

SECTION 06401 – EXTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Site drawings produced by Pinkham and Greer Consulting Engineers, foundation/basement plan drawings produced by TFH Architects PA and Structural Design Consulting, building drawings produced by TFH Architects, mechanical drawings produced by Whitney Engineering, electrical and lighting drawings produced by Bennett Engineers. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections apply to all sections.

1.2 SUMMARY

- A. This Section includes the providing and installation of the following items provided by the Modular Components Supplier of the following:

- 1. Exterior standing and running trim.
- 2. Exterior decking and railings.
- 3. Lumber siding / wood clapboard siding.
- 4. Finished mounts for electrical and plumbing devices.
- 5. Porch columns.
- 6. Porch soffits.
- 7. Trash container enclosure.

- B. Related Sections include the following:

- 1. Division 6 Section "Rough Carpentry" for furring, blocking, and other carpentry work not exposed to view.
- 2. Division 6 Section "Interior Architectural Woodwork" for interior woodwork not specified in this Section.
- 3. Division 7 Section "Vinyl Siding".
- 4. Division 9 Section "Painting" for priming and backpriming of finish carpentry.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Handrails and Railings: Provide handrails and railings capable of withstanding the following structural loads without exceeding allowable design working stresses of materials for handrails, railings, anchors, and connections:

- 1. Top Rail of Guards: Capable of withstanding the following loads applied as indicated:
 - a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf/ft. (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf/ft. (1460 N/m) applied vertically downward.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
- 2. Handrails Not Serving As Top Rails: Capable of withstanding the following loads applied as indicated:

- a. Concentrated load of 200 lbf (890 N) applied at any point and in any direction.
 - b. Uniform load of 50 lbf/ft. (730 N/m) applied in any direction.
 - c. Concentrated and uniform loads above need not be assumed to act concurrently.
- B. Thermal Movements: Provide handrails and railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections if not provided under Division 13.
- B. Wood treatment data as follows including chemical treatment manufacturer's instructions for handling, storing, installing and finishing treated material.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
- C. Samples for Verification:
1. For each species and cut of lumber and panel products with nonfactory-applied finish, with 1/2 of exposed surface finished, **50 sq. in. (300 sq. cm)** for lumber and **8 by 10 inches (203 by 250 mm)** for panels.
- D. Shop Drawings: Show fabrication and installation of handrails and railings. Include plans, elevations, sections, component details, and attachments to other Work.
1. For installed handrails and railings indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed finish carpentry similar in material, design and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for

installations of handrails and railings that are similar to those indicated for this Project in material, design, and extent.

- C. Source Limitations: Obtain each type of handrail and railing through one source from a single manufacturer or fabricator.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Material will be delivered within modular units. Upon receipt continue to protect materials against weather and contact with damp or wet surfaces if removed from units. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.
- B. Store handrails and railings in a dry, well-ventilated, weather-tight place.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install interior finish carpentry until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit work to be performed according to manufacturer's written instructions and warranty requirements and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.
- C. Field Measurements: Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating handrails and railings without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

- A. Coordinate installation of anchorages for handrails and railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.9 SCHEDULING

- A. Schedule installation so handrails and railings are mounted only on completed walls. Do not support temporarily by any means that does not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 SOURCE

- A. Local lumber supplier.

2.2 MATERIALS

- A. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by the American Lumber Standards' Committee Board of Review.
- B. Inspection agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
 - 1. NELMA – Northeastern Lumber Manufacturers Association.
 - 2. NHLA – National Hardwood Lumber Association.
 - 3. NLGA – National Lumber Grades Authority.
- C. Grade stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- D. Softwood Plywood: DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."

2.3 EXTERIOR STANDING AND RUNNING TRIM AND COLUMN COVERINGS

- A. Material: cellular polyvinyl chloride.
- B. Size: nominal 1" and 5/4 inch thick as indicated on drawings; width as indicated on drawings. Color white.
- C. Manufacturer: Azek Trim Boards (www.azek.com)

2.4 FINISH MOUNTING BLOCKS AND PORCH AND EAVE SOFFITS

- A. Material: cellular polyvinyl chloride.
- B. Size: soffits ½"; mounting blocks 1" – sheet goods.
- C. Manufacturer: Azek Trim Boards.

2.5 EXTERIOR RAILING SYSTEM

- A. Material: polyvinyl chloride (PVC), guard rail components, steel or aluminum reinforced as required. Fasteners stainless steel.
- B. Size: top rail 3 x 1" +/- with 1-3/4 vertical support; posts 4 x 4; balusters 1-1/4 x 1-1/4; bottom rail 1-1/2 x 3-1/2.
- C. Manufacturers:
 - 1. EverNew Guard Rail Systems by CertainTeed or approved wqual.
- D. Accessories: utilize manufacturer's galvanized steel mounting systems wherever possible.

2.6 METALS

- A. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.7 EXTERIOR DECKING

- A. Material: plastic wood composite; factory primed.
- B. Size: 7/8 x 5-1/4; tongue and groove.
- C. Ancillary components: half round edging; all exposed edges; quarter round to close underside from framing.

