

**SECTION 06 10 00
ROUGH CARPENTRY**

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Section specifies wood blocking, framing, sheathing, furring, nailers, sub-flooring, rough hardware, and light wood construction.

1.2 RELATED WORK:

- A. Milled woodwork: Section 06 20 00, FINISH CARPENTRY.
- B. Gypsum sheathing: Section 09 29 00, GYPSUM BOARD.

1.3 SUBMITTALS:

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings showing framing connection details, fasteners, connections and dimensions.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Protect lumber and other products from dampness both during and after delivery at site.
- B. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.
- C. Stack plywood and other board products so as to prevent warping.
- D. Locate stacks on well drained areas, supported at least 150 mm (6 inches) above grade and cover with well ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

1.5 APPLICABLE PUBLICATIONS:

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in the text by basic designation only.
- B. American Forest and Paper Association (AFPA):
National Design Specification for Wood Construction
NDS-05.....Conventional Wood Frame Construction
- C. American Society of Mechanical Engineers (ASME):
B18.2.1-96(R2005).....Square and Hex Bolts and Screws
B18.2.2-87.....Square and Hex Nuts
B18.6.1-97.....Wood Screws
B18.6.4-98(R2005).....Thread Forming and Thread Cutting Tapping Screws
and Metallic Drive Screws
- D. American Plywood Association (APA):
E30-07.....Engineered Wood Construction Guide

- E. American Society for Testing And Materials (ASTM):
- A47-99(R2009).....Ferritic Malleable Iron Castings
 - A48-03(R2008).....Gray Iron Castings
 - A653/A653M-10.....Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process
 - C954-10.....Steel Drill Screws for the Application of Gypsum Board or Metal Plaster Bases to Steel Studs from 0.033 inch (2.24 mm) to 0.112-inch (2.84 mm) in thickness
 - C1002-07.....Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Metal Studs
 - F844-07.....Washers, Steel, Plan (Flat) Unhardened for General Use
 - F1667-08.....Nails, Spikes, and Staples
- F. Federal Specifications (Fed. Spec.):
- MM-L-736C.....Lumber; Hardwood
- G. Commercial Item Description (CID):
- A-A-55615.....Shield, Expansion (Wood Screw and Lag Bolt Self Threading Anchors)
- H. Military Specification (Mil. Spec.):
- MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated
- I. U.S. Department of Commerce Product Standard (PS)
- PS 1-95.....Construction and Industrial Plywood
 - PS 20-05.....American Softwood Lumber Standard

PART 2 - PRODUCTS

2.1 LUMBER:

- A. Unless otherwise specified, each piece of lumber bear grade mark, stamp, or other identifying marks indicating grades of material, and rules or standards under which produced.
1. Identifying marks in accordance with rule or standard under which material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
 2. Inspection agency for lumber approved by the Board of Review, American Lumber Standards Committee, to grade species used.
- B. Lumber shall be FSC certified.

C. Lumber Other Than Structural:

1. Unless otherwise specified, species graded under the grading rules of an inspection agency approved by Board of Review, American Lumber Standards Committee.
2. Furring, blocking, nailers and similar items 100 mm (4 inches) and narrower Standard Grade; and, members 150 mm (6 inches) and wider, Number 2 Grade.

D. Sizes:

1. Conforming to Prod. Std., PS20.
2. Size references are nominal sizes, unless otherwise specified, actual sizes within manufacturing tolerances allowed by standard under which produced.

E. Moisture Content:

1. At time of delivery and maintained at the site.
2. Boards and lumber 50 mm (2 inches) and less in thickness: 19 percent or less.
3. Lumber over 50 mm (2 inches) thick: 25 percent or less.

F. Fire Retardant Treatment:

1. Mil Spec. MIL-L-19140 with piece of treated material bearing identification of testing agency and showing performance rating.
2. Treatment and performance inspection, by an independent and qualified testing agency that establishes performance ratings.

G. Preservative Treatment:

1. Do not treat Heart Redwood and Western Red Cedar.
2. Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 600 mm (24 inches) from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members used in connection with roofing and flashing materials.
3. Treat other members specified as preservative treated (PT).
4. Preservative treat by the pressure method complying with ASTM D1760, except any process involving the use of Chromated Copper arsenate (CCA) for pressure treating wood is not permitted.

2.2 PLYWOOD

- A. Comply with Prod. Std., PS 1.
- B. Plywood shall not contain added urea-formaldehyde and shall be FSC certified.

- C. Bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of plywood which identifies compliance by veneer grade, group number, span rating where applicable, and glue type.
- D. Non-Performance Rated Plywood: Where plywood panels will be used for following types of applications, provide APA rated panels meeting requirements for grade designation, exposure durability classification, edge detail where applicable, and thickness. Plywood shall be 5 veneer plies minimum and shall bear APA grade mark. Adhesive shall be added urea-formaldehyde free.
 - 1. Backing Panels: For mounting electrical or communication equipment, provide fire retardant treated plywood panels with grade designation, APA A-A where both surfaces will be exposed in completed work or APA A-C where one surface will be exposed in completed work, Group 1 species, thickness required, but 75mm (3/4 inch) minimum thickness; Exposure Durability Classification of Exterior and square edge detail.

