SECTION 061000 - CARPENTRY

1. GENERAL
   * + 1. RELATED DOCUMENTS
          1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
       2. SUMMARY
          1. Section Includes:

Framing with dimension lumber.

Framing with timber.

Framing with engineered wood products.

Solid wood floor or roof decking.

Rooftop equipment bases and support curbs.

Wood blocking and nailers.

Blocking and bracing for anchorage of cabinets, toilet accessories, fixtures, door stops, miscellaneous equipment, and any other roof-, floor-, ceiling-, or wall-mounted items.

Wood furring and grounds.

Wood sleepers.

Plywood.

Roof and wall sheathing

Plywood backing panels.

Plywood at temporary walls.

Exposed-to-view plywood wainscots and wall cladding.

Plywood wainscoting in communications equipment rooms.

Non-structural plywood wall sheathing.

Plywood flooring as decking/walking surface at interior equipment platforms, catwalks, mezzanines, penthouses, including attic access walkways.

Plywood sheathing over rigid insulation as backing for exterior wall cladding or finishes. Refer to Section 072100 for insulation.

Medium Density Overlay (MDO) wainscots and wall cladding.

Plywood floor underlayment.

Medium Density Fiberboard (MDF) wainscots and wall cladding.

Wood Fiber Acoustical Panels (WFAP) or Tectum.

Perforated Hardboard (pegboard or PB).

Cement Fiber Board (CFB) wainscots and wall cladding.

Other miscellaneous carpentry not included in Section 064000, Architectural Woodwork.

* + - * 1. Related Requirements:

Section 061800 “Glued-Laminated Construction”.

* + - 1. DEFINITIONS
         1. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
         2. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
         3. Exposed Framing: Framing not concealed by other construction.
         4. OSB: Oriented strand board.
         5. Timber: Lumber of 5 inches nominal size or greater in least dimension.
      2. PERFORMANCE REQUIREMENTS
         1. Sustainability: Conform to Section 018113 WSSP requirements for use of regional materials, recycled content, low-emitting materials and waste management. (Certified Wood)
      3. SUBMITTALS
         1. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

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 and net amount of preservative retained.

Include treatment manufacturer’s instructions for handling, storing, installing, and finishing treated material.

Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.

For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.

For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

* + - * 1. Fastener Patterns: Full-size templates for fasteners in exposed framing.
        2. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
        3. Evaluation Reports: For the following, from ICC-ES:

Wood-preservative-treated wood.

Fire-retardant-treated wood.

Engineered wood products.

Shear panels.

Power-driven fasteners.

Post-installed anchors.

Metal framing anchors.

* + - 1. DELIVERY, STORAGE, AND HANDLING
         1. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.
      2. ALTERNATE BIDS

1. PRODUCTS
   * + 1. WOOD PRODUCTS, GENERAL
          1. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

Factory mark each piece of lumber with grade stamp of grading agency.

For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.

Dress lumber, S4S, unless otherwise indicated.

Nominal dimensions are indicated, unless shown otherwise with detail dimensions.

Maximum Moisture Content of Lumber: 19 percent, unless otherwise indicated.

* + - * 1. Timber Framing: Comply with DOC PS 20 and with grading rules of lumber-grading agencies certified by ALSC's Board of Review as applicable.

Factory mark each item of timber with grade stamp of grading agency.

For exposed timber indicated to receive a stained or natural finish, omit grade stamps and provide certificates of grade compliance issued by grading agency.

Structural Properties: Provide any species and grade that, for moisture content provided, complies with required structural properties.

Dress lumber, S4S, unless otherwise indicated to be rough sawn.

Maximum Moisture Content: 19 percent maximum moisture content at time of dressing or provide timber that is unseasoned at time of dressing but with 19 percent maximum moisture content at time of installation.

* + - * 1. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

* + - 1. WOOD-PRESERVATIVE-TREATED LUMBER
         1. Preservative Treatment: Treat all carpentry in the following conditions with preservative:

Where wood joists or the bottom of a wood structural floor without joists are closer than 18 inches, or wood girders are closer than 12 inches to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation, all floor construction (including posts, girders, joists and subfloor).

Wood framing members, including wood sheathing, that rest on exterior foundation walls and are less than 8 inches from exposed earth.

Wood framing members and furring strips attached directly to the interior of exterior masonry or concrete walls below grade.

Sleepers and sills on a concrete or masonry slab that is in direct contact with earth.

Wood girders entering exterior masonry or concrete walls, if not provided with a 1/2-inch air space on top, sides and end.

Wood siding less than 6 inches vertical from earth on the exterior of a building or less than 2 inches vertical from concrete steps, porch slabs, patio slabs and similar horizontal surfaces exposed to the weather.

