into concrete, masonry, or similar construction.  
B. Set bearing and leveling plates on cleaned surfaces using wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts and pack solidly with nonshrink, nonmetallic grout.  
D. Touch up surfaces and finishes after erection.  
1. Painted Surfaces: Clean field welds, bolted connections, and abraded areas and touch up paint with the same material as used for shop painting.  
2. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780

#### STAIRS AND RAILING - Section 05510

Provide and install Shop-fabricated steel stair assemblies complete with precast concrete treads and steel tube railing for stairs and balconies.

#### QUALITY ASSURANCE

A. Fabricator Qualifications: Metal stair work shall be performed by a fabricator specializing in the fabrication of type of metal stairs and rail assemblies required for this project, with a minimum of 5 years of documented successful experience, and have the facilities capable of meeting all requirements of Contract Documents. Materials, products and methods used in fabrication work shall not contain lead, asbestos or polychlorinated biphenyls (PCB).  
1. Stair and railing design shall be sealed and signed by a Professional Engineer licensed in the state in which this Project is located.

#### SUBMITTALS

A. Shop Drawings: Submit but not be limited to:  
1. All details and information indicating full compliance with applicable building code and Contract Documents.  
2. Elevations of stairs showing stair size, rail height and sizes.  
3. Elevations of Design handrail assemblies showing rail height, sizes, new type and thickness, profiles of metal sections and all details required to complete each type of handrail work.  
4. Plan view and dimensions of all stairs and handrail assemblies including relationship and dimension to adjacent building framing members.  
5. Type of landing and precast concrete treads.  
6. All details required to complete all stair and railing work.  
7. Sizes, thicknesses, profiles and ASTM quality of metal components.  
8. Each type of connection required to fit all. Conditions and design requirements specified.  
9. Work to be built-in or provided by other trades.  
10. Welded connections using AWS welding symbols.  
11. Method of securing stair assemblies to building structure.  
12. Type of surface preparation and SSPC method.  
13. Type, quality and mill thickness of shop primer for stairs and rail assemblies.  
14. Before submitting to Architect, shop drawings must be sealed and signed by a Professional Engineer licensed in the state in which the Project is located.  
B. Test Reports: Submit with shop drawings copies of test reports from a testing laboratory which certifies the quality, performance and water absorption test for precast concrete stair treads.

#### DELIVERY, STORAGE, HANDLING

A. Stairs, railing assemblies and accessories shall be delivered, stored and handled in the following manner:  
1. Handle and store materials off the ground to prevent damage.  
2. Place fabricated assemblies in a position which will minimize water-holding pockets, soiling, contamination and deterioration of shop primer.  
3. Deliver stair anchoring devices in sufficient time to avoid delay to the work.

#### MANUFACTURERS

A. Stair and railing system of the following manufacturers are acceptable only after full compliance with requirements of this section, Contract Documents.  
1. American Stair / Willow Springs, IL (800) 872-7824  
2. Texas Stairs and Rails Inc. / Houston, TX (800) 633-6874

#### MATERIALS

A. General: Materials and components specified establish the minimum functional, aesthetic and quality standards required for metal stair and railing work.  
1. Substitutions: Acceptable only after full compliance with the requirements of this section, Section 01630, Contract Documents and Owner's written approval.  
B. Provide all materials and components required to complete the stair fabrication in compliance with requirements of Contract Documents, including but not limited to the following:  
1. American Stair / Willow Springs, IL: Steel of sizes required or indicated on Drawings.  
2. Sections, Plates, Sheet, Bars: ASTM A36 structural quality steel.  
3. Bolts, Nuts, Washers: ASTM A325 high strength steel.  
4. Welding Materials: ASTM A325 D1.1, type required for materials being welded.