2.3 ROUGH HARDWARE AND ADHESIVES:

- A. General:
 - 1. Allowable Design Loads: Provide accessories with allowable design loads as published by manufacturers that meet values required by Contract Documents. Published values of manufacturer shall be determined from empirical data or by rational engineering analysis, and demonstrated by comprehensive testing performed by a qualified independent quality control service.
 - 2. Protective Coatings:
 - a. General:
 - 1) Where rough carpentry is located outdoors, in contact with ground or in area of high relative humidity, provide accessories which are hot-dip zinc coated steel with zinc coating meeting requirements of ASTM A123 and ASTM A153 as applicable for accessory item, except as otherwise specified in this Article, or stainless steel, Type 304.
 - 2) Except as otherwise required by Contract Documents, prime paint ferrous metal items with acrylic base, rust inhibitive primer acceptable to Architect. Provide 51 μ (2.0 mils) minimum dry film thickness. Prime painted surfaces shall be uniform.

- b. Preservative Treated Wood: Where accessories are in contact with preservative treated wood, provide accessories which have hot-dip zinc coated or stainless steel, Type 304. Zinc coating on steel sheet shall meet requirements of ASTM A653, Coating Designation G185, minimum.
- B. Anchor Bolts:
1. ASME B18.2.1 and ANSI B18.2.2 galvanized, 13 mm (1/2 inch) unless shown otherwise.
 2. Extend at least 200 mm (8 inches) into masonry or concrete with ends bent 50 mm (2 inches).
- C. Miscellaneous Bolts: Expansion Bolts: C1D, A-A-55615; lag bolt, long enough to extend at least 65 mm (2-1/2 inches) into masonry or concrete. Use 13 mm (1/2 inch) bolt unless shown otherwise.
- D. Washers:
1. ASTM F844.
 2. Use zinc or cadmium coated steel or cast iron for washers exposed to weather.
- E. Screws:
1. Wood to Wood: ANSI B18.6.1 or ASTM C1002.
 2. Wood to Steel: ASTM C954, or ASTM C1002.
- F. Nails:
1. Size and type best suited for purpose unless noted otherwise. Use aluminum-alloy nails, plated nails, or zinc-coated nails, for nailing wood work exposed to weather and on roof blocking.
 2. ASTM F1667:
 - a. Common: Type I, Style 10.
 - b. Concrete: Type I, Style 11.
 - c. Barbed: Type I, Style 26.
 - d. Underlayment: Type I, Style 25.
 - e. Masonry: Type I, Style 27.
 - f. Use special nails designed for use with ties, strap anchors, framing connectors, joists hangers, and similar items. Nails not less than 32 mm (1-1/4 inches) long, 8d and deformed or annular ring shank.
- G. Adhesives:
1. For field-gluing plywood to lumber framing floor or roof systems: ASTM D3498.
 2. For structural laminated Wood: ASTM D2559.

PART 3 - EXECUTION**3.1 INSTALLATION OF FRAMING AND MISCELLANEOUS WOOD MEMBERS:**

- A. Conform to applicable requirements of the following:
 - 1. AF&PA WCD 1, "Details for Conventional Wood Frame Construction," unless specified otherwise.
 - 2. APA for installation of plywood or structural use panels.
- B. Fasteners:
 - 1. Nails.
 - a. Nail in accordance with the Recommended Nailing Schedule as specified in AF&PA Details for Conventioanl Wood Frame Construction where detailed nailing requirements are not specified in nailing schedule. Select nail size and nail spacing sufficient to develop adequate strength for the connection without splitting the members.
 - b. Use special nails with framing connectors.
 - c. For sheathing and subflooring, select length of nails sufficient to extend 25 mm (1 inch) into supports.
 - d. Use eight penny or larger nails for nailing through 25 mm (1 inch) thick lumber and for toe nailing 50 mm (2 inch) thick lumber.
 - e. Use 16 penny or larger nails for nailing through 50 mm (2 inch) thick lumber.
 - f. Select the size and number of nails in accordance with the recommended Nailing Schedule specified in AF&PA Details for Conventioanl Wood Frame Construction, except for special nails with framing anchors.
 - 2. Bolts:
 - a. Fit bolt heads and nuts bearing on wood with washers.
 - b. Countersink bolt heads flush with the surface of nailers.
 - c. Embed in concrete and solid masonry or use expansion bolts. Special bolts or screws designed for anchor to solid masonry or concrete in drilled holes may be used.
 - d. Use toggle bolts to hollow masonry or sheet metal.
 - e. Use bolts to steel over 2.84 mm (0.112 inch, 11 gage) in thickness. Secure wood nailers to vertical structural steel members with bolts, placed one at ends of nailer and 600 mm (24 inch) intervals between end bolts. Use clips to beam flanges.
 - 3. Drill Screws to steel less than 2.84 mm (0.112 inch) thick.
 - a. ASTM C1002 for steel less than 0.84 mm (0.033 inch) thick.
 - b. ASTM C 954 for steel over 0.84 mm (0.033 inch) thick.

