

**SECTION 06 10 00
ROUGH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural dimension lumber framing.
- B. Exposed timber structural framing.
- C. Structural composite lumber framing.
- D. Nonstructural dimension lumber framing.
- E. Rough opening framing for doors, windows, and roof openings.
- F. Sheathing.
- G. Subflooring.
- H. Underlayment.
- I. Roof-mounted curbs.
- J. Roofing nailers.
- K. Roofing cant strips.
- L. Preservative treated wood materials.
- M. Fire retardant treated wood materials.
- N. Miscellaneous framing and sheathing.
- O. Communications and electrical room mounting boards.
- P. Concealed wood blocking, nailers, and supports.
- Q. Miscellaneous wood nailers, furring, and grounds.
- R. Wall sheathing with factory applied water-resistive and air barrier sheet.
- S. Roof sheathing with factory applied roofing underlayment.

1.02 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 30 00 - Cast-in-Place Concrete: Setting anchors in concrete.
- C. Section 03 54 00 - Cast Underlayment.
- D. Section 05 12 00 - Structural Steel Framing: Prefabricated beams and columns for support of wood framing.
- E. Section 05 50 00 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- F. Section 06 12 19 - Structural Insulated Panels.
- G. Section 06 13 23 - Heavy Timber Framing.
- H. Section 06 13 26 - Heavy Timber Trusses.
- I. Section 06 15 00 - Wood Decking.
- J. Section 06 17 33 - Wood I-Joists.
- K. Section 06 17 36 - Metal-Web Wood Joists.
- L. Section 06 17 53 - Shop-Fabricated Wood Trusses.
- M. Section 06 18 00 - Glued-Laminated Construction.
- N. Section 07 25 00 - Weather Barriers: Water-resistive barrier over sheathing.
- O. Section 07 26 00 - Vapor Retarders: Vapor retarder over sheathing.

- P. Section 07 27 00 - Air Barriers: Air barrier over sheathing.
- Q. Section 07 62 00 - Sheet Metal Flashing and Trim: Sill flashings.
- R. Section 07 72 00 - Roof Accessories: Prefabricated roof curbs.
- S. Section 09 21 16 - Gypsum Board Assemblies: Gypsum-based sheathing.
- T. Section 31 31 16 - Termite Control: Field-applied termiticide and mildewcide for wood materials.

1.03 REFERENCE STANDARDS

- A. ANSI A190.1 - Product Standard for Structural Glued Laminated Timber; 2022.
- B. ANSI A208.1 - American National Standard for Particleboard; 2022.
- C. APA PRI-400 - Performance Standard for Residential I-Joists; 2021.
- D. APA PRR 410 - Standard for Performance-Rated Engineered Wood Rim Boards; 2021.
- E. APA Z725 - Performance Rated I-Joists Design and Construction Guide; 2024.
- F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- H. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process; 2022a.
- I. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
- J. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.
- K. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
- L. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- M. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- N. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- O. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.
- P. ASTM C1338 - Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings; 2019 (Reapproved 2022).
- Q. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- R. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).
- S. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- T. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.
- U. ASTM D5055 - Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists; 2019, with Editorial Revision (2020).
- V. ASTM D5456 - Standard Specification for Evaluation of Structural Composite Lumber Products; 2021, with Editorial Revision.

- W. ASTM D7672 - Standard Specification for Evaluating Structural Capacities of Rim Board Products and Assemblies; 2024.
- X. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- Y. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- Z. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.
- AA. ASTM E2556/E2556M - Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment; 2010 (Reapproved 2016).
- BB. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- CC. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.
- DD. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024.
- EE. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- FF. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
- GG. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- HH. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- II. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2024, with Errata.
- JJ. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.
- KK. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- LL. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- MM. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016, with Editorial Revision (2021).
- NN. ICC-ES AC310 - Acceptance Criteria for Water-Resistive Membranes Factory-Bonded to Wood-Based Structural Sheathing, Used as Water-Resistive Barriers; 2008, with Editorial Revision (2021).
- OO. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2021, with Editorial Revision (2022).
- PP. NELMA (SGR) - Standard Grading Rules for Northeastern Lumber; 2024.
- QQ. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.
- RR. PS 1 - Structural Plywood; 2023.
- SS. PS 2 - Performance Standard for Wood Structural Panels; 2018.
- TT. PS 20 - American Softwood Lumber Standard; 2025.
- UU. RIS (GR) - Standard Specifications for Grades of California Redwood Lumber; 2019.

- VV. SPIB (GR) - Standard Grading Rules; 2021.
- WW. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.
- XX. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.
- YY. WCLIB (GR) - WCLB Standard Grading Rules for West Coast & Imported Softwood Lumber No.18; 2024.
- ZZ. WWPA G-5 - Western Lumber Grading Rules; 2021.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
- C. Structural Composite Lumber: Submit manufacturer's published structural data including span tables, marked to indicate which sizes and grades are being used; if structural composite lumber is being substituted for dimension lumber or timbers, submit grading agency structural tables marked for comparison.
- D. Samples: For rough carpentry members exposed to view, submit two samples, ____ by ____ inch in size illustrating wood grain, color, and general appearance.
- E. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.
- F. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.
- G. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
- H. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.
- I. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
 - 1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
 - 2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.
- B. Air Barrier Association of America (ABAA) Evaluated Materials Program (EAP); www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for materials and workmanship commencing on Date of Substantial Completion.
- C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Douglas Fir-Larch, unless otherwise indicated.
 - 2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
 - 3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
 - 4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Provide sustainably harvested wood; see Section 01 60 00 - Product Requirements for requirements.
- C. Provide wood harvested within a 500 mile radius of the project site.
- D. Lumber salvaged from deconstruction or demolition of existing buildings or structures is permitted in lieu of sustainably harvested lumber provided it is clean, denailed, and free of paint and finish materials, and other contamination; identify source.
 - 1. Where salvaged lumber is used for structural applications, provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc; www.alsc.org.
- E. Lumber fabricated from recovered timber is permitted in lieu of sustainably harvested lumber, unless otherwise noted, provided it meets the specified requirements for new lumber and is free of contamination; identify source.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Northeastern Lumber Manufacturers Association; NELMA (SGR).
- B. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- C. Grading Agency: Redwood Inspection Service; RIS (GR).
- D. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).
- E. Grading Agency: Western Wood Products Association; WWPA G-5.
- F. Sizes: Nominal sizes as indicated on drawings, S4S.
- G. Moisture Content: S-dry or MC19.
- H. Stud Framing (2 by 2 through 2 by 6):
 - 1. Species: Allowed under referenced grading rules.
 - 2. Species: Douglas Fir-Larch.
 - 3. Grade: No. 2.
 - 4. Products:
 - a. Roseburg Forest Products; Stud Length Lumber: www.roseburg.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