#### STAIR DESIGN AND FABRICATION

A. General: Verify dimensions on site prior to shop fabrication.  
1. Fabricate stair assemblies in accordance with approved shop drawings, applicable building code and Contract Documents.  
2. Stairs shall be of welded construction.  
3. Fabricate items with joints tightly fitted and secured.  
4. Exposed Connections: Form with hairline joints, flush and smooth.  
5. Exposed Edges: Grind smooth.  
6. Exposed Welds: Grind flush with adjacent finished surface.  
7. At Locations Exposed to view Use plastic filler between welds; sand flush and smooth.  
8. Concealed Fasteners: Use wherever possible.  
9. Exposed Fasteners: Countersunk flat-head type.  
10. Fit and shop-assemble sections in largest practical sizes, for handling through building openings.  
11. Sections shall be clearly marked for coordinated installations.  
B. Stringer and Landing Assembly: Design for minimum live load of 100 lbs. per sq. ft. with deflection of stairs and landings not exceeding 1/360 of span when underside is scheduled to be finished and 1/240 of span when underside is not being finished.  
1. Stringers: Steel channels of minimum sizes indicated on Drawings.  
2. Closures: Provide at ends of stringers.  
C. Pen Type Landings: Form from minimum 12 gauge sheet steel. Reinforce underside of landings with angles, as detailed or required.  
1. Reinforcement: Place 6 x 6 W14 x W1.4 welded wire fabric reinforcement in trends and landing prior to pouring concrete.  
D. Stair Treads: Precast concrete stair treads secured to stringer with structural steel clip angles as required to meet design load requirements.  
B. Treads shall be tested and certified by a Testing Laboratory for flexural and compressive strength. Testing Laboratory shall certify the percentage of water absorption. Treads must resist water absorption so freeze-thaw and/or salt water environments will not spall the concrete and corrode the reinforcing steel.

#### HANDRAIL DESIGN AND FABRICATION

A. Handrails for Stairs and Balconies: Welded steel tube rail assembly welded to stringers to resist a lateral force of 250 Lbs at any point on top rail without damage or permanent set in compliance with OSHA requirements.

1. Tube Type: ASTM A153, cold-formed, structural quality, of size and shape indicated on Drawings.  
B. Handrail Fabrication: Handrails shall be shop-fabricated in accordance with approved shop drawings, structural calculations, applicable building code and Contract Documents, including but not limited to the following:  
1. Handrail system shall be of welded construction.  
2. Dimensions: Verify on site prior to shop fabrication.  
3. Fit and shop-assemble railing sections in largest practical sizes, for handling through building openings.  
4. Joints: Shall be fully welded and ground smooth.  
5. Intersections: Where tubes intersect with tubes, and pipes intersect with pipes, but the ends to closely fit contour of tube and pipe joint, weld and grind smooth.  
6. Exposed Edges: Grind smooth.  
7. Exposed Welds: Grind flush with adjacent finished surface.  
8. Grinding Marks on Exposed Surfaces: Not acceptable.  
9. Exposed and Concealed Fasteners: Not acceptable.  
10. Ends of Railings: Close open ends with plates of same type metal as rails; weld and ground smooth.  
11. Curves: Form simple and compound curves by bending rails in jigs to produce uniform curves. Maintain profile of rails throughout entire bend without buckling, twisting or otherwise deforming exposed surfaces.  
12. Assembly Marks: Sections shall be clearly marked for coordinated installation.

#### FINISH

A. General: In addition to interior items scheduled below, shown or required, the following shall be painted as part of interior painting:  
1. All surfaces which will remain exposed to view, except factory finished items.  
2. Factory-primed items which will remain exposed to view.  
3. Mechanical and electrical equipment such as electrical panels where they occur in finished rooms and spaces and are not factory painted.

4. Shop-fabricated cabinet surfaces, including interiors that are not covered with laminated plastic.  
5. Finish hardware specified as USP, door seats and weather stripping.  
6. Exposed underside of structures and decks where applicable.  
7. Design intent: Design handrail assemblies (all those except handrail), balusters and panel fillers, to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot, including openings and space between rails.  
8. Hollow metal doors and frames.  
9. Shop-primed metal in exposed locations.  
10. Light fixture trims in gypsum wallboard.

#### INSTALLATION

A. Install stair and rail assemblies square, level, plumb and free from distortion or defects detrimental to appearance and performance.  
1. Comply with approved shop drawings and Contract Documents.  
2. Stairs and rails shall be aligned with adjacent construction.  
3. Coordinate stairs and rails with related work to ensure no interruption in installation.  
4. Perform necessary cutting and altering for installation of work of other sections.  
B. Bolted Connections: Conceal bolts and screws wherever possible.  
1. Where not hidden, use flush countersunk fastenings, unless indicated otherwise.  
C. Field Welding: Perform welding in accordance with AWS D1.1.  
1. Strip and clean primed steel items to bare metal before welding.  
2. For Exposed Locations: Grind welds smooth and flush to match shop-fabricated quality.