4. Power actuated drive pins may be used where practical to anchor to solid masonry, concrete, or steel.
5. Do not anchor to wood plugs or nailing blocks in masonry or concrete. Use metal plugs, inserts or similar fastening.
6. Screws to Join Wood:
 - a. Where shown or option to nails.
 - b. ASTM C1002, sized to provide not less than 25 mm (1 inch) penetration into anchorage member.
 - c. Spaced same as nails.
- C. Cut notch, or bore in accordance with NFPA Manual for House-Framing for passage of ducts wires, bolts, pipes, conduits and to accommodate other work. Repair or replace miscut, misfit or damaged work.
- D. Blocking Nailers, and Furring:
 1. Install furring, blocking, nailers, and grounds where shown.
 2. Use longest lengths practicable.
 3. Use fire retardant treated wood blocking where shown at openings and where shown or specified.
 4. Layers of Blocking or Plates:
 - a. Stagger end joints between upper and lower pieces.
 - b. Nail at ends and not over 600 mm (24 inches) between ends.
 - c. Stagger nails from side to side of wood member over 125 mm (5 inches) in width.
 5. UNLESS OTHERWISE SHOWN, USE WALL FURRING 25 MM BY 75 MM (1 INCH BY 3 INCH) CONTINUOUS WOOD STRIPS INSTALLED PLUMB ON WALLS, USING WOOD SHIMS WHERE NECESSARY SO FACE OF FURRING FORMS A TRUE, EVEN PLANE. SPACE FURRING NOT OVER 400 MM (16 INCHES ON CENTERS, BUTT JOINTS OVER BEARINGS AND RIGIDLY SECURE IN PLACE. ANCHOR FURRING ON 400 MM (16 INCHES) CENTERS.

3.2 INSTALLATION - PLYWOOD

- A. General: Meet requirements and recommendations of APA - Design/Construction Guide - Residential and Commercial, and other applicable APA recommendations.
- B. Layout:
 1. Install each layer of plywood with face grain perpendicular to supports and with panels continuous over two or more spans. Dimensions of panels shall not be less than 1 foot in any direction. Support edges. Plywood end joints shall occur over framing. Stagger joints one-half of plywood face dimension.
 2. Install plywood with best grade face exposed in completed work or to application side for installation of subsequent materials, if applicable.

C. Fastening Methods:

1. General:

- a. Method: Securely fasten to supporting construction in manner to prevent warpage at edges and joints.
- b. Framing: Continuously glue and nail or screw plywood panels at edges and intermediate supports to framing throughout, except as otherwise required by Contract Documents.
- c. Fastening: Nail or screw plywood panels at 150mm (6 inch) centers along panel edges and at 300mm (12 inch) centers at intermediate supports, except as otherwise indicated by Contract Documents. Use 10 penny (3.8mm (0.148 inch diameter) minimum nails for fastening to wood framing.

- 2. Backing Panels: Screw or bolt to supporting structure, except as otherwise required.

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SECTION 06 20 00
FINISH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies interior millwork.
- B. Items specified:
 - 1. Architectural woodwork includes woodwork exposed to view in the completed Work and fabricated to standard or custom design as applicable, primarily of wood, including high pressure laminates, and which is not a part of other work or wood systems in other Sections of Specifications.
 - 2. Architectural cabinets and countertops.
 - 3. Shelving
 - 4. Seats and benches
 - 5. Reception Desk
 - 6. Wood Handrail
 - 7. Items associated or integral with architectural woodwork, including:
 - a. Supports, reinforcement and like components, except as otherwise required by Contract Documents.
 - b. Wood grounds and blocking.
 - c. Hardware and accessories.

1.2 RELATED WORK

- A. Fabricated Metal Supports: Section 05 50 00, METAL FABRICATIONS.
- B. Framing, furring and blocking: Section 06 10 00, ROUGH CARPENTRY.
- C. Wood doors: Section 08 14 00, WOOD DOORS.
- D. Countertops: Section 12 36 00, COUNTERTOPS.
- E. Electrical light fixtures and duplex outlets: Division 26, ELECTRICAL.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings:
 - 1. Millwork items - Half full size scale for sections and details 1:50 (1/4-inch) for elevations and plans.
 - 2. Show construction and installation, including requirements for support, reinforcement and anchorage; and provisions and cut outs for interfacing work including mechanical, plumbing and electrical work.
 - 3. Indicate compliance with specified AWI-Quality Standards and specified requirements for materials and workmanship.

C. Samples:

- 1. Lumber and panel products with factory-applied opaque finish, 150 mm by 300 mm (6 by 12 inches) for panels and 50 square inches for lumber, for each finish system and color, with one half of exposed surface finished.
- 2. Plastic Laminates: Each type, color, pattern and sheen of finish, each 150 mm by 300 mm (6 by 12 inches).
- 3. Each type metal, 150 mm by 300 mm (6 by 12 inches), with each respective finish.
- 4. Hardware: Full size sample of each hardware item.

D. Certificates:

- 1. Indicating preservative treatment and fire retardant treatment of materials meet the requirements specified.
- 2. Indicating moisture content of materials meet the requirements specified.
- 3. Submit copies of certificate signed by architectural woodwork mill or fabricator, certifying architectural woodwork meets requirements of quality grades and other requirements specified. Submit certificate in form recommended by applicable standards.

