SECTION 061600 - SHEATHING

TIPS:

To view non-printing **Editor's Notes** that provide guidance for editing, click on MasterWorks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on MasterWorks/Supporting Information.