Posts or columns supporting permanent structures and supported by a concrete or masonry slab or footing that is in direct contact with the earth.

All conditions related to roof construction, including curbs, nailers, parapets, and similar conditions.

* + - * 1. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground .

Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

* + - * 1. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
        2. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.

* + - 1. FIRE-RETARDANT-TREATED MATERIALS
         1. Treat all wood concealed within wall, floor, and ceiling construction with fire retardant, with the exception of:

Blocking such as for handrails, millwork, cabinets, and window and door frames.

Concealed nailing or furring strips between wall construction and applied interior finish material, where the strips do not exceed 1-3/4 inches in thickness and are applied directly against the wall substrate.

Heavy timber meeting or exceeding the member sizes in 2012 IBC Table 602.4, at locations specifically permitted in 2012 IBC Section 603.1.3, Exception 19.

Interior finish materials classified by ASTM E84 or UL 723 as Class A wall and ceiling finishes; Flame spread index 0-25; smoke-developed index 0-450.

Floor finish and floor covering materials, including blocking and subflooring associated with hardwood floor systems, provided that the sleepers or nailers are fireblocked at spacing not to exceed 100 square feet in area, and open spaces do not extend beneath permanent partitions or walls.

Exception: Fireblocking is not required at wood floor systems over slab-on-grade in gymnasiums, exercise rooms, and similar athletic functions.

* + - * 1. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

Treatment shall not promote corrosion of metal fasteners.

Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.

Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.

* + - * 1. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.
        2. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
        3. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.

For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.

* + - * 1. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.
      1. DIMENSION LUMBER FRAMING
         1. See Structural General Notes on the drawings.
         2. Species:

Douglas fir-larch; WCLIB or WWPA.

* + - * 1. Exposed Framing Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.
      1. TIMBER FRAMING
         1. See Structural General Notes on the drawings.
         2. Species:

Douglas fir-larch; WCLIB or WWPA.

* + - * 1. Exposed Timbers Indicated to Receive a Stained or Natural Finish: Hand-select material for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

Additional Restriction: Free of heart centers.

* + - 1. ENGINEERED WOOD PRODUCTS
         1. See Structural General Notes on the drawings.
         2. Basis of Design: RedBuilt,
         3. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.
         4. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.
         5. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.
         6. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D5055. Exterior grade/

Comply with APA PRI-400. Factory mark I-joists with APA-EWS trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA-EWS standard.

* + - * 1. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research or evaluation report for I-joists.

Manufacturer: Provide products by same manufacturer as I-joists.

Material: Product made from any combination solid lumber, wood strands, and veneers.

Comply with APA PRR-401, rim board grade. Factory mark rim boards with APA-EWS trademark indicating thickness, grade, and compliance with APA-EWS standard.

* + - 1. MISCELLANEOUS LUMBER
         1. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

Blocking.

Nailers.

Rooftop equipment bases and support curbs.

Cants.

Furring.

Grounds.

* + - * 1. Dimension Lumber Items: Standard, Stud, or No. 3 grade lumber of the same species as dimension lumber framing.
        2. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
        3. For furring strips behind or under plywood, OSB, MDF, MDO, or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.
      1. SOLID WOOD FLOOR OR ROOF DECKING
         1. See Structural General Notes on the drawings.
         2. Conform to general requirements and grading rules for lumber, and comply with AF&PA's WCD 2, "Tongue and Groove Roof Decking," or with AITC 112, unless otherwise indicated.
      2. PLYWOOD
         1. Sheathing and Backing Panels

See Structural General Notes on the drawings.

Plywood, DOC PS 1, Exterior, Grade AC in thickness indicated. If not indicated, not less than 7/16 inch actual thickness.

* + - * 1. Plywood Wainscot in Communications Equipment Rooms: Plywood, DOC PS 1, Exterior, Grade AC, ¾ inch thick unless indicated otherwise.
        2. Medium Density Overlay (MDO) Plywood: Medium Density Overlay plywood, DOC PS 1, Exterior, with one face of MDO, B-grade face and back veneer, and C-grade inner plies. 3/4-Inch thick unless indicated otherwise.

Provide MDO plywood wherever plywood is shown to be a finished wall surface material except in communications equipment rooms.

Exception: Plywood wainscot as specified above is acceptable and mechanical or electrical rooms, or other similar utilitarian rooms (such as janitor, storage, etc.), but not in spaces intended for occupancy.