E. List of acceptable sealers for fire retardant and preservative treated materials.

F. Manufacturer's literature and data:

- 1. Finish hardware

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect lumber and millwork from dampness, maintaining moisture content specified both during and after delivery at site.
- B. Store finishing lumber and millwork in weathertight well ventilated structures or in space in existing buildings designated by Resident Engineer. Store at a minimum temperature of 21⁰C (70⁰F) for not less than 10 days before installation.
- C. Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.

1.5 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American National Standards Institute (ANSI):
A117.1.....Accessible and Useable Building Facilities
- C. American Society of Testing and Materials (ASTM):
A36/A36M-08.....Structural Steel

- A53-12.....Pipe, Steel, Black and Hot-Dipped Zinc Coated,
Welded and Seamless
- A167-99 (R2009).....Stainless and Heat-Resisting Chromium-Nickel
Steel Plate, Sheet, and Strip
- B26/B26M-09.....Aluminum-Alloy Sand Castings
- B221-08.....Aluminum and Aluminum-Alloy Extruded Bars, Rods,
Wire, Profiles, and Tubes
- E84-10.....Surface Burning Characteristics of Building
Materials
- D. American Hardboard Association (AHA):
A135.4-04.....Basic Hardboard
- E. Builders Hardware Manufacturers Association (BHMA):
A156.9-03.....Cabinet Hardware
A156.11-10.....Cabinet Locks
A156.16-08.....Auxiliary Hardware
- F. Hardwood Plywood and Veneer Association (HPVA):
HP1-09.....Hardwood and Decorative Plywood
- G. National Particleboard Association (NPA):
A208.1-09.....Wood Particleboard
- H. American Wood-Preservers' Association (AWPA):
AWPA C1-03.....All Timber Products - Preservative Treatment by
Pressure Processes
- I. Architectural Woodwork Institute (AWI):
AWI-09.....Architectural Woodwork Quality Standards and
Quality Certification Program
- J. National Electrical Manufacturers Association (NEMA):
LD 3-05.....High-Pressure Decorative Laminates
- K. U.S. Department of Commerce, Product Standard (PS):
PS20-10.....American Softwood Lumber Standard
- L. Military Specification (Mil. Spec):
MIL-L-19140E.....Lumber and Plywood, Fire-Retardant Treated
- M. Federal Specifications (Fed. Spec.):
A-A-1922A.....Shield Expansion
A-A-1936.....Contact Adhesive
FF-N-836D.....Nut, Square, Hexagon Cap, Slotted, Castle
FF-S-111D(1).....Screw, Wood
MM-L-736(C).....Lumber, Hardwood
- N. United States Department of Justice (USDOJ):
ADA.....Americans with Disabilities Act

PART 2 - PRODUCTS**2.1 BIO-BASED MATERIAL:**

- A. Bio-based Materials: For products designated by the USDA's Bio-Preferred program, provide products that meet or exceed USDA recommendations for bio-based content, so long as products meet all performance requirements in this specification section. For more information regarding the product categories covered by the Bio-Preferred program, visit <http://www.bio-preferred.gov>

2.2 LUMBER

- A. Grading and Marking:
1. Lumber shall bear the grade mark, stamp, or other identifying marks indicating grades of material.
 2. Such identifying marks on a material shall be in accordance with the rule or standard under which the material is produced, including requirements for qualifications and authority of the inspection organization, usage of authorized identification, and information included in the identification.
 3. The inspection agency for lumber shall be approved by the Board of Review, American Lumber Standards Committee, to grade species used.
- B. Sizes:
1. Lumber Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which product is produced.
 2. Millwork and rails: Actual size as shown or specified.
- C. Hardwood: MM-L-736, species as specified for each item.
- D. Softwood: PS-20, exposed to view appearance grades:
1. Use C select or D select, vertical grain for transparent finish including stain transparent finish.
 2. Use Prime for painted or opaque finish.
- E. Use edge grain Wood members exposed to weather.

2.3 PLYWOOD

- A. Softwood Plywood:
1. Prod. Std.
 2. Grading and Marking:
 - a. Each sheet of plywood shall bear the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood.
 - b. The mark shall identify the plywood by species group or identification index, and shall show glue type, grade, and compliance with PS1.

3. Plywood, 13 mm (1/2 inch) and thicker; not less than five ply construction, except 32 mm (1-1/4 inch) thick plywood not less than seven ply.
 4. Plastic Laminate Plywood Cores:
 - a. Exterior Type, and species group.
 - b. Veneer Grade: A-C.
 5. Shelving Plywood:
 - a. Interior Type, any species group.
 - b. Veneer Grade: A-B or B-C.
 6. Other: As specified for item.
- B. Hardwood Plywood:
1. HPVA: HP.1.
 2. Species of face veneer shall be as shown or as specified in connection with each particular item.
 3. Inside of Building:
 - a. Use Type II (interior) A grade veneer for transparent finish.
 - b. Use Type II (interior) Sound Grade veneer for paint finish.

2.4 PARTICLEBOARD

- A. NPA A208.1
- B. Plastic Laminate Particleboard Cores:
 1. General Use: ANSI A208.1; Type 1, Grade 1-M-3, or Type 2, Grade 2-M-2, unless otherwise specified.
 2. Base and Wall Cabinets: ANSI A208.1; Type 1, Grade 1-M-3.