- I. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
 - 1. Machine stress-rated (MSR) as follows:
 - a. Fb-single; minimum extreme fiber stress in bending: 1350 psi.
 - b. E; minimum modulus of elasticity: 1,300,000 psi.
 - 2. Species: Allowed under grading rules.
 - 3. Species: Douglas Fir-Larch.
 - 4. Grade: No. 1 and Better.
 - 5. Species and Grades: As indicated on drawings for various locations.
- J. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.03 EXPOSED DIMENSION LUMBER

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- C. Grading Agency: Redwood Inspection Service; RIS (GR).
- D. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).
- E. Grading Agency: Western Wood Products Association; WWPA G-5.
- F. Sizes: Nominal sizes as indicated on drawings.
- G. Surfacing: S4S.
- H. Moisture Content: S-dry or MC19.
- I. Stud Framing (2 by 2 through 2 by 6):
 - 1. Species: Western Cedar.
 - 2. Grade: Clear.
- J. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
 - 1. Species: Redwood.
 - 2. Grade: Select Heart.
 - 3. Species and Grades: As indicated on drawings for various locations.

2.04 TIMBERS FOR CONCEALED APPLICATIONS

- A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).
- B. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).
- C. Grading Agency: Western Wood Products Association; WWPA G-5.
- D. Sizes: Nominal sizes as indicated on drawings, S4S.
- E. Moisture Content: S-dry (23 percent maximum).
- F. Beams and Posts 5 inches and over in thickness:
 - 1. Species: Allowed under referenced grading rules.
 - 2. Species: Douglas Fir-Larch.
 - 3. Grade: Select Structural.
 - 4. Species and Grade: Comply with the following design values in accordance with applicable building code:
 - a. Fb-single; minimum extreme fiber stress in bending: 1200 psi.
 - b. E; minimum modulus of elasticity: 1,500,000 psi.

2.05 EXPOSED TIMBERS

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Moisture Content: Kiln-dry (20 percent maximum).

- C. Surfacing: S4S.
- D. Species: Redwood.
- E. Grade: Clear Heart Structural.

2.06 STRUCTURAL COMPOSITE LUMBER

- A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.
- B. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.
- C. Structural Composite Lumber Materials: Factory-fabricated engineered wood products consisting of wood veneers, strands, or flakes pressed with moisture-resistant adhesive into blocks of material, evaluated in accordance with ASTM D5456.
 - 1. Laminated Veneer Lumber (LVL): Engineered wood products consisting of thin wood veneer bonded together with adhesive with grain of veneers running parallel to long dimension.
 - a. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi, minimum.
 - b. Application: For headers, beams, and rafters.
 - c. Products:
 - 1) Boise Cascade Company; Versa-Lam LVL: www.bc.com/#sle.
 - 2) RedBuilt LLC; Redbuilt Laminated Veneer Lumber: www.redbuilt.com/#sle.
 - 3) Roseburg Forest Products; RigidLam LVL: www.roseburg.com/#sle.
 - 4) Weyerhaeuser Company; ____: www.weyerhaeuser.com/#sle.
 - 5) _____.
 - 6) Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. Parallel Strand Lumber (PSL): Engineered wood products consisting of long wood strands bonded together with adhesive with grain running parallel to long dimension.
 - a. Strand Length-to-Thickness Ratio: Approximately 300.
 - b. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi, minimum.
 - c. Application: For headers, beams, and columns.
 - d. Products:
 - 1) Weyerhaeuser Company; ____: www.weyerhaeuser.com/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
 - 3. Laminated Strand Lumber (LSL): Engineered wood products consisting of flaked wood strands bonded together with adhesive.
 - a. Strand Length-to-Thickness Ratio: Approximately 150.
 - b. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi, minimum.
 - c. Application: For studs and millwork.
 - d. Products:
 - 1) Tolko Industries Ltd; ____: www.tolko.com/#sle.
 - 2) Weyerhaeuser Company; ____: www.weyerhaeuser.com/#sle.
 - 3) _____.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
 - 4. Oriented Strand Lumber (OSL): Engineered wood product consisting of flaked wood strands bonded together with adhesive.
 - a. Strand Length-to-Thickness Ratio: Approximately 75.
 - b. Manufacturer's Published Modulus of Elasticity, E: 1,800,000 psi, minimum.
 - c. Application: For studs and millwork.
 - d. Products:
 - 1) Tolko Industries Ltd; ____: www.tolko.com/#sle.
 - 2) Weyerhaeuser Company; ____: www.weyerhaeuser.com/#sle.

- 3) _____.
- 4) Substitutions: See Section 01 60 00 - Product Requirements.

D. Structural Composite Lumber Assemblies:

1. Wood I-Joists: Factory-prefabricated engineered wood structural members consisting of structural composite flanges and oriented strand board webs, bonded together with adhesive, evaluated in accordance with ASTM D5055.
 - a. Live Load Deflection: L/480, maximum.
 - b. Depth: 9-1/2 inches.
 - c. Joist Series: PRI-20 in accordance with APA PRI-400.
 - d. Markings: Comply with APA Z725.
 - e. Products:
 - 1) Boise Cascade Company; _____: www.bc.com/#sle.
 - 2) Roseburg Forest Products; _____: www.roseburg.com/#sle.
 - 3) Weyerhaeuser Company; _____: www.weyerhaeuser.com/#sle.
 - 4) _____.
 - 5) Substitutions: See Section 01 60 00 - Product Requirements.
2. Rim Boards: Factory-prefabricated insulated engineered wood component that fills space between sill plate and bottom plate of wall and ties floor joists together; manufactured in accordance with ANSI A190.1; evaluated in accordance with ASTM D7672.
 - a. Depth: Match depth of adjacent joists.
 - b. Thickness: 1 inch.
 - c. Insulation: 1-1/2-inch thick polyisocyanurate, ASTM C1289.
 - d. Inside Panel Thickness: 7/16-inch thick oriented strand board.
 - e. Markings: Comply with APA PRR 410.
 - f. Products:
 - 1) Boise Cascade Company; _____: www.bc.com/#sle.
 - 2) Roseburg Forest Products; _____: www.roseburg.com/#sle.
 - 3) Weyerhaeuser Company; _____: www.weyerhaeuser.com/#sle.
 - 4) _____.
 - 5) Substitutions: See Section 01 60 00 - Product Requirements.
 - 6) Source Limitations: Furnish products produced by same manufacturer as I-joists.

