DIVISION 06 - Wood, Plastics, and Composites

Preface

The Texas Tech University System's '*Design and Construction Standards'*, as administrated by Facilities Planning and Construction, are intended to serve as guidelines to the Design Professional and Construction Management teams for design development and construction administration of Texas Tech University System (TTUS) Capital Projects. They communicate the minimum expectations and requirements relative to specific building systems, design provisions, general specification requirements, and administrative procedures for new facilities being constructed on Texas Tech University System (ASU, MSU, TTU, TTUHSC, and TTUHSC El Paso) campuses. Several, but not all requirements for each component Institution or Agency within the TTU System are covered. Design Professionals, Construction Managers at Risk and/or Design-Build Firms shall also refer to provisions covered in their service Agreements, as well as within the project's Basis of Design (BOD) document.

In addition, the 'Design and Construction Standards' shall also be utilized in conjunction with the approved project specific Program and Schematic Design development. In the event of conflict between this document and specific project requirements, Design Professionals, Construction Managers at Risk and/or Design-Build Firms shall contact Facilities Planning & Construction for clarification.

The guidelines within the '*Design and Construction Standards'* are not intended to prohibit the use of alternative design solutions, methods, systems, products or devices not covered in this document. Offered alternatives deviating from or not covered in these standards shall be documented by the Design Professional and/or Construction Management teams and submitted to Facilities Planning & Construction for approval prior to implementation.

Throughout the '*Design and Construction Standards'* there are references to manufacturer specific products. These are to be considered the 'Basis of Design' to establish the expected

minimum quality requirements. Design Professionals are encouraged to identify and include equivalent products and/or manufacturers offering comparable products to facilitate open bidding environments.

General Requirements for Wood, Plastics and Composites

The Design Professional will specify wood types and species unless otherwise indicated herein.

All wood concealed in walls, ceilings or roof construction shall be FM approved fire retardant treated. All materials shall bear identification showing the fire performance rating thereof. Such identifications shall be issued by an approved agency having a service for inspection of materials at the factory.

Refer to FM Global Property Loss Prevention Data Sheet 1-61 “Fire-Retardant Treated Wood”. Use fire-retardant treated wood that has been kiln dried after treatment to limit the maximum moisture content to 19% for lumber and 15% for plywood.

Use FM Approved materials where available. See www.roofnav.com for FM Approved materials.

Exposed wood for paint or transparent finish shall not be fire retardant treated.

Treated wood, including lumber and plywood, shown or scheduled as "Exterior Treated" or specified herein to be treated, to comply with the applicable requirements of the American Wood Preservers Institute (AWPI), and in accordance with the latest UBC Standard. Preservative treatment to be by Pressure Process complying with AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.

Preservative chemicals must be acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

1. Kiln-dry lumber after treatment to a maximum moisture content of 19% for lumber and 15% for plywood. 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.
3. Treat items indicated on Drawings, and the following:
    a. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
    b. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
    c. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative treated lumber.

Materials and fabrication shall conform to Architectural Woodwork Institute ‘Quality” standards. Specify to submit for each type of process and factory-fabricated product and indicate component materials and dimensions and include construction and application details.

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 and net amount of preservative retained.
2. 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.
3. 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 D 5664.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

Factory mark each piece of lumber and plywood with type, grade, mill and grading agency, except omit marking from surfaces to receive transparent finish, and submit mill certificate that materials have been inspected and graded in accordance with grading standards if it cannot be marked on a concealed surface.

Keep materials dry during delivery, storage and handling. Store lumber and plywood in stacks with provision for air circulation. Protect bottom of stacks against contact with damp surfaces. Protect exposed materials from weather with waterproof sheeting. Do not store dressed or treated lumber outdoors.

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. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA registered label.

06 10 00 Rough Carpentry

Lumber shall comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.
4. The maximum moisture content of the lumber is to be 19%.