2.5 FIBERBOARD

- A. General: All composite wood products and agrifiber products shall be added urea-formaldehyde free.
- B. Medium Density Fiberboard: ANSI A208.2, medium density fiberboard, and meeting requirements of NPA - Specifier's Guide to Particleboard and MDF. Provide densities and thicknesses as required for application.

2.6 PLASTIC LAMINATE

- A. High Pressure Plastic Laminate: NEMA LD-3, high pressure plastic laminate.
- B. Exposed decorative surfaces including both sides of cabinet doors, and for items having plastic laminate finish. General Purpose, Type HGL, thickness as follows:
 1. Horizontal or High Usage Exposure: General purpose type, 1.3 mm (0.050 inch) thickness.
 2. Vertical or Medium Usage Exposure: General purpose type, 0.7 mm (0.028 inch) thickness.

- C. Cabinet Interiors including Shelving: Both of following options to comply with NEMA, CLS as a minimum.
 - 1. Plastic laminate clad medium density fiberboard or medium density particleboard.
- D. Balancing (Backing) Sheets: Type HGP, backing sheet, same thickness as laminate required for exposed faces.
- E. Post Forming Fabrication, Decorative Surfaces: Post forming, Type HGP, 1 mm (0.042 inch) thickness.
- F. Exposed Edges: Same type and thickness as laminate required for adjacent exposed faces, but not less than general purpose type, 1.3 mm (0.050 inch) thickness.

2.7 BUILDING BOARD (HARDBOARD)

- A. ANSI/AHA A135.4, 6 mm (1/4 inch) thick unless specified otherwise.
- B. Perforated hardboard (Pegboard): Type 1, Tempered perforated 6 mm (1/4 inch) diameter holes, on 25 mm (1 inch) centers each way, smooth surface one side.
- C. Wall paneling at gas chain rack: Type 1, tempered, Fire Retardant treated, smooth surface on side.

2.8 ADHESIVE

- A. For Plastic Laminate: Fed. Spec. A-A-1936.
- B. For Interior Millwork: Unextended urea resin, unextended melamine resin, phenol resin, or resorcinol resin.

2.9 STAINLESS STEEL

- A. General:
 - 1. Plate and Sheet: ASTM A167, Type 304.
 - 2. Shapes and Bars: ASTM A276, Type 304.

2.10 ALUMINUM CAST

- A. ASTM B26.

2.11 ALUMINUM EXTRUDED

- A. ASTM B221.

2.12 HARDWARE

- A. Rough Hardware:
 - 1. Furnish rough hardware with a standard plating, applied after punching, forming and assembly of parts; galvanized, cadmium plated, or zinc-coated by electric-galvanizing process. Galvanized where specified.
 - 2. Use galvanized coating on ferrous metal for exterior work unless non-ferrous metals or stainless is used.
 - 3. Fasteners:
 - a. Bolts with Nuts: FF-N-836.

- b. Expansion Bolts: A-A-1922A.
 - c. Screws: Fed. Spec. FF-S-111.
- B. Finish Hardware
1. Cabinet Hardware: ANSI A156.9.
 - a. Door/Drawer Pulls: B02011.b. Drawer Slides: B05051 for drawers over 150 mm (6 inches) deep, B05052 for drawers 75 mm to 150 mm 3 to 6 inches) deep, and B05053 for drawers less than 75 mm (3 inches) deep.
 - b. Adjustable Shelf Standards: B4061 with shelf rest B04083.
 - c. Concealed Hinges: B1601, minimum 110 degree opening.
 - d. Butt Hinges: B01361, for flush doors, B01381 for inset lipped doors, and B01521 for overlay doors.
 - e. Cabinet Door Catch: B0371 or B03172.
 - f. Vertical Slotted Shelf Standard: B04103 with shelf brackets B04113, sized for shelf depth.
 2. Cabinet Locks: ANSI A156.11.
 - a. Drawers and Hinged Door: E07262.
 - b. Sliding Door: E07162.
 3. Auxiliary Hardware: ANSI A156.16.
 - a. Shelf Bracket: B04041, japanned or enameled finish.
 - b. Combination Garment rod and Shelf Support: B04051 japanned or enamel finish.
 - c. Closet Bar: L03131 chrome finish of required length.
 - d. Handrail Brackets: L03081 or L03101.
 - 1) Cast Aluminum, satin polished finish.
 - 2) Cast Malleable Iron, japanned or enamel finish.
 4. Steel Channel Frame and Leg supports for Counter top. Fabricated under Section 05 50 00, METAL FABRICATIONS.
 5. Pipe Bench Supports:
 - a. Pipe: ASTM A53.
 6. Fabricated Wall Bench Supports:
 - a. Steel Angles: ASTM A36 steel with chrome finish, or ASTM A167, stainless steel with countersunk wood screws, holes at 64 mm (2-1/2 inches) on center on horizontal member.
 - b. Use 38 mm by 38 mm by 5 mm (1-1/2 by 1-1/2 by 3/16 inch) angle thick drilled for screw and bolt holes unless shown otherwise. Drill 6 mm (1/4 inch) holes for anchors on vertical member, not more than 200 mm (8 inches) on center between ends or corners.