2.07 EXPOSED BOARDS

- A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.
- B. Moisture Content: Kiln-dry (15 percent maximum).
- C. Surfacing: S4S.
- D. Species: Douglas Fir.
- E. Grade: No. 2, 2 Common, or Construction.

2.08 CONSTRUCTION PANELS

- A. Subfloor/Underlayment Combination: PS 1 or PS 2 type, rated Single Floor.
 1. Panel Type: Plywood or Oriented Strand Board.
 2. Bond Classification: Exposure 1.
 3. Span Rating: 48.
 4. Performance Category: 1-1/8 PERF CAT.
 5. Edges: Tongue and groove.
 6. Products:
 - a. Roseburg Forest Products; Softwood Plywood: www.roseburg.com/#sle.
 - b. _____.
 - c. _____.

- d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Subflooring: Oriented strand board wood structural panel; PS 2, rated Single Floor.
 - 1. Bond Classification: Exterior.
 - 2. Performance Category: 19/32 PERF CAT.
 - 3. Span Rating: 20.
 - 4. Edges: Square.
 - 5. Edges: Tongue and groove.
 - 6. Surface Finish: Fully sanded face.
 - 7. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 200 days.
 - 8. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches, 19.2 inches and 24 inches on center, respectively.
 - 9. Warranty: Manufacturer's standard lifetime limited warranty against manufacturing defects and that panels will not delaminate or require sanding due to moisture absorption damage from exposure to weather for up to the stated period.
 - 10. Products:
 - a. Georgia-Pacific LLC; DryGuard Enhanced OSB Sub-Floor: www.buildgp.com/#sle.
 - b. Huber Engineered Woods, LLC; AdvanTech Subflooring with AdvanTech Subfloor Adhesive: www.huberwood.com/#sle.
 - c. Louisiana-Pacific Corporation; TopNotch Sub-Flooring 350: www.lpcorp.com/#sle.
 - d. Weyerhaeuser Company; ____: www.weyerhaeuser.com/#sle.
 - e. _____.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Subflooring: PS 2 type, rated Sheathing.
 - 1. Bond Classification: Exterior.
 - 2. Span Rating: 48.
 - 3. Performance Category: 3/4 PERF CAT.
- D. Subflooring: Particleboard, ANSI A208.1, Grade M-2 EXTERIOR GLUE waferboard; 3/4 inch thick, square edge.
- E. Subflooring: Magnesium oxide board.
 - 1. Products:
- F. Subflooring: Structural cementitious subfloor panels.
 - 1. Size: 48 inches wide nominal, by 96 inches long, nominal.
 - 2. Thickness: 3/4 inch, nominal.
 - 3. Edges: Square along width; tongue and groove along length.
 - 4. Span: 24 inches, maximum.
 - 5. Fire Resistance: Noncombustible, when tested in accordance with ASTM E136.
 - 6. Surface Burning Characteristics: Flame spread index of 0; smoke-developed Index of 0; when tested in accordance with ASTM E84.
 - 7. Mold Resistance: Rating of 10, when tested in accordance with ASTM D3273.
 - 8. Products:
 - a. USG Corporation; Structural Panel Concrete Subfloor: www.usg.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Subflooring: Magnesium-oxide sheets reinforced with embedded fiberglass mesh layers.
- H. Underlayment: APA Underlayment; plywood, Exposure 2, 1/2 inch thick. Fully sanded faces at resilient flooring.
- I. Underlayment: Particleboard, ANSI A208.1, Grade PBU.
- J. Underlayment: Magnesium oxide board.

1. Panel Thickness: 1/2 inch, nominal.
 2. Fire Resistance: ASTM E84, Class A1; zero flame spread and zero smoke developed.
 3. Mold and Mildew Resistance: Zero growth when tested according to ASTM G21.
 4. Products:
 - a. Huber Engineered Woods, LLC; EXACOR Underlayment: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- K. Roof Sheathing: PS 2 type, rated Structural I Sheathing.
1. Bond Classification: Exterior.
 2. Span Rating: 60.
 3. Performance Category: 3/4 PERF CAT.
- L. Roof and Floor Sheathing: Structural composite sheathing panels.
1. Noncombustible, composite panel comprised of minimum 0.46-inch thick material laminated with water-based adhesive to steel sheet with minimum 20-gauge, 0.033-inch thick metal sheet, complying with ASTM A653/A653M. Grade 33, with G40 minimum hot-dip galvanized coating complying with ASTM A924/A924M.
 - a. Sizes: 48 by 48 inches, including custom length of 96 inches.
 - b. Products:
 - 1) MarinoWARE; Sure-Board Series 200S: www.marinoware.com/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
- M. Roof Sheathing: Particleboard, ANSI A208.1, Grade M-3 EXTERIOR GLUE; square edges, with panel clips.
- N. Roof Sheathing: Oriented strand board wood structural panel; PS 2.
1. Grade: Structural 1 Sheathing.
 2. Bond Classification: Exposure 1.
 3. Performance Category: 5/8 PERF CAT.
 4. Span Rating: 40/20.
 5. Edges: Square.
 6. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 500 days.
 7. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
 8. Warranty: Manufacturer's standard lifetime limited warranty against manufacturing defects and that panels will not delaminate or require sanding due to moisture absorption damage from exposure to weather for up to the stated period.
 9. Products:
 - a. Huber Engineered Woods, LLC; AdvanTech Sheathing: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- O. Roof Sheathing: Oriented strand board structural wood panel, PS 2, with factory laminated roofing underlayment layer.
1. Sheathing Panel:
 - a. Grade: Structural 1 sheathing.
 - b. Size: 4 feet wide by 8 feet long.
 - c. Performance Category: 5/8 PERF CAT.
 - d. Span Rating: 40/20.
 - e. Edge Profile: Square edge.