* + - * 1. Plywood Floor Underlayment: Underlayment Grade Plywood, DOC PS-1, Exterior, 5-ply minimum, ¼ inch thick unless indicated otherwise. Provide Fully Sanded Face under resilient flooring, Sanded Face for all other floor finishes.
        2. For Products Not Manufactured Under DOC PS 1: DOC PS 2, Exposure 1.
        3. Factory-mark each panel with APA trademark evidencing compliance with grade requirements.
      1. PLYWOOD SHEATHING OVER RIGID INSULATION
         1. Plywood: 1/2 inch thick unless indicated otherwise, conforming to requirements specified herein for plywood sheathing and backing panels.
         2. Fasteners: Self-tapping or wood screws as appropriate for type of studs, of sufficient length to penetrate at least 3/4 inch through flange of metal stud, or 1-1/2 inches into wood stud.
         3. Metal Strapping: Conforming to Section 055000; flat galvanized steel strapping, 16 gage x 2 inches wide in long continuous rolls.
      2. MEDIUM DENSITY FIBERBOARD (MDF) WAINSCOTS AND WALL CLADDING
         1. Medium Density Fiberboard (MDF): Industrial Grade Medium Density Fiberboard manufactured with a formaldehyde-free adhesive system and which meets the physical properties of ANSI A208.2-2009 Grade 130 Specifications, 5/8” thick unless indicated otherwise.
      3. WOOD FIBER ACOUSTICAL PANELS (WFAP) OR TECTUM
         1. Wood Fiber Acoustical Panels (WFAP) or Tectum: Tectum Interior Wall Panels, 2” thickness or as shown on drawings; all edges beveled; width and length as shown on Drawings; actual factory-finished uncut width 1/4 inch less than nominal width.
      4. PERFORATED HARDBOARD (PEGBOARD OR PB)
         1. 1/4 inch thick tempered hardboard, high strength, pre-finished white, with pre-drilled perforations at 1” on center each way in square pattern, suitable for standard hanging hooks and accessories to be provided by owner. Include wood furring ¾ inch thick x 1-1/2 inch wide.
      5. CEMENT FIBERBOARD (CFB) WAINSCOTS AND WALL CLADDING
         1. Cement Fiberboard: Hardie Panel by James Hardie, Smooth texture, 5/16 inch thickness, 4 foot wide x length as required for installation without horizontal joints up to 10 feet in total height.
      6. FASTENERS
         1. See Structural General Notes on the drawings.
         2. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153, or Type 304 stainless steel.

* + - * 1. Nails, Brads, and Staples: ASTM F1667.
        2. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
        3. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193, or ICC-ES AC308 as appropriate for the substrate.

Material, Interior Exposure: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.

Material, Exterior Exposure: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.

* + - * 1. Fasteners for Wainscots, Wall Cladding, and Surfaces Finished with MDO, Plywood, or MDF: Galvanized countersunk-head screws, in combination with construction adhesive.
        2. Fasteners for Cement Fiberboard (CFB): Galvanized countersunk-head screws, in combination with construction adhesive.
      1. METAL FRAMING ANCHORS
         1. See Structural General Notes on the drawings.
         2. Allowable design loads, as published by manufacturer, shall meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
      2. MISCELLANEOUS MATERIALS
         1. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
         2. Flexible Flashing (To Separate Preservative-Treated Wood from Metal Decking): Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
         3. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D3498 that is approved for use indicated by adhesive manufacturer.
         4. Construction Adhesives for Gluing Wainscot and Wall Cladding to Substrates: ASTM C557, non-staining, water-resistant, and approved for use indicated by adhesive manufacturer.
         5. Metal Corner Trim for Wainscot and Wall Cladding: Clear aluminum anodized unless indicated otherwise. Countersink screw holes unless indicated otherwise.

Angle, Plate, and Similar Extruded Shapes: Conform to requirements for trim in Section 064100. Profiles and sizes as indicated in drawings.

Corner Molding: “X” Corner Molding by Fry Reglet Corporation, sized to accommodate thickness of adjoining wainscot or wall cladding material and completely conceal edges without additional gap.

* + - * 1. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chloropyrifos as its active ingredient.

1. EXECUTION
   * + 1. INSTALLATION, GENERAL
          1. See Structural General Notes on the drawings.
          2. Make provisions for erection loads and temporary construction loads, for sufficient temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
          3. Do not allow notches or holes to be cut in members unless detailed in the drawings. For engineered wood products, conform to manufacturer’s instructions for cutting notches or holes into members of each type or use.
          4. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
          5. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
          6. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
          7. Install plywood sheathing and backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
          8. Install shear wall panels to comply with manufacturer's written instructions.
          9. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
          10. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
          11. Do not splice structural members between supports unless otherwise indicated.
          12. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches on center.