- c. Stainless steel bars brackets: ASTM A167, fabricated to shapes shown, Number 4 finish. Use 50 mm by 5 mm (2 inch by 3/16 inch) bars unless shown otherwise. Drill for anchors and screws. Drill countersunk wood screw holes at 64 mm (2-1/2 inches) on center on horizontal members and not less than two 13 mm (1/4 inch) hole for anchors on vertical member.
- 7. Thru-Wall Counter Brackets:
 - a. Steel angles drilled for fasteners on 100 mm (4 inches) centers.
 - b. Baked enamel prime coat finish.
- 8. Edge Strips Moldings:
 - a. Driven type "T" shape with serrated retaining stem; vinyl plastic to match plastic laminate color, stainless steel, or 3 mm (1/8 inch) thick extruded aluminum.
 - b. Stainless steel or extruded aluminum channels.
 - c. Stainless steel, number 4 finish; aluminum, mechanical applied medium satin finish, clear anodized 0.1 mm (0.4 mils) thick.
- 9. Rubber or Vinyl molding
 - a. Rubber or vinyl standard stock and in longest lengths practicable.
 - b. Design for closures at joints with walls and adhesive anchorage.
 - c. Adhesive as recommended by molding manufacturer.
- 10. Primers: Manufacturer's standard primer for steel providing baked enamel finish.

2.13 MOISTURE CONTENT

- A. Moisture content of lumber and millwork at time of delivery to site.
 - 1. Interior finish lumber, trim, and millwork 32 mm (1-1/4 inches) or less in nominal thickness: 12 percent on 85 percent of the pieces and 15 percent on the remainder.
 - 2. Exterior treated or untreated finish lumber and trim 100 mm (4 inches) or less in nominal thickness: 15 percent.
 - 3. Moisture content of other materials shall be in accordance with the standards under which the products are produced.

2.14 FIRE RETARDANT TREATMENT

- A. Where wood members and plywood are specified to be fire retardant treated, the treatment shall be in accordance with Mil. Spec. MIL-L19140.
- B. Treatment and performance inspection shall be by an independent and qualified testing agency that establishes performance ratings.
- C. Each piece of treated material shall bear identification of the testing agency and shall indicate performance in accordance with such rating of flame spread and smoke developed.

- D. Treat wood for maximum flame spread of 25 and smoke developed of 25.
- E. Fire Resistant Softwood Plywood:
 - 1. Use Grade A, Exterior, plywood for treatment.
 - 2. Meet the following requirements when tested in accordance with ASTM E84.
 - a. Flame spread: 0 to 25.
 - b. Smoke developed: 100 maximum
- F. Fire Resistant Hardwood Plywood:
 - 1. Core: Fire retardant treated softwood plywood.
 - 2. Hardwood face and back veneers untreated,
 - 3. Factory seal panel edges, to prevent loss of fire retardant salts.

2.15 PRESERVATIVE TREATMENT

- A. Wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including wood members used for rough framing of millwork items except heart-wood Redwood and Western Red Cedar shall be preservative treated in accordance with AWPA Standards.
- B. Use Grade A, exterior plywood for treatment.

2.16 FABRICATION

- A. General:
 - 1. Except as otherwise specified, use AWI Custom Grade for architectural woodwork and interior millwork.
 - 2. Finish woodwork shall be free from pitch pockets.
 - 3. Except where special profiles are shown, trim shall be standard stock molding and members of the same species.
 - 4. Plywood shall be not less than 13 mm (1/2 inch), unless otherwise shown or specified.
 - 5. Edges of members in contact with concrete or masonry shall have a square corner caulking rebate.
 - 6. Fabricate members less than 4 m (14 feet) in length from one piece of lumber, back channeled and molded as shown.
 - 7. Interior trim and items of millwork to be painted may be fabricated from jointed, built-up, or laminated members, unless otherwise shown on drawings or specified.
 - 8. Pre-Cut Openings: Fabricate architectural woodwork with pre-cut openings, to receive hardware, equipment, fixtures, electrical work and similar items. Locate openings accurately and use templates or roughing-in diagrams for proper size and shape. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges of cutouts with water resistant coating.

9. Plastic Laminate Work:

- a. Factory glued to either a medium density fiberboard or medium density particleboard core, thickness as shown or specified.
- b. Cover exposed edges with plastic laminate, except where aluminum, stainless steel, or plastic molded edge strips are shown or specified. Use plastic molded edge strips on 19 mm (3/4-inch) molded thick or thinner core material.
- c. Provide balancing (backing) sheets for 100 percent of back, or concealed faces or surfaces of plastic laminate covered surfaces or members, on underside of countertops, including back splashes and end splashes of countertops, without exception.
- d. Use balancing (backing) sheet on concealed large panel surface when decorative face does not occur.

B. Benches:

1. Fabricate from 50 mm (2 inch) stock strips of plain-sawed White Oak, or Maple.
2. Solid seats securely glued together of spliced, doweled, or double tongued and grooved wood pieces. Where open joints are indicated, work each wood piece from solid stock.
3. Round top edges and corners where exposed.