2. Integral Roofing Underlayment Layer: Medium density, phenolic impregnated kraft paper overlay.
 3. Exposure Time: Sheathing undamaged and integral roofing underlayment layer intact after exposure to weather for up to 180 days.
 4. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center.
 5. Seam Tape: Manufacturer's standard pressure-sensitive, self-adhering, cold-applied seam tape consisting of polyolefin film with acrylic adhesive.
 6. Warranty: Manufacturer's standard 30 year limited system warranty of:
 - a. Performance: Panel and tape resistance to water penetration; tape adhesion.
 - b. Material: Free from manufacturing defects and panel delamination.
 7. Products:
 - a. Huber Engineered Woods, LLC; ZIP System Roof/Wall Sheathing and ZIP System Seam Tape: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- P. Roof Sheathing: Wood structural panels with noncombustible overlayment or coating factory-bonded to interior face of plywood panels.
1. Overlayment Noncombustibility Testing: Comply with ICC (IBC) testing requirements.
 2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84 or UL 723.
 3. Plywood Panels:
 - a. Comply with PS 1.
 - b. Comply with PS 2.
 - c. Comply with PS 1 or PS 2.
 - d. Performance Category and Span Rating: 15/32 PERF CAT and 32/16 span rating.
 - e. Bond Classification: Exposure 1.
 - f. Grade: Structural 1 C-D.
 - g. Sizes: 48 by 96 inches.
 - h. Edges: Square.
 4. Oriented Strand Board (OSB): Comply with PS 2.
 - a. Performance Category and Span Rating: 15/32 PERF CAT and 32/16 span rating.
 - b. Bond Classification: Exposure 1.
 - c. Grade: Structural 1 C-D.
 - d. Sizes: 48 by 96 inches.
 - e. Edges: Square.
 5. Products:
 - a. Arclin, Inc; FirePoint 2500 Roof Sheathing: www.firepoint.arclin.com/#sle.
 - b. Louisiana-Pacific Corporation; FlameBlock: www.lpcorp.com/#sle.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- Q. Roof Sheathing: Wood construction panel laminated to insulation board.
1. Construction Panel: 7/16 inch (11 mm) oriented strand board (OSB).
 2. Insulation Board: Polyisocyanurate foam plastic with cellulosic felt facer or glass fiber mat facer on major surface opposite construction panel.
 3. Finished Panel: Comply with ASTM C1289, Type V.
 4. Products:
 - a. Hunter Panels; _____: www.hunterpanels.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

- R. Roof Sheathing, Vented: Wood construction panel and 1 inch solid wood spacers attached to insulation board.
1. Construction Panel: 7/16 inch (11 mm) oriented strand board (OSB).
 2. Insulation Board: Rigid polyisocyanurate (ISO) insulation board, ASTM C1289, Type II, Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of the core foam.
 3. Products:
 - a. Hunter Panels; _____: www.hunterpanels.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- S. Roof Sheathing: Magnesium oxide board.
1. Classification: PS 2, Exposure 1.
 2. Panel Thickness: _____ inch, nominal.
 3. Span: 24 inches, maximum.
 4. Fire Resistance: ASTM E84, Class A1; zero flame spread and zero smoke developed.
 5. Mold and Mildew Resistance: Zero growth when tested according to ASTM G21.
 6. Products:
 - a. _____.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- T. Roof Sheathing: Structural cementitious roof sheathing panels.
1. Size: 48 inches wide nominal, by 96 inches long, nominal.
 2. Panel Thickness: 3/4 inch, nominal.
 3. Edges: Square edges.
 4. Span: 48 inches, maximum.
 5. Fire Resistance: Noncombustible, when tested in accordance with ASTM E136.
 6. Surface Burning Characteristics: Flame spread index of 0; smoke-developed Index of 0; when tested in accordance with ASTM E84.
 7. Mold Resistance: Rating of 10, when tested in accordance with ASTM D3273.
 8. Products:
 - a. USG Corporation; USG Structural Panel Concrete Roof Deck: www.usg.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- U. Wall Sheathing: PS 2 type.
1. Bond Classification: Exterior.
 2. Grade: Structural I Sheathing.
 3. Span Rating: 24.
 4. Performance Category: 5/16 PERF CAT.
 5. Edge Profile: Square edge.
- V. Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I.
- W. Wall Sheathing: Particleboard, ANSI A208.1, Grade M-3 EXTERIOR GLUE.
- X. Wall Sheathing: Fiberboard, ASTM C208, Type IV, Grade 1 regular, square edges.
- Y. Wall Sheathing: See Section 09 21 16.
- Z. Wall Sheathing: Gypsum, complying with requirements of ASTM C1396/C1396M for gypsum sheathing, V-shaped long edges, 5/8 inch Type X fire resistant.
- AA. Wall Sheathing: Glass mat faced gypsum, ASTM C1177/C1177M, 5/8 inch Type X fire resistant.

1. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly.
 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 3. Edges: Square.
 4. Products:
 - a. CertainTeed Corporation; GlasRoc Brand: www.certainteed.com/#sle.
 - b. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.
 - c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Fire-Shield Sheathing: www.goldbondbuilding.com/#sle.
 - d. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Regular 5/8 in. (15.9 mm): www.usg.com/#sle.
 - e. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Firecode USGX 5/8 in. (15.9 mm): www.usg.com/#sle.
 - f. USG Corporation; Securock Brand Glass-Mat Sheathing Regular 5/8 in. (15.9 mm): www.usg.com/#sle.
 - g. USG Corporation; Securock Brand Glass-Mat Sheathing Regular 1/2 in. (12.7 mm): www.usg.com/#sle.
 - h. USG Corporation; Securock Brand Glass-Mat Sheathing Firecode SHX 5/8 in. (15.9 mm): www.usg.com/#sle.
 - i. _____.
 - j. Substitutions: See Section 01 60 00 - Product Requirements.
- BB. Wall Sheathing: Glass mat faced gypsum with integral water-resistive and air barrier, ASTM C1177/C1177M, 5/8 inch thick.
1. Edges: Square.
 2. Water Vapor Permeance: 1 perm, minimum, when tested in accordance with ASTM E96/E96M.
 3. Air Permeance, Sheathing: 0.001 cfm/sq ft, maximum, when tested in accordance with ASTM E2178.
 4. Air Permeance, Assembly: 0.04 cfm/sq ft, maximum, when tested in accordance with ASTM E2357.
 5. Fluid-Applied Flashing: Approved by sheathing manufacturer.
 6. Warranty:
 - a. Exposure: Manufacturer's standard; 12 months, against exposure damage, and dated from installation of product.
 - b. Defect: Manufacturer's standard; 5 years, against manufacturing defects, and dated from purchase of product.
 - c. Material: Manufacturer's standard; 5 years, dated from Date of Substantial Completion.
 - d. Effective Drainage Warranty: 12 years, dated from installation of product, when sheathing is used as substrate under approved, water-managed exterior insulation finish system (EIFS).
 7. Products:
 - a. Georgia-Pacific LLC; DensElement Barrier System: www.DensElement.com/#sle.
 - b. Tremco Commercial Sealants & Waterproofing; Securock ExoAir 430 Panel: www.tremcosealants.com/#sle.
 - c. USG Corporation; Securock ExoAir 430 Panel 5/8 in. (15.9 mm): www.usg.com/#sle.
 - d. USG Corporation; Securock ExoAir 430 Panel 1/2 in. (12.7 mm): www.usg.com/#sle.
 - e. _____.
 - f. Substitutions: See Section 01 60 00 - Product Requirements.
- CC. Wall Sheathing: Oriented strand board wood structural panel; PS 2.
1. Grade: Structural 1 Sheathing.
 2. Bond Classification: Exposure 1.
 3. Performance Category: 5/8 PERF CAT.