Roof and Floor Joists shall be No.2 Douglas Fir-Larch, and 19% maximum moisture content.
Studs shall be Stud Grade, Douglas Fir-Larch, and 19% maximum moisture content.
Other Framing Material shall be No.2 Douglas Fir-Larch, and 19% maximum moisture content.
Grounds and Nailer shall be No.2 Douglas Fir-Larch, and 19% maximum moisture content.

Telephone and electrical equipment backing panels are to be fire retardant treated, 3/4 in. thick. Miscellaneous concealed plywood to be fire retardant treated 1/2 in. thick with 15% maximum moisture.
Where rough carpentry is exposed to weather, in ground contact, pressure preservative treated, or in area of high relative humidity, specify fasteners that are hot-dip galvanized or stainless steel to minimize corrosion potential.
A moisture seal or barrier shall be placed under or around wood members which bear on or are embedded in concrete or masonry. Seal shall be asphalt mastic, or other approved type.
Provide wood grounds and blocking of size and shape required for plaster work, for securing toilet accessories, finish hardware, door stops, and trim for chalkboards, tackboards, etc. Install true to line, level plumb, and well secured in place. Wood blocking or nailers on dry wall metal framing systems shall be bolted or screwed in place.

06 16 00 Sheathing

This section includes exterior building envelope glass-mat wall sheathing, plywood roof and parapet sheathing, and subflooring.

A pre-installation conference is required for this scope of Work. Review water-resistant glass-mat gypsum sheathing requirements and installation, special details, transitions, mockups, air-leakage testing, protection, and work scheduling that covers water-resistant glass-mat gypsum sheathing.

Glass-mat Sheathing for Exterior Building Envelope
Glass-Mat Gypsum Sheathing: ASTM C 1177 /C 1177M, Type X - 5/8”.

The water-resistant glass-mat gypsum sheathing system must provide a thermal barrier to the interior and seal with adjacent construction. The system shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. The system shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed assemblies waterproofing, tie-ins to other installed air barriers, and transitions at perimeter conditions without deterioration and air leakage exceeding

specified limits.

Plywood Sheathing for Clay Tile Roofing Substrates

Plywood Sheathing: **DOC PS1 (Structural Plywood), Exterior, Structural I**. Use FM Approved fire retardant (FR) pressure treated plywood minimum 23/32 in. thick (nominal ¾ in) for all new wood roof deck sheathing construction. Plywood within the roof system shall not be less than C-D. Provide an APA-rated sheathing not treated with a preservative. Grade stamps must be visible for inspection.

Fire-resistance ratings as tested according to ASTM E 119. Identify products with appropriate markings of applicable testing agency. Fire-resistance ratings indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

Preservative treatment by pressure process: AWPA U1; use Category UC3b for exterior construction not in contact with ground and use Category UC4a for items in contact with ground. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

Fire-retardant-treated plywood by pressure process shall be provided 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. Use treatment that does not promote corrosion of metal fasteners.

Exterior Type: Treated materials shall comply with requirements specified for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated. Kiln-dry material after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

Plywood Sheathing Roof Deck Securement

Roof deck sheathing shall be attached to structural steel decking to meet the requirements of FM Global Property Loss Prevention Data Sheet 1-29, Roof Deck Securement and Above-Deck Roofing Components, Section 2.2.7. Plywood roof decking should be fastened in accordance with APA standard guidelines "Designing Commercial Roofs to Withstand Wind Uplift Forces" which can be found at https://www.apawood.org/. At a minimum, provide 2" long, #10 Size, Type A, wafer head, self-drilling, screw type fasteners spaced to meet the wind uplift requirements stipulated in to achieve and FM 1-60 (field), FM 1-90 (perimeter), FM 1-135 (corners). Stainless steel, FNL coated, or galvanized screws are acceptable. If the plywood deck is to be attached to 20-gauge steel joists spaced 2-ft on-center, the following alternative attachment may be used: FM Approved No. 14 fasteners, spaced 1-ft o.c. (minimum 16-fasteners per 4 x 8 sheet of plywood). One example of an FM Approved No. 14 fastener is Olympic (OMG) SIP fastener, No. 14. However, there are certainly others.