C. Wood handrails:

1. Fabricate from Maple or Birch.
2. AWI Premium Grade.
3. Fabricate in one piece and one length when practical.
4. Fabricate curved sections for ends of rails to return to wall and where rails change slope or direction.
5. Joints are permitted only where rail changes direction or slope, or where necessary for field erection or shipping.
6. Scarf or dowel all joints to provide a smooth and rigid connection. Glue all joints.
7. Fit joints, to produce a hair-line crack.
8. Completely shop fabricated in accordance with approved shop drawings.

2.17 FINISHING

- A. General: Entire finish of architectural woodwork is work of this Section, regardless of whether shop applied or applied after installation.
- B. Standard: Meet requirements of AWI - Quality Standards, Section 1500, as applicable to each item of architectural woodwork and respective quality grade required.

- C. Shop Finishing: To greatest extent possible, finish architectural woodwork at shop or factory. Defer final touch-up, cleaning and polishing after delivery and installation.
- D. Preparations: Sand, fill countersunk fasteners, back prime and perform similar preparations for finishing of architectural woodwork, as applicable to each unit of work and quality grade of woodwork required.
- E. Opaque Paint Finish - Close Grained Wood:
 - 1. Standard: AWI Finish System OP-6 - Opaque Catalyzed Polyurethane, Custom Grade, close grained wood finish. Finish shall be capable of being touched up and repaired at project site without repair being noticeable as acceptable to Architect.
 - 2. Color and Sheen: Finish color and sheen shall be as selected by Architect from standard color and finish sheen range of finish manufacturer. Unless otherwise selected by Architect, provide uniform 40 satin sheen, 30 to 50 degree sheen on 60 degree Gloss Meter.

2.18 WOODWORK ITEMS

- A. Architectural Cabinets - High Pressure Plastic Laminate:
 - 1. Description: Architectural cabinets with high pressure laminate, includes base and wall cabinets, and associated components, including but not limited to metal components, cabinet hardware glass and appurtenances.
 - 2. Standard and Grade: AWI Quality Standards, Section 400 and Section 400B - Laminate Cabinets, Custom Grade.
 - 3. Type Construction: Flush overlay.
 - 4. Exposed and Semi-Exposed Surfaces:
 - a. Plastic Laminate: High pressure plastic laminate, color throughout, as specified in this Section for high usage exposure and with eased exterior corner edges. Not for chemical and heat resistance usage.
 - b. Balancing (Backing) Sheet: As specified in this Section for 100 percent of back or concealed surfaces.
 - 5. Edge Treatment: High pressure plastic laminate banded, same as specified in this Paragraph for exposed surfaces, with eased exterior corner edges.
 - 6. Core: Medium density fiberboard or medium density particleboard, 19 mm (3/4 inch) minimum thickness.
 - 7. Dust Panels: Provide dust panels of 6 mm (1/4 inch) plywood or tempered hardboard above compartments and drawers, except where located directly under tops.

8. Hardware: Components as required and meeting applicable hardware requirements specified in this Section.
- B. Architectural Countertops - Solid Surfacing:
1. Description: Architectural countertops, and sills and like components associated with architectural woodwork fabricated of solid polymer plastic, and including hardware components and meeting requirements of Section 12 36 00, COUNTERTOPS.
 2. Standard and Grade: Custom Grade
 3. Hardware: Components as required and meeting applicable requirements specified in this Section.

PART 3 - EXECUTION

3.1 ENVIRONMENTAL REQUIREMENTS

- A. Maintain work areas and storage areas to a minimum temperature of 21⁰C (70⁰F) for not less than 10 days before and during installation of interior millwork.
- B. Do not install finish lumber or millwork in any room or space where wet process systems such as concrete, masonry, or plaster work is not complete and dry.

3.2 INSTALLATION

- A. General:
 1. Millwork receiving transparent finish shall be primed and back-painted on concealed surfaces. Set no millwork until primed and back-painted.
 2. Secure trim with fine finishing nails, screws, or glue as required.
 3. Set nails for putty stopping. Use washers under bolt heads where no other bearing plate occurs.
 4. Seal cut edges of preservative and fire retardant treated wood materials with a certified acceptable sealer.
 5. Coordinate with plumbing and electrical work for installation of fixtures and service connections in millwork items.
 6. Plumb and level items unless shown otherwise.
 7. Nail finish at each blocking, lookout, or other nailer and intermediate points; toggle or expansion bolt in place where nails are not suitable.

8. Anchor woodwork to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailings, countersunk and filed flush with woodwork, and matching final finish where transparent finish is required.
- B. Trim: Install with minimum number of joints using full-length pieces for each run of application to greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, and meet AWI Quality Standards for joinery.
- C. Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as required.
- D. Benches:
 1. Use stainless steel countersunk screws to secure wood seats to brackets, angle, or pipe supports.
 2. Use stainless steel or chrome plated steel bolts for anchorage to walls. Use 6 mm (1/4 inch) toggle bolts in steel stud walls and hollow masonry. Use 6 mm (1/4 inch) expansion bolts in solid masonry or concrete.
 3. Wall Benches: Support within 150 mm (6 inches) near ends and not over 900 mm (3 feet) on centers with stainless steel bar brackets under bench secured to seat and wall.
- E. Wood Handrails:
 1. Install in one piece and one length when practical.
 2. Where rails change slope or direction, install special curved sections and ends of rails to return to wall, glue all field joints.
 3. Install brackets within 300 mm (12 inches) of ends of handrails and at every spaced intervals between not exceeding 1500 mm (5 feet) on centers at intervals between as shown. Anchor brackets as detailed and rails to brackets with screws.
- F. Install with butt joints in straight runs and miter at corners.