4. Span Rating: 40/20.
5. Edges: Square.
6. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 500 days.
7. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
8. Warranty: Manufacturer's standard lifetime limited warranty against manufacturing defects and that panels will not delaminate or require sanding due to moisture absorption damage from exposure to weather for up to the stated period.
9. Products:
 - a. Huber Engineered Woods, LLC; AdvanTech Sheathing: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

DD. Wall Sheathing: Oriented strand board structural wood panel with factory laminated water-resistive barrier layer.

1. Sheathing Panel: PS 2, Exposure 1.
 - a. Size: 4 feet wide by 8 feet long.
 - b. Grade: Sheathing.
 - c. Performance Category: 7/16 PERF CAT.
 - d. Span Rating: 24/16.
 - e. Edge Profile: Square edge.
2. Integral Water-Resistive Barrier: Sheet material qualifying as a Grade D water-resistive barrier; complying with ICC-ES AC310.
3. Water Vapor Permeance of Water-Resistive Barrier: 12 to 16 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure B.
4. Maximum Allowable Air Leakage of Assembly: Comply with ASTM E2357.
 - a. Infiltration: 0.0072 cfm/sq ft, maximum, at a pressure differential of 1.57 psf.
 - b. Exfiltration: 0.0023 cfm/sq ft, maximum, at a pressure differential of 1.57 psf.
5. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
6. Seam Tape: Manufacturer's standard pressure-sensitive, self-adhering, cold-applied, seam tape.
7. Warranty: Manufacturer's standard 30 year limited system warranty.
 - a. Performance: Panel and tape resistance to water penetration; tape adhesion.
 - b. Material: Free from manufacturing defects and panel delamination.
8. Warranty: Manufacturer's standard, limited system warranty.
 - a. Residential Projects: Lifetime of the structure, limited to original owner.
 - b. Commercial Projects: Two year; transferable.
9. Manufacturers:
 - a. Georgia-Pacific LLC; ForceField Air and Water Barrier System: www.buildgp.com/#sle.
 - b. Huber Engineered Woods, LLC; ZIP System Roof/Wall Sheathing and ZIP System Seam Tape: www.huberwood.com/#sle.
 - c. Louisiana-Pacific Corporation; WeatherLogic: www.lpcorp.com/#sle.
 - d. _____.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.

EE. Wall Sheathing: Wood structural panels with noncombustible overlayment or coating factory-bonded to interior face of plywood panels.

1. Overlayment Noncombustibility Testing: Comply with ICC (IBC) testing requirements.
2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84 or UL 723.
3. Plywood Panels:

- a. Comply with PS 1.
 - b. Comply with PS 2.
 - c. Comply with PS 1 or PS 2.
 - d. Performance Category and Span Rating: 15/32 PERF CAT and 32/16 span rating.
 - e. Bond Classification: Exposure 1.
 - f. Grade: Structural 1 C-D.
 - g. Sizes: 48 by 96 inches.
 - h. Edges: Square.
4. Oriented Strand Board (OSB): Comply with PS 2.
- a. Performance Category and Span Rating: 15/32 PERF CAT and 32/16 span rating.
 - b. Bond Classification: Exposure 1.
 - c. Grade: Structural 1 C-D.
 - d. Sizes: 48 by 96 inches.
 - e. Edges: Square.
 - f. Products:
 - 1) Arclin, Inc; FirePoint 2500 Roof Sheathing: www.firepoint.arclin.com/#sle.
 - 2) Louisiana-Pacific Corporation; FlameBlock: www.lpcorp.com/#sle.
 - 3) _____.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
- FF. Wall Sheathing: Wood construction panel laminated to insulation board.
- 1. Construction Panel: 7/16 inch (11 mm) oriented strand board (OSB).
 - 2. Insulation Board: Polyisocyanurate foam plastic with cellulosic felt facer or glass fiber mat facer on major surface opposite construction panel.
 - 3. Finished Panel: Comply with ASTM C1289, Type V.
 - 4. Products:
 - a. Carlisle Coatings & Waterproofing, Inc; R2+ Base: www.carlisleccw.com/#sle.
 - b. Hunter Panels; Xci Ply: www.hunterpanels.com/#sle.
 - c. Rmax Inc; ECOMAXci FR Ply: www.rmax.com/#sle.
 - d. _____.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
- GG. Wall Sheathing: High pressure laminated cellulose fiber construction panel laminated to insulation board.
- 1. Construction Panel with Insulation Board: Laminated cellulose fiberboard and polyisocyanurate foam plastic with coated, laminated paper facer on major surface opposite fiberboard.
 - 2. Panel Thickness: 1 inch.
 - 3. Products:
 - a. Ox Engineered Products; OX-IS STRUCTURAL INSULATION: www.oxengineeredproducts.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- HH. Wall Sheathing: Oriented strand board structural wood panel with factory laminated rigid plastic insulation board, and water-resistive barrier layer.
- 1. Sheathing Panel: PS 2, Exposure 1.
 - 2. Thickness: 1 inch.
 - 3. Thermal Resistance, R-Value: 3.6, minimum.
 - 4. Insulation Board: Polyisocyanurate (ISO) insulation board; comply with ASTM C1289, Type II, Class 2 - Faced with coated polymer-bonded glass fiber mat facers on both major surfaces of the core foam.
 - 5. Integral Water-Resistive Barrier: Sheet material qualifying as a Grade D water-resistive barrier; complying with ICC-ES AC310.