2.8 MISCELLANEOUS MATERIALS

- A. Fasteners for Exterior Finish Carpentry: Provide nails or screws of the following materials, in sufficient length to penetrate minimum of **1-1/2 inches (38 mm)** into substrate, unless otherwise recommended by manufacturer or national association:
 - 1. Stainless steel.
 - 2. Hot-dip galvanized steel. (Not allowed in contract with pressure treated wood).
- B. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.
 - 1. Where finish carpentry materials are exposed in areas of high humidity, provide fasteners and anchorages with hot-dip galvanized coating complying with ASTM A 153/A 153M.
- C. Fasteners for Anchoring Handrails and Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads.
 - 1. For steel handrails, railings, and fittings, use plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
- D. Fasteners for Interconnecting Handrail and Railing Components: Use fasteners fabricated from same basic metal as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
 - 1. Provide concealed fasteners for interconnecting handrail and railing components and for attaching them to other work, unless otherwise indicated.
- E. Cast-in-Place and Post-installed Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
 - 1. Cast-in-place anchors.
 - 2. Chemical anchors.
 - 3. Expansion anchors.

- F. Sealants: Comply with requirements in Division 7 Section "Joint Sealants" for materials required for sealing siding work.
- G. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.9 FABRICATION

- A. Wood Moisture Content: Comply with requirements of specified inspection agencies and with manufacturer's written recommendations for moisture content of finish carpentry at relative humidity conditions existing during time of fabrication and in installation areas.
- B. General: Fabricate handrails and railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- C. Assemble handrails and railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- D. Form changes in direction of railing members as follows:
 - 1. By inserting prefabricated flush-elbow fittings.
- E. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect handrail and railing members to other work, unless otherwise indicated.
- F. Provide inserts and other anchorage devices for connecting handrails and railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by handrails and railings. Coordinate anchorage devices with supporting structure.
- G. For railing posts set in concrete, provide preset sleeves of steel not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (12 mm) greater than outside dimensions of post, and steel plate forming bottom closure.
- H. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members that are exposed to exterior or to moisture from condensation or other sources.
- I. Fabricate joints that will be exposed to weather in a watertight manner.
- J. Close exposed ends of handrail and railing members with prefabricated end fittings.
- K. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns, unless clearance between end of railing and wall is 1/4 inch (6 mm) or less.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Before installing finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours, unless longer conditioning is recommended by manufacturer.
- C. Prime lumber all surfaces for exterior applications to be painted, including both faces and edges. Cut to required lengths and prime ends. Comply with requirements in Division 9 Section "Painting."

3.3 INSTALLATION, GENERAL

- A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.
- B. Install finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
 - 3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
 - 4. Coordinate finish carpentry with materials and systems in or adjacent to it. Provide cutouts for 5/4 wood mounting blocks to accommodate mechanical and electrical items that penetrate siding where not provided by MCS. Blocks to align with clapboard coursing with a width suitable to accommodate the mouting of the fixture or device.
- C. Adjust handrails and railings before anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated, but not less than that required by structural loads.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing handrails and railings and for properly transferring loads to in-place construction.

3.4 STANDING AND RUNNING TRIM INSTALLATION (exposed)

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joining of trim. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.

1. Match color across joints.
2. Install trim after gypsum board joint finishing operations are completed.
5. Fit exterior joints to exclude water. Apply flat grain lumber with bark side exposed to weather.

3.5 SIDING INSTALLATION (alternate if so indicated on drawings)

- A. Fiber cement siding siding in lieu of vinyl clapboard where indicated on drawings: Apply starter strip along bottom edge of sheathing or sill. Install first course of siding with lower edge at least 1/8 inch (3 mm) below starter strip and subsequent courses lapped a minimum 1 inch (25 mm) over course below. Nail at each stud. Do not allow nails to penetrate more than one thickness of siding.
- B. Install siding to comply with industry's recommendations to meet all warranty requirements.

3.6 RAILING INSTALLATION

- A. Secure newell posts with internal anchor bolts set in concrete fill as indicated on drawings and recommended by manufacturer.
- B. Exterior Railings: Secure wall rails with galvanized steel or cast aluminum brackets on aluminum wrapped 5/4 x 3" x 8" mounting blocks. Fasten freestanding railings to newell posts and to trim at walls with countersunk-head stainless steel screws. Flash as required.
- C. T&G Decking: Install in accordance with manufacturer's preferred recommendations. Finish with two coats of deck paint.
- D. Anchor railing ends into concrete and masonry with round flanges connected to railing ends and anchored into wall construction with post-installed anchors and bolts.
- E. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces.
 1. Weld flanges to railing ends.
 2. Connect flanges to railing ends using non-welded connections.
- F. Attach handrails to wall with wall brackets. Provide bracket with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface.
- G. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- H. Secure wall brackets to building construction as follows:
 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 2. For wood stud partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with carpentry work to locate backing members.
 3. For steel-framed gypsum board assemblies, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
 4. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.

3.7 ADJUSTING

- A. Replace finish carpentry that is damaged or does not comply with requirements. Finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.8 CLEANING

- A. Clean finish carpentry on exposed and semi exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.9 PROTECTION

- A. Provide final protection and maintain conditions that ensure finish carpentry is without damage or deterioration at the time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 06401