3.3 ADJUSTING CLEANING

- A. Adjusting: Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Cleaning:

1. General: Clean woodwork on exposed and semi-exposed surfaces. Touch-up finishes to restore damaged or soiled areas.
2. Hardware: Clean hardware, lubricate and make final adjustments for proper operation.

C. Protection:

1. General: Protect architectural woodwork and maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.
2. Protective Cleaning: Cover completed work with protective covering, applied in a manner which will allow easy removal and without damage to woodwork or adjoining work. Remove cover immediately before the time of final acceptance.

3.4 FINISH CARPENTRY SCHEDULE

A. Plastic Laminate, Base Cabinets:

1. Plastic Laminate, PL-1:
 - a. Manufacturer: Wilsonart International; Div. of Premark Internatinal, Inc.
 - b. Product: Chemsurf.
 - c. Color: Shadow D96, Matte Finish.
2. Plastic Laminate, HPDL-2:
 - a. Manufacturer: Lamin-Art, Inc.
 - b. Product: Pearlescence.
 - c. Color: 2404 Copper T, Textured Finish.

B. Plastic Laminate, Ceiling Soffit:

1. Plastic Laminate, ACT-3:
 - a. Manufacturer: Lamin-Art, Inc.
 - b. Product: Veneer Art 983-WG.
 - c. Color: Golden Oak.

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Edward Hines, Jr. VA Hospital
Building 228: Mental Health Renovation
Hines, Illinois

SECTION 06 42 23
DECORATIVE WALL PANELS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Decorative wood panels.

B. Related Requirements:

1. Section 061000 "Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing paneling and that are concealed within other construction before panel installation.
2. Section 099100 "Painting."

1.02 SUBMITTALS

A. Product Data: For each type of product, including panel products. and fire-retardant-treated materials.

1. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Shop Drawings: Show location of paneling, large-scale details, attachment devices, and other components. Include dimensioned plans and elevations.

1. Show details full size.
2. Show locations and sizes of furring and blocking, including concealed blocking specified in other Sections.

C. Samples for verification for decorative wall panels, 8 by 10 inches , for each type, color, pattern, and surface finish. .

D. Qualification Data: For Installer .

E. Product Certificates: For each type of product.

F. Evaluation Reports: For fire-retardant-treated materials from ICC-ES.

1.03 QUALITY ASSURANCE

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver paneling until painting and similar operations that could damage paneling have been completed in installation areas. If paneling must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.05 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install paneling until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install paneling until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- C. Field Measurements: Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support paneling by field measurements before being enclosed and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where paneling is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.06 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.

PART 2 - PRODUCTS

2.01 DECORATIVE WALLPANELS

- A. Decorative, Concealed-Fastener Composite Wood Wall Panels:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Richelieu; FormArt Collection RIC39UW or comparable product by one of the following:
 - a. Architectural Systems, Inc.
 - b. Soelberg Industries.
 - c. 3D Paneling.
 - 2. Backs: Manufacturer's standard white melamine resin coating.
 - a. Finish: Field-applied paint.
 - 3. Panel Size: 96 inches wide by 48 inches high.
 - 4. Pattern: Curvilinear waves.
- B. Panel Core: Fire-retardant particleboard or fire-retardant, medium-density fiberboard.
 - 1. Thickness: 1 inch.
- C. Fire-Retardant-Treated Paneling: Panels shall consist of fire-retardant plastic laminate and fire-retardant particleboard or fire-retardant, medium-density fiberboard. Panels shall have a flame-spread index of [25] [75] or less and a smoke-developed index of 450 or less per ASTM E 84 and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.

2.02 MATERIALS

- A. Wood Moisture Content: 8 to 13 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
 - 1. Medium-Density Fiberboard: ANSI A208.2, Grade 130 , made with binder containing no urea formaldehyde.
- C. Adhesives: Do not use adhesives that contain urea formaldehyde.

2.03 FIRE-RETARDANT-TREATED MATERIALS

- A. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
 - 1. Use treated materials that comply with requirements of referenced woodworking standard. Do not use materials that are warped, discolored, or otherwise defective.
 - 2. Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.
 - 3. Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.
- B. Fire-Retardant Fiberboard: Medium-density fiberboard panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E 84.

2.04 INSTALLATION MATERIALS

- A. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Before installation, condition paneling to average prevailing humidity conditions in installation areas.
- B. Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.02 INSTALLATION

- A. Install paneling level, plumb, true, and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches. Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.
- B. Anchor paneling to supporting substrate with concealed panel-hanger clips . Do not use face fastening unless otherwise indicated.

3.03 ADJUSTING AND CLEANING

- A. Repair damaged and defective paneling, where possible, to eliminate defects; where not possible to repair, replace paneling. Adjust for uniform appearance.
- B. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

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