6. Water Vapor Permeance of Water-Resistive Barrier: 12 to 16 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure B.
 7. Maximum Allowable Air Leakage of Assembly: Complying with ASTM E2357, 0.04 cfm/sq ft at a pressure differential of 1.57 psf.
 8. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
 9. Edge Profile: Square.
 10. Seam Tape: Manufacturer's standard pressure-sensitive, self-adhering, cold-applied, seam tape.
 11. Warranty: Manufacturer's standard 30 year limited system warranty.
 - a. Performance: Panel and tape resistance to water penetration; tape adhesion.
 - b. Material: Free from manufacturing defects and panel delamination.
 12. Products:
 - a. Huber Engineered Woods, LLC; ZIP System R-Sheathing: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- II. Wall Sheathing: Extruded Polystyrene (XPS) board insulation, ASTM C578.
1. Board Size: 48 by 96 inch.
 2. Board Thickness: 3/4 inch.
 3. Board Edges: Tongue-and-groove.
 4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88) per 1 inch at 75 degrees F mean temperature using ASTM C177 test method.
 5. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
 6. Type and Board Density: Type IV, 1.45 pcf (23 kg/cu m), minimum.
 7. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.
 8. Products:
 - a. _____.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- JJ. Wall Sheathing: Polyisocyanurate (ISO) thermal board insulation with Classification indicated, in compliance with ASTM C1289.
1. Thickness: 3/4 inch minimum thickness.
 2. Classifications:
 - a. Type I: Faced with aluminum foil on both major surfaces of core foam.
 - 1) Class 1 - Nonreinforced core foam.
 - 2) Compressive Strength: 16 psi, minimum.
 - 3) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0 at 75 degrees F.
 - b. Type II:
 - 1) Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of core foam.
 - 2) Compressive Strength: Classes 1-2-3, Grade 1 - 16 psi (110 kPa), minimum.
 - 3) Thermal Resistance, R-value: At 1 inch thick; Class 1, Grades 1-2-3 - 5.6 (0.97) at 75 degrees F.
 - 4) Thermal Resistance, R-value: At 1-1/2 inch thick; Class 1, Grades 1-2-3 - 8.4 (1.48) at 75 degrees F.
 - 5) Thermal Resistance, R-value: At 2 inch thick; Class 1, Grades 1-2-3 - 11.2 (1.97) at 75 degrees F.

- c. Type III: Faced with perlite insulation board on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
 - 1) Compressive Strength: 16 psi, minimum.
 - 2) Thermal Resistance, R-value: At 1-1/2 inch thick; 7.0 at 75 degrees F.
 - d. Type IV: Faced with cellulosic fiber insulating board on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
 - 1) Compressive Strength: 16 psi, minimum.
 - 2) Thermal Resistance, R-value: At 1-1/2 inch thick; 6.9 at 75 degrees F.
 - e. Type V: Faced with oriented strand board (OSB) or plywood on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
 - 1) Compressive Strength: 16 psi, minimum.
 - 2) Thermal Resistance, R-value: At 1-1/2 inch thick; 6.2 at 75 degrees F.
 - f. Type VII: Faced with glass mat faced gypsum board on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
 - 1) Compressive Strength: 16 psi, minimum.
 - 2) Thermal Resistance, R-value: At 1-1/2 inch thick; 7.0 at 75 degrees F.
3. Products:
- a. Hunter Panels; _____: www.hunterpanels.com/#sle.
 - b. Rmax Inc; ECOMAXci FR: www.rmax.com/#sle.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

KK. Wall Sheathing: Magnesium oxide board.

- 1. Classification: PS 2, Exposure 1.
- 2. Panel Thickness: _____ inch, nominal.
- 3. Span: 24 inches, maximum.
- 4. Fire Resistance: ASTM E84, Class A1; zero flame spread and zero smoke developed.
- 5. Mold and Mildew Resistance: Zero growth when tested according to ASTM G21.
- 6. Products:
 - a. _____.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

LL. Wall Sheathing: Composite panels composed of foam insulation fused to magnesium oxide (MgO) panels with factory-applied, air- and water-resistive barrier applied to panel exterior face.

- 1. Insulation: Rigid polyurethane foam; 3.23 pcf nominal density.
 - a. Closed cell content equal to or greater than 90 percent.
 - b. Surface Burning Characteristics: Class A when tested in accordance with ASTM E84.
- 2. Oxide (MgO) Sheathing Panels:
 - a. Thickness: 1/2 inch.
 - b. Surface Burning Characteristics: Class A when tested in accordance with ASTM E84 or UL 723.
- 3. Air- and Water-Resistive Barrier (AWB): Factory-fluid-applied membrane.
 - a. Air Leakage Rate: When tested in accordance with ASTM E283/E283M:
 - 1) 0.01 cfm/sq ft with pressure difference of 1.6 psf.
 - 2) 0.04 cfm/sq ft with pressure difference of 6.27 psf.
 - b. Water Penetration: Tested in accordance with ASTM E331, with pressure difference of 6.27 psf for two hours without failure.

4. Structural Performance: Manufacturer's assemblies tested in accordance with ASTM E330/E330M; see ICC Listing Report ESL-1306.
5. Fire Resistance: Manufacturer's assemblies tested in accordance with ASTM E119 and UL 263; see ICC Listing Report ESL-1302.
6. Fire Propagation: Manufacturer's assemblies tested in accordance with NFPA 285; see ICC Listing Report ESL-1442.
7. Fungi Resistance: Tested in accordance with ASTM C1338.
8. Composite Panel Size: 48 by 96 inches.
9. Composite Panels with One MgO Sheathing Layer:
 - a. Total Composite Panel Thickness and Thermal Resistance:
 - 1) 2 inches; R-10.
 - 2) 2-3/4 inches; R-15.
 - 3) 3-3/4 inches; R-21.
 - b. Products:
 - 1) DuPont de Nemours, Inc; ArmorWall Plus FR SIS: www.dupont.com/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.
10. Composite Panels with Two MgO Sheathing Layers:
 - a. Total Composite Panel Thickness and Thermal Resistance:
 - 1) 2-3/4 inches; R-11.
 - 2) 3-3/4 inches; R-17.
 - 3) 4-1/4 inches; R-21.
 - b. Products:
 - 1) DuPont de Nemours, Inc; ArmorWall SP Plus FR SIS: www.dupont.com/#sle.
 - 2) _____.
 - 3) _____.
 - 4) Substitutions: See Section 01 60 00 - Product Requirements.