#### TOUCH-UP AND CLEANING

A. After installation, touch-up field welds, and scratched and damaged shop-primer.  
1. Touch-up damaged shop coat with primer matching the shop coat.  
B. Thoroughly clean the stairs and rail assemblies.

#### HANDRAILS AND RAILINGS - SECTION 05520

Provide and install steel pipe handrails, balusters, and fittings, where not associated with stairs or balconies.

#### DESIGN REQUIREMENTS

A. Design railing assembly, wall rails, and attachments to resist lateral force of 200 lbs. at any point without damage or permanent set. Test in accordance with ASTM E 935.

#### SUBMITTALS

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

#### MATERIALS

A. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.  
B. Pipe: ASTM A 53, Grade B Schedule 40, black finish.  
C. Fittings: Elbows, T-shapes, wall brackets, escutcheons; cast steel in concrete  
D. Mounting: Brackets and flanges, with steel inserts for casting in concrete  
E. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design rail height.  
F. Spigots: Steel concealed spigots.  
G. Shop and Touch-Up Primer: SSPC Paint 15, Type1 – Red Oxide

#### FABRICATION

A. Fit and shop assemble components in largest practical sizes for delivery to site.  
B. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.  
C. Provide anchors and plates required for connecting railings to structure.  
D. Exposed Mechanical Fastenings: Unobtrusively located; consistent with design of component, except where specifically noted otherwise.  
E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.  
F. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.  
G. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints but thigh, flush, and hairline. Ease exposed edges to small uniform radius.  
H. Accurately form components to suit specific project conditions and for proper connection to structure.  
1. Accommodate for expansion and contraction of members and structure movement without damage to connection or members.

WARRENTY:  
A. Endorse and forward to Owner manufacturer's twenty year finish warranty covering refinishing of fluoropolymer coating due to checking, crazing, peeling, chalking or fading, beginning at Date of Substantial Completion.

#### GENERAL MATERIAL REQUIREMENTS:

A. Materials shall be free from defects impairing strength, durability or appearance. Exposed surfaces throughout project shall have the same inherent texture and color for like locations.

B. Fasteners: Exposed fasteners shall be of same materials, color and finish as material to which applied, shall be countersunk and finished flush.

MATERIALS:  
A. Extrusions: 6063 alloy, T5 or T6 temper, meeting ASTM B221-02, 0.125" minimum wall thickness.  
B. Pipe: 6063 alloy, T6 temper meeting ASTM B241-02; 0.125" minimum wall thickness. Pipe sizes indicated on the drawings are Nominal Pipe Sizes.  
C. Sheet and plate: 5005-H34 alloy meeting ASTM B209-02a; minimum 0.050" thickness for sheet; 0.125" thickness for plate.  
D. Castings: 356-T6 alloy meeting ASTM B108-02.  
E. Handrail wall brackets: Stainless steel with wall plate drilled to receive one 3/8" diameter bolt.  
F. Bituminous coating: Cold-applied, asphalt mastic meeting SSPC-Paint 12.  
G. Perforated Metal Panels: see Drawings for product selection.

#### ERECTION TOLERANCES

A. Maximum Variation From Plumb: ¼ inch per floor level, noncumulative.  
B. Maximum Offset From True Alignment: ¼ inch.  
C. Maximum Out-of-Position: ¼ inch

#### EXTERIOR ALUMINUM RAILINGS - SECTION 055220

Work of this section includes exterior aluminum railings. Related work specified elsewhere:  
1. Concrete.  
2. Anchoring cement.  
3. Concrete unit masonry.

#### PERFORMANCE REQUIREMENTS:

1. Architectural aluminum railings and grill work shall resist wind load pressures for cladding in accordance with locally adopted International Building Code.  
2. Design wind speed shall be as scheduled on structural drawings.  
3. Design, fabricate and install architectural aluminum railings and grill work to withstand wind loads specified on structural drawings.  
4. Attachment of architectural aluminum railings and grill work to adjacent substrates shall be designed by architectural aluminum railings and grill work manufacturer.  
B. Design, fabricate and install guardrails to withstand the following loads applied separately:  
1. Handrails and Guards: Design handrail assemblies and guards to resist a load of 50 pounds per linear foot (pound per foot) applied in any direction at top and to transfer this load through supports to structure.

a. Concentrated Load: Provide handrail assemblies and guards able to resist a single concentrated load of 200 pounds applied in any direction at any point along top, and provide attachment devices and supporting structure to transfer this loading to appropriate structural elements of building.  
b. Components: Design handrail assemblies (all those except handrail), balusters and panel fillers, to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot, including openings and space between rails.  
c. Stress Increase: Where handrails and guards are designed in accord with provisions for allowable stress design (working stress design) exclusively for loads specified in Building Code, allowable stress for members and their attachments may be increased by one-third.  
A. Guardrails shall comply with ADA requirements.