* + - * 1. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities of structure framed with dimension lumber, timber, and/or engineered wood products as indicated and as follows:

Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches on center with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches on center. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.

Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 square feet and to solidly fill space below partitions.

Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet on center.

* + - * 1. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
        2. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

Use inorganic boron for items that are continuously protected from liquid water.

Use copper naphthenate for items not continuously protected from liquid water.

* + - * 1. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
        2. Fit carpentry work to other work; scribe and cope as required for accurate fit. Coordinate location of furring, nailers, blocking, and similar supports as required for attachment of subsequent work.
        3. Refinish or touch-up any surfaces cut after finishing or treatment, with products recommended by original finish or treatment applicator for field conditions.
        4. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

"Fastening Schedule” Table in the applicable building code referenced in the drawings.

ICC-ES evaluation report for fastener.

* + - * 1. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; pre-drill if required. Drive nails snug but do not countersink nail heads unless otherwise indicated.
        2. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

Comply with approved or indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.

Use finishing nails unless otherwise indicated or prohibited for the condition. Countersink nail heads and fill holes with wood filler.

* + - 1. WOOD BLOCKING AND NAILER INSTALLATION
         1. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
         2. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
      2. WOOD FURRING INSTALLATION
         1. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
      3. STRUCTURAL WALL AND PARTITION FRAMING INSTALLATION
         1. General: Refer to drawings.
      4. NON-STRUCTURAL, NON-BEARING WALL AND PARTITION FRAMING INSTALLATION
         1. General: Any framing indicated in architectural drawings and not in structural drawings is non-structural, non-bearing.
         2. Provide single bottom plate and double top plates using members of 2-inch nominal thickness whose widths equal that of studs. Fasten plates to supporting construction unless otherwise indicated.

Attach bottom plate to concrete slab-on-grade with powder-actuated anchor at 24 inches on center for walls up to 13’-4” in height, and 16 inches on center for walls over 13’-4” in height; Hilti X-U 0.157” diameter embedded ¾” minimum in the slab, or approved equal.

* + - * 1. Locate studs at 16 inches on center typical, unless indicated otherwise.
        2. Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.
        3. Construct corners and intersections with three or more studs for support and attachment of wall sheathing at all edges.
        4. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
        5. Provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, and 6-inch nominal depth for openings 48 to 72 inches in width.
        6. Provide triple-jamb studs and headers not less than 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.
        7. Provide diagonal bracing in at both walls of each external corner if studs are not fully sheathed on at least one side with minimum 1/2 inch thick gypsum drywall or plywood. Install bracing at 15- to 70-degree angle from horizontal (45-degree wherever possible), full-height from bottom plate to top plate unless otherwise indicated. Use 1-by-4-inch nominal-boards or T-strap galvanized metal wall bracing, let-in to studs and plates.
      1. FLOOR JOIST FRAMING INSTALLATION
         1. General: Refer to drawings.
      2. CEILING JOIST AND RAFTER FRAMING INSTALLATION
         1. General: Refer to drawings for structural framing.
         2. Any framing indicated in architectural drawings and not in structural drawings is non-structural and not a part of any lateral diaphragm system.
         3. Non-Structural Ceiling Joists:

Install with crown edge up and support ends of each joist as follows:

Where supported by wood members, by toe nailing or metal framing anchors.

Where framed into wood supporting members, by using wood ledgers as indicated or, if not indicated, by using metal joist hangers.

Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal-size or 2-by-4-inch nominal-size stringers spaced 48 inches on center crosswise over main ceiling joists.

Provide ceiling joist framing for eaves, overhangs, and similar conditions.

* + - 1. TIMBER FRAMING INSTALLATION
         1. General: Refer to drawings.
      2. STAIR FRAMING INSTALLATION
         1. General: Refer to drawings.
      3. SOLID WOOD FLOOR OR ROOF DECKING
         1. General: Refer to drawings.
         2. Comply with AF&PA's WCD 2, "Tongue and Groove Roof Decking," unless otherwise indicated.
      4. PLYWOOD
         1. General: Refer to drawings.
         2. Any plywood indicated in architectural drawings and not in structural drawings is non-structural.
         3. Non-Structural Plywood Wall Sheathing, and Plywood at Temporary Walls:

Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

Nail to wood framing.

Screw to cold-formed metal framing.

Space panels 1/8 inch apart at edges and ends.

* + - * 1. Plywood Subfloor or Decking:

This section is applicable only where decking/walking surface at interior equipment platforms, catwalks, mezzanines, penthouses, and attic access walkways is not shown in structural drawings.

General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

Fasten panels as indicated below:

Glue and nail to wood framing.