MM. Wall Sheathing: Multi-ply, water-resistant, wood fiber laminated structural panel, coated with polymer.

1. Grade: Green.
2. Thickness: 0.078 inch.
3. Span: 24 inches, maximum.
4. Width: 48 inches.
5. Length: 96 inches.
6. Water Vapor Transmission: Pass in accordance with ASTM E96/E96M.
7. Products:
 - a. National Shelter Products, Inc; Dryline TSX: www.nationalshelter.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.

NN. Wall Sheathing and Draftstop: Nonstructural, multi-ply laminated paperboard fiber panels adhered with water-resistive barrier.

1. Thickness: 0.05 inch.
2. Span: 24 inches, maximum.
3. Width: 48 inches.
4. Length: 96 inches.
5. Water Vapor Transmission: Pass in accordance with ASTM E96/E96M.
6. Products:
 - a. National Shelter Products, Inc; Dryline Nonstructural Sheathing (Draftstop): www.nationalshelter.com/#sle.
 - b. _____.

- c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- OO. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- PP. Other Applications:
- 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
 - 2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
 - 3. Other Locations: PS 1, C-D Plugged or better.

2.09 ACCESSORIES

- A. Fasteners and Anchors:
- 1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
 - 2. Gypsum Board Screws: ASTM C1002; Type W, bugle head, self-piercing, tapping screws; length to penetrate wood members 5/8 inch minimum.
 - 3. Anchors: Toggle bolt type for anchorage to hollow masonry.
- B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
- 1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.
 - 2. Products:
 - a. _____.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
- 1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.
 - 2. Products:
 - a. _____.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Sill Gasket on Top of Foundation Wall: 3/8 inch thick, closed-cell plastic foam.
- 1. Width: 3-1/2 inches.
 - 2. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 30 days of weather exposure.
 - 3. Products:
 - a. Protecto Wrap Company; Triple Guard Energy Sill Sealer:
www.protectowrap.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Termite-Resistant Sill Plate Barrier: Self-adhesive, film-backed barrier with release sheet; adheres to concrete substrates and blocks termite access.
- 1. Thickness: 68 mil, 0.068 inch.
 - 2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
 - 3. Water Vapor Permeance: 0.035 perm, maximum, when tested in accordance with ASTM E96/E96M.
 - 4. Products:
 - a. _____.

- b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Termite-Resistant Sill Flashing: Self-adhesive membrane; polyethylene film bonded to sealant.
- 1. Thickness: 40 mil, 0.040 inch.
 - 2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
 - 3. Water Vapor Permeance: 0.035 perm, maximum, when tested in accordance with ASTM E96/E96M.
 - 4. Products:
 - a. _____.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Liquid Flashing: One-part, fast-curing, nonsag, elastomeric, gun grade, trowelable liquid flashing.
- 1. Products:
 - a. Huber Engineered Woods, LLC; ZIP System Liquid Flash: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- H. Sill Flashing: See Section 07 62 00.
- I. Subfloor Adhesives: Gap-filling construction adhesive for bonding wood structural panels to wood-based floor system framing; complying with ASTM D3498.
- 1. Products:
 - a. Adfast USA Inc; ADBOND EX 5690: www.adfastcorp.com/#sle.
 - b. Franklin International, Inc; Titebond Heavy Duty Construction Adhesive: www.titebond.com/#sle.
 - c. Franklin International, Inc; Titebond Subfloor Construction Adhesive: www.titebond.com/#sle.
 - d. Franklin International, Inc; Titebond Fast Set Polyurethane Construction Adhesive: www.titebond.com/#sle.
 - e. Huber Engineered Woods, LLC; AdvanTech Subfloor Adhesive: www.huberwood.com/#sle.
 - f. _____.
 - g. Substitutions: See Section 01 60 00 - Product Requirements.
- J. General Purpose Construction Adhesives: Comply with ASTM C557.
- 1. Products:
 - a. Franklin International, Inc; Titebond Contractor Grade Subfloor Adhesive: www.titebond.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- K. Radiant Barrier: Aluminum radiant barrier; designed for factory laminating to roof sheathing.
- 1. Products:
 - a. Louisiana-Pacific Corporation; TechShield: www.lpcorp.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- L. Rainscreen Drainage and Ventilation Mat: Three-dimensional polymer matrix with fabric facing on exterior side.

1. Water Resistance: Comply with ASTM E2556/E2556M, Type I.
 2. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less when tested in accordance with ASTM E84.
 3. Thickness: 1/4 inch.
 4. Products:
 - a. Huber Engineered Woods, LLC; ZIP System Rainscreen: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- M. Seam and Perimeter Tape: Polyethylene-faced material with acrylic adhesive.
1. Thickness: 12 mils, 0.012 inch.
 2. Products:
 - a. Huber Engineered Woods, LLC; ZIP System Flashing Tape: www.huberwood.com/#sle.
 - b. _____.
 - c. _____.
 - d. Substitutions: See Section 01 60 00 - Product Requirements.
- N. Water-Resistive Barrier: See Section 07 25 00.
- O. Water-Resistive Barrier: Plastic sheet complying with ICC-ES AC38.
- P. Vapor Retarder: See Section 07 26 00.
- Q. Air Barrier: See Section 07 27 00.
- R. Termite Shield: Galvanized sheet steel, ____ inch thick.