#### SUBMITTALS:

A. Shop drawings: Indicate sizes, shapes, configuration, sections, locations, fabrication and installation details. Indicate fabricated sizes. Indicate that railings meet code requirements for vertical and horizontal loading. Include dimensioned plan of built-in anchorage devices, materials, finishes and itemization of parts and accessories.  
B. Product data: Indicate product description for specified coating system and instructions for preparation of surfaces to receive coatings, rates and methods of applications and finishes to be expected in finished work.  
C. Samples:  
1. Color and finish samples: Indicating colors and finishes to be expected in finished work.  
2. Railings: Submit full height by 2'-0" long sample of each type railing with post and rails, indicating construction, welded joints, handrail brackets and finish.  
D. Maintenance data: Submit for prefabricated aluminum including cleaning materials, methods and precautions.  
E. Welder certification: Submit welders' qualifications in accord with AWS D1.2, current within the previous 12 months, for Architect's information only.

#### QUALITY ASSURANCE:

A. Allowable tolerances:  
1. Machine field and shop assembled mechanical joints shall fit within ±1/32".  
2. Sizes of each element of an assembly shall be correct within 1/8"; total size of a freestanding assembly shall be correct within 1/2".  
3. Install railings plumb and aligned within 1/4" in 12'-0", and parallel with adjacent surfaces to within 1/4".  
4. Concrete block outs and inserts shall be spaced within ± 3/8", aligned within ±1/4" and plumbed within ±1/8".  
B. Applicable standards:  
1. American Architectural Manufacturers Association (AAMA), standards as referenced herein.  
2. ASTM International (ASTM), standards as referenced herein.  
3. American Welding Society (AWS).  
a. AWS D1.2, "Structural Welding Code -Aluminum,"  
b. AWS B2.1, "Welding Procedure and Performance Qualification,11  
C. Qualifications of welders:  
1. 1. Welders employed on the work shall have passed qualification tests within the past 12 months in the position for which employed, in accord with AWS D1.2 test procedures.  
2. Contractor shall require any welder to retake the qualification test when, in Architect's opinion the welder's work creates a reasonable doubt as to welder's proficiency. Conduct requalification tests at no additional expense to Owner. Make recertification to Architect after welder has passed retest.  
D. Field measurements: Take field measurements prior to preparation of shop drawings and fabrication to ensure fitting of work.

#### DELIVERY, STORAGE AND HANDLING:

A. Transport, deliver and store railings with expanded polystyrene pads or damage between units to prevent marring and chipping.  
B. Handle units in shop and at jobsite using fabric or other non-abrasive slings; use no metal or abrasive slings.

#### PROJECT/SITE CONDITIONS:

A. Protection: Protect aluminum surfaces from contact with lime, mortar, cement, acids and other harmful surfaces and from careless handling, storage or machining.

#### WARRENTY:

A. Endorse and forward to Owner manufacturer's twenty year finish warranty covering refinishing of fluoropolymer coating due to checking, crazing, peeling, chalking or fading, beginning at Date of Substantial Completion.

#### GENERAL MATERIAL REQUIREMENTS:

A. Materials shall be free from defects impairing strength, durability or appearance. Exposed surfaces throughout project shall have the same inherent texture and color for like locations.

B. Fasteners: Exposed fasteners shall be of same materials, color and finish as material to which applied, shall be countersunk and finished flush.

#### MATERIALS:

A. Extrusions: 6063 alloy, T5 or T6 temper, meeting ASTM B221-02, 0.125" minimum wall thickness.  
B. Pipe: 6063 alloy, T6 temper meeting ASTM B241-02; 0.125" minimum wall thickness. Pipe sizes indicated on the drawings are Nominal Pipe Sizes.  
C. Sheet and plate: 5005-H34 alloy meeting ASTM B209-02a; minimum 0.050" thickness for sheet; 0.125" thickness for plate.  
D. Castings: 356-T6 alloy meeting ASTM B108-02.  
E. Handrail wall brackets: Stainless steel with wall plate drilled to receive one 3/8" diameter bolt.  
F. Bituminous coating: Cold-applied, asphalt mastic meeting SSPC-Paint 12.  
G. Perforated Metal Panels: see Drawings for product selection.

#### REFERENCES

A. AFPA WCD No. 1 - Manual for Wood Frame Construction; American Forest and Paper Association; 1988.  
B. AWWA C2 - Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes; American Telephone and Electrical panel boards.  
C. PS I - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.  
D. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 1994.  
E. SPIB (SPIB) - Standard Grading Rules for Southern Pine Lumber, Southern Pine Inspection Bureau, Inc.; 1994.  
F. WWPFA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 1995.

#### SUBMITTALS

A. Product Data: Provide technical data on wood preservative materials.

#### QUALITY ASSURANCE

A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.  
1. Acceptable Lumber Inspection Agencies: SPIB and WWPFA.  
2. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

#### DELIVERY, STORAGE, AND HANDLING

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

H. Continuous weld components all around in accord with AWS standards to fuse without undercut, overlap or distortion of rail material.  
I. Grind exposed welds smooth and flush, matching and blending adjacent contours and surfaces without weakening base metal.  
J. Remove burrs and roughness from exposed cut edges of fabricated elements.  
K. Perform fabrication prior to shop finishing.  
L. Provide protected pressure relief and weep holes in exterior railings.

#### PREPARATION AND SHOP APPLICATION OF COATING SYSTEM:

A. Surfaces to receive finishes shall be dry and free of debris, oils, dust or other deleterious materials.  
B. Prior to undercoat application clean all metal surfaces in accord with SSPC-SP1, Solvent Cleaning.  
C. Apply coating materials to clean surfaces in accord with manufacturer's product data to achieve specified dry film thicknesses. Apply materials using clean equipment of type recommended by system manufacturer's product data. Where railings cannot be manufactured in full length, mask at locations of field welds.  
D. Comply with manufacturer's product data for drying time between coats.  
E. Finish coats shall be smooth, free of streaks, laps or pile-up of coating materials, skipped or missed areas.

#### PREPARATION:

A. Inserts and anchorages:  
1. Furnish inserts, sleeves and anchoring devices to be set in concrete for installation of railings.  
2. Provide back-up plates for bolted connections.  
3. Coat components and anchors to be built into concrete and masonry construction using bituminous coating, 15 mils minimum dry film thickness.  
B. Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorages, concrete inserts, anchor bolts and items having integral anchors to be embedded in concrete construction.  
C. Shop assembly: Preamseable items in shop to greatest extent practicable to minimize assembly of units at project site. Disassemble units to extent necessary for shipping and handling limitations. Mark units for reassembly.

#### INSTALLATION:

A. General:  
1. Set work in location, alignment and elevation, plumb and level, true and free of rack; measured from established lines and levels. Perform cutting, drilling and fitting required for installations of work. Install in accord with approved shop drawings.  
2. Secure railings to wall back-up plates as indicated on approved shop drawings.  
3. Set railings within specified installation tolerances as specified herein.  
4. Fit exposed connections together to form hairline joints.  
5. Protect aluminum in contact with masonry, steel, concrete or other dissimilar material using bituminous coating. Maintain exposed surfaces free of bituminous material.  
C. Setting posts:  
1. Clean and moisten concrete blackouts; clean sleeve inserts.  
2. Place, align and brace railing system; shim post at bottom of permanent blackout or oversized sleeve.  
3. Grout posts solid with anchoring cement as specified in Mortar and Masonry Grout section, flush with blockout edge and sloped up 1/8" onto post for drainage.  
D. Field connections:  
1. Set railings in field using internal connectors.  
2. Weld joints continuous and grind smooth, flush with railing surface.  
3. Prepare field welded surfaces and surfaces damaged during shipping or installation to receive field finish by cleaning in accord with SSPC-SP1. Prevent damage to shop applied finish.  
E. Wall handrails:  
1. Support wall handrails on brackets spaced uniformly not more than 5'-0" o. c. and within 1'-0" of rail ends.  
2. Install brackets with expansion bolts in concrete and solid masonry, toggle bolts in hollow masonry and drywall.  
3. Attach railing to brackets using concealed fasteners.  
F. Expansion control: Provide 1/2" minimum expansion control joints at 30'-0" O.C. maximum. Secure internal connectors at expansion joints securely to one side, extending not less than 2" on each side of joint. Locate within 6" of posts.  
G. Just prior to Date of Substantial Completion, examine railings for damage. Repair or replace work damaged or stained by subsequent work.  
1. Clean factory painted aluminum components in accord with AAMA 610.1.  
2. Touch-up field welds and damaged finish matching shop applied finish.

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2. Touch-up field welds and damaged finish matching shop applied finish.

#### ROUGH CARPENTRY - SECTION 06100

Provide and install the following:  
A. Structural floor, wall, and roof framing.  
B. Floor, wall, and roof sheathing.  
C. Furring for panel siding  
D. Preservative treatment of wood.  
E. Miscellaneous framing sheathing.  
F. Telephone and electrical panel boards.  
G. Wood nailers, curbs, and cant strips for roofing and items installed on roof.  
H. Concealed wood blocking for support of toilet and bath accessories, wall cabinets, wood trim, and other items.  
I. Miscellaneous wood nailers and turning strips.

WARRENTY:  
A. Endorse and forward to Owner manufacturer's twenty year finish warranty covering refinishing of fluoropolymer coating due to checking, crazing, peeling, chalking or fading, beginning at Date of Substantial Completion.

#### SUBMITTALS

A. Product Data: Provide technical data on wood preservative materials.

#### QUALITY ASSURANCE

A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.  
1. Acceptable Lumber Inspection Agencies: SPIB and WWPFA.  
2. Lumber of other species or grades, or graded by other agencies, is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

#### DELIVERY, STORAGE, AND HANDLING

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

#### DIMENSION LUMBER

A. Sizes: Nominal sizes as indicated on drawings, S4S Exposure Class: 1  
B. Moisture Content: S-dry or MC19:  
C. Stud Framing (2 x 2 through 1 x 6)  
D. Species: Any allowed under referenced grading rules and in conformance with requirements on structural drawings  
E. Grade: See structural drawings  
F. Joist, Rafter, and Small Beam Framing (2 x 6 through 4 x 16)  
G. Species and Grades: As indicated on the drawings for various locations.  
H. Miscellaneous Blocking, Furring, and Nailers:  
I. Lumber S4S, No. 3 or Utility Grade.  
J. Boards: Standard or No. 3.

#### CONSTRUCTION PANELS

A. Subfloor/Underlayment Combination: APA Rated Sturd-I-Floor  
1. Exposure Class: 1  
2. Span Rating: 48/24  
3. Thickness: 23/32 inches  
B. APA Rated Roof Sheathing: Exposure 1, and as follows:  
1. Structural 1  
2. Span Rating: 32/16  
3. Thickness: 15/32".  
C. APA Rated Wall Sheathing: As indicated on drawings.  
D. APA Rated Wall Sheathing: As indicated on drawings.  
E. Miscellaneous Panels:  
1. Concealed Plywood: PS 1, C-C Plugged, exterior grade.  
2. Exposed Plywood: PS 1, A-D, interior grade.  
3. Electrical Component Mounting: APA rated sheathing, fire retardant treated.

#### WOOD FURRING FOR FIBER CEMENT PANEL RAINSCREEN SYSTEMS

A. Reference related section for Fiber Cement Panels.  
B. Material must be Spruce-Pine-fir or any wood species with a specific gravity of 0.42 or greater in accordance with the American Forest and Paper Association (AFPA) and American Wood Council National Design Specification (NDS).  
C. Wood furring shall conform to building code for natural decay resistance or treated lumber (per the International Building Code). Typical wood rainscreen includes treated 3/8" or 3/4" thick plywood or treated nominal 1x4 lumber (actual 3/4" thick).  
D. Furring must create a minimum of 3/8" air gap behind the fiber cement panel.

#### ACCESSORIES

A. Fasteners and Anchors:  
1. Fasteners: Hot-dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.  
2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.  
3. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.  
B. Die-Stamped Connectors: as shown on drawings, hot dipped galvanized steel  
C. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, glass fiber strip.  
D. Sill Flashing: As specified in Section 07620.  
E. Subfloor Glue: Waterproof, water base, air cure type, cartridge dispensed.  
F. Building Paper No. 15 asphalt felt or spun bonded polyethylene.

#### FACTORY WOOD TREATMENT

A. Pressure Treatment of Lumber Above Grade: AWWA Treatment C2 using waterborne preservative to