Screw to cold-formed metal framing.

Space panels 1/8 inch (3 mm) apart at edges and ends.

If a resilient floor finish material is indicated to be installed, fill and sand edge joints immediately before installing flooring.

* + - * 1. Plywood Floor Underlayment:

Comply with applicable recommendations in APA Form No. L335N, “Selection, Installation, and Preparation of Plywood Underlayment,” for the type(s) of finish flooring to be installed over the underlayment.

Conform to panel manufacturer recommendations for fastener type and installation.

Fill and sand gaps, seams, and edges unless specifically recommended without filler by the finish flooring manufacturer.

* + - 1. EXPOSED-TO-VIEW PLYWOOD, MDF, AND MDO WAINSCOTS AND WALL CLADDING
         1. Lay out according to wall elevations or details, using sheet sizes as required to avoid additional joints not indicated.
         2. Bevel all edges to profile indicated in drawings, or 1/8 inch deep x 1/8 inch wide if not indicated. Rout out special reveals and edges as indicated. Where fewer panels can yield the desired joint pattern, it is acceptable to rout out intermediate joints to replicate the appearance of separate panels using a single panel.
         3. Abut edges and ends tight.
         4. Block-up or shim up ¼” from floor surface so that transient moisture from mopping or spills does not wick up wood paneling.
         5. Glue and screw panels to substrates, and to studs wherever possible. Locate screws at not less than 16 inches on center for vertical and horizontal edges, and 16 inches on center vertically in the field of all panels. Provide sufficient screws to hold panels in place until adhesive achieves initial cure.
         6. Countersink screws, fill screw heads flush, and prepare filled holes for finish painting under Section 099123 “Interior Painting”.
      2. PLYWOOD SHEATHING OVER RIGID INSULATION
         1. Install rigid insulation over exterior side of stud walls, in accordance with Section 072100. Over this continuous substrate, provide plywood, metal strapping, and fasteners as a complete sheathing assembly to be covered with weather barrier under Section 072500, and exterior metal panel or other cladding systems.
         2. Support the sheathing assembly at the bottom of each wall and at headers on wood ledgers, steel angle, concrete deck, structural framing, or similar member to transfer the gravity load of the sheathing assembly to the foundation or slab at each floor line.

If no other support is indicated, provide 2x4 wood ledger with continuous 1/2 inch plywood shim attached to structure.

* + - * 1. Locate a continuous row of metal strapping at the top and bottom of walls. Space intermediate rows of metal strapping as recommended for attachment of the exterior metal panel or other cladding system to the strapping. If vertical support spacing is not indicated, locate rows of strapping at each horizontal joint in plywood, centered vertically on the joint, at 48 inches on center maximum.
        2. Install fasteners through strapping, plywood, and insulation to studs at not less than 8 inches on center for vertical and horizontal edges, and 12 inches on center vertically in the field of all panels. Verify attachment of each fastener to stud except every other horizontal edge fastener will occur between studs and only attach strapping to plywood and insulation.
        3. Produce final assembly that is level, plumb, true to wall plane and without offsets that will adversely affect subsequent installation of metal panel or other cladding systems.
      1. WOOD FIBER ACOUSTICAL PANELS (WFAP) OR TECTUM
         1. Cut panels to sizes indicated on drawings. Bevel all edges to profile indicated in drawings.
         2. Fasten to walls, ceilings, and other substrates using a combination of construction adhesive and fasteners recommended by the panel manufacturer.
         3. Select fasteners which will be concealed or visually disguised in texture of wall panel and not visually apparent from a distance of 5 feet.
         4. Unless indicated otherwise, conceal all fasteners by countersinking heads flush or slightly below the panel surface.
      2. PERFORATED HARDBOARD (PEGBOARD OR PB)
         1. Layout and cut hardboard to avoid perforations. Ease all edges of hardboard to a smooth, rounded surface.
         2. Install wood furring behind pegboard, vertically at 32 inches on center and around full perimeter. Fasten pegboard through furring with a combination of construction adhesive and finish nails.
      3. CEMENT FIBERBOARD (CFB) WAINSCOTS AND WALL CLADDING
         1. Cut panels to sizes indicated on drawings. Unless separate trim is indicated, ease all edges of cement fiberboard to a smooth, beveled surface.
         2. Fasten to walls, ceilings, and other substrates using a combination of construction adhesive and fasteners recommended by the panel manufacturer. Conform to manufacturer’s recommendations for locations and spacing of fasteners. Predrill fastener holes slightly oversized to relieve stresses from thermal or humidity cycling.
      4. PROTECTION
         1. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
         2. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes [wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000