2.10 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWWA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
 2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWWA standards.
- B. Fire Retardant Treatment:
1. Products:
 - a. Lonza Group; ____: www.wolmanizedwood.com/#sle.
 - b. Hoover Treated Wood Products, Inc; ____: www.frtw.com/#sle.
 - c. Koppers, Inc; ____: www.koppersperformancechemicals.com/#sle.
 - d. T2EARTH, LLC; OnWood: www.t2earth.com/#sle.
 - e. UFP Industries; ProWood FR Lumber: www.ufpi.com/#sle.
 - f. Viance, LLC; D-Blaze: www.treatedwood.com/#sle.
 - g. _____.
 - h. Substitutions: See Section 01 60 00 - Product Requirements.
 2. Exterior Type: AWWA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Treat exterior rough carpentry items.
 - c. Treat exposed exterior rough carpentry items, including stairways, balconies, and covered walkways

- d. Do not use treated wood in direct contact with the ground.
 - 3. Interior Type A: AWP A U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Interior rough carpentry items are to be fire retardant treated.
 - c. Treat rough carpentry items as indicated .
 - d. Do not use treated wood in applications exposed to weather or where the wood may become wet.
- C. Preservative Treatment:
- 1. Products:
 - a. Lonza Group; ____: www.wolmanizedwood.com/#sle.
 - b. Koppers Performance Chemicals, Inc; ____: www.koppersperformancechemicals.com/#sle.
 - c. Viance, LLC; Preserve ACQ: www.treatedwood.com/#sle.
 - d. _____.
 - e. Substitutions: See Section 01 60 00 - Product Requirements.
 - 2. Preservative Pressure Treatment of Lumber Above Grade: AWP A U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
 - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - b. Treat lumber exposed to weather.
 - c. Treat lumber in contact with roofing, flashing, or waterproofing.
 - d. Treat lumber in contact with masonry or concrete.
 - e. Treat lumber less than 18 inches above grade.
 - f. Treat lumber in other locations as indicated.
 - g. Treat lumber _____.
 - 3. Preservative Pressure Treatment of Plywood Above Grade: AWP A U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
 - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
 - b. Treat plywood in contact with roofing, flashing, or waterproofing.
 - c. Treat plywood in contact with masonry or concrete.
 - d. Treat plywood less than 18 inches above grade.
 - e. Treat plywood in other locations as indicated.
 - f. Treat plywood _____.
 - 4. Preservative Pressure Treatment of Lumber in Contact with Soil: AWP A U1, Use Category UC4A, Commodity Specification A using waterborne preservative.
 - a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.
 - b. Restrictions: Do not use lumber or plywood treated with chromated copper arsenate (CCA) in exposed exterior applications subject to leaching.

PART 3 EXECUTION

3.01 PREPARATION

- A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.
- B. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.
- C. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes, AWC (WFCM) Wood Frame Construction Manual, and _____.
- E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.
- F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.
- H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.
- I. Advanced framing techniques for LEED v4 for Homes Credit:
 - 1. In exterior walls and common walls:
 - a. Install no more than one horizontal 2x top plate on walls by aligning studs with joists and roof rafters.
 - b. Place window and door headers in the rim joist.
 - c. Install raised, directly beneath the top plate, single-ply headers not more than 2 inches nominal thickness in a 2x4 wall or 4 inches nominal thickness in a 2x6 wall, in accordance with local International Residential Code.
 - d. Install structural insulated panels (SIPs) for walls.
 - 2. For interior and exterior walls:
 - a. Size headers for actual loads.
 - b. Use ladder blocking or drywall clips.
 - c. Use two-stud corners or California corners.
 - 3. Space interior wall studs greater than 16 inches o.c..
 - 4. Space floor joists greater than 16 inches o.c. or SIPs.
 - 5. Space roof rafters greater than 16 inches o.c. or SIPs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.
- C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

- D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- F. Provide the following specific nonstructural framing and blocking:
 1. Cabinets and shelf supports.
 2. Wall brackets.
 3. Handrails.
 4. Grab bars.
 5. Towel and bath accessories.
 6. Wall-mounted door stops.
 7. Chalkboards and marker boards.
 8. Wall paneling and trim.
 9. Joints of rigid wall coverings that occur between studs.
 10. _____.
 11. _____.

3.05 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.06 INSTALLATION OF CONSTRUCTION PANELS

- A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.
- B. Subflooring: Glue and nail to framing; staples are not permitted.
- C. Underlayment: Secure to subflooring with nails and glue.
 1. At locations where resilient flooring will be installed, fill and sand splits, gaps, and rough areas.
 2. Place building paper between floor underlayment and subflooring.
- D. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
 1. At long edges use sheathing clips where joints occur between roof framing members.
 2. At long edges provide solid edge blocking where joints occur between roof framing members.
 3. Nail panels to framing; staples are not permitted.
- E. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
 1. Install plywood wall sheathing in accordance with manufacturer's current ICC-ES evaluation report for specified sheathing product.
 2. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
 3. Provide inlet diagonal bracing at corners.
 4. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.
- F. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.

2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 3. Install adjacent boards without gaps.
 4. Size: 48 by 96 inches, installed horizontally at ceiling height.
 5. Size and Location: As indicated on drawings.
- G. Wall Sheathing and Roof Sheathing with Laminated Water-Resistive Barrier and Air Barrier: Secure to studs in accordance with manufacturer's installation instructions.
1. Install with laminated water-resistive and air barrier on exterior side of sheathing.
 2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
 3. Use only mechanically attached and drainable EIFS and exterior insulation with wall sheathing with laminated water-resistive and air barrier.
 4. Apply manufacturer's standard seam tape to joints between sheathing panels; use tape gun or hard rubber roller in accordance with manufacturer's installation instructions.

3.07 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.08 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- C. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.09 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements for additional requirements.
- B. Coordination of ABAA Tests and Inspections:
 1. Provide testing and inspection required by ABAA QAP.
 2. Notify in ABAA writing of schedule for air barrier work. Allow adequate time for testing and inspection.
 3. Cooperate with ABAA testing agency.
 4. Allow access to air barrier work areas and staging.
 5. Do not cover air barrier work until tested, inspected, and accepted.

3.10 CLEANING

- A. Waste Disposal: See Section 01 74 19 - Construction Waste Management and Disposal.
 1. Comply with applicable regulations.
 2. Do not burn scrap on project site.
 3. Do not burn scraps that have been pressure treated.
 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

3.11 SCHEDULES

- A. Lower Level Floor Joists: MSR Lumber.
- B. Upper Level Floor and Ceiling Joists, Rafters: Spruce-Pine-Fir, No. 2 Grade.
- C. Exposed Beams: Western Cedar, Select Structural Grade.

END OF SECTION 06 10 00