Use FM Approved fastener to ensure tested pull-out resistance and appropriate quality.

06 20 23 Finish Carpentry

All finish carpentry shall comply with the latest standards established by the Architectural Woodwork Institute (AWI). Fabrication shop shall be a certified participant in AWI's Quality Certification Program.

Installer shall be a certified participant in AWI's Quality Certification Program.
Specify to provide AWI Quality Certification Program labels and certificates indicating that woodwork, including installation, complies with requirements of grades specified.

Do not deliver or install woodwork until the building is enclosed, in the dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 17 and 50 percent during the remainder of the construction period.

Do not install finished carpentry materials that are wet, moisture, or mold defective.

Proceed with installation of exterior finished carpentry only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish can be

applied without exposure to rain, snow, or dampness.

06 40 23 Architectural Woodwork

Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of architectural woodwork indicated for construction, finishes, installation, and other requirements. Architectural Woodwork Standards Premium Grade is required for all Projects. Architectural woodwork materials, fabrication and installation shall be detailed and specified in compliance with the most recent edition of the AWI “Quality Standards," guidelines.

Fabricator and Installer’s Qualifications: Fabrication shop shall be a certified participant in AWI's Quality Certification Program. Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

Acceptable manufacturers for plastic laminate clad architectural woodwork Formica, Wilsonart, Lamin-Art, Pionite, and others as preapproved by TTUS FP&C and the Authority Having Jurisdiction. Specify high-pressure decorative laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.

Conduct Preinstallation Conference at Project site.

Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections, to ensure that interior architectural woodwork can be supported and installed as indicated.

Submittals: Product Data, Shop Drawings, Qualifications and Certifications Data (products, manufacturer’s, installers), samples for selection and verification, Warranty.

Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution. Build mockups of typical interior architectural woodwork as shown on Drawings. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless

Owner specifically approves such deviations by Change Order.

Do not deliver or install interior architectural woodwork until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels designed for building occupants for the remainder of the construction period. Comply with the Architectural Woodwork Standards, Section 2. Do not deliver interior architectural woodwork until painting and similar finish operations that might damage woodwork have been completed in installation areas. Store woodwork in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article. Handle and store fire-retardant-treated wood to comply with chemical treatment manufacturer's written instructions.

Where architectural woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being concealed by construction and indicate measurements on Shop Drawings.

Fire-Rated Frames: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C. Smoke- and Draft-Control Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on NFPA 257 or UL 9 testing standards.

Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, 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. Wood species, trims, and transparent finishes are to be proposed by Architect for Owner review and approval.

Comply with the Architectural Woodwork Standards for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing interior architectural woodwork, as applicable to each unit of work. Shop prime with one coat of wood primer as specified in Section 09 91 23 Interior Painting. For transparent finish, shop-seal concealed surfaces with required pretreatments and first coat of finish as specified in Section 09 93 00 Staining and Transparent Finishing.

Install interior architectural woodwork to comply with same grade as item to be installed. Assemble interior architectural woodwork and complete fabrication at Project site to the extent that it was not completed during shop fabrication. Clean interior architectural woodwork on exposed and semi-exposed surfaces.

06 64 00 Plastic Paneling

Obtain plastic paneling and trim accessories from single manufacturer. Acceptable manufacturers include Marlite, Crane, Kal-Lite, and others as preapproved by TTUS FP&C and the Authority Having Jurisdiction.

Do not deliver or install plastic paneling until spaces are enclosed, weathertight, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

Surface-Burning Characteristics: As follows when tested by a qualified testing agency according to ASTM E 84. Identify products with appropriate markings from an applicable testing agency. Flame-Spread Index of 25 or less and Smoke-Developed of 450 or less.

Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work. Proceed with installation only after unsatisfactory conditions have been corrected.

Install plastic paneling according to manufacturer's written instructions. Install panels in a full spread of adhesive. Maintain uniform space between adjacent panels and between panels and

floors, ceilings, and fixtures. Fill the space with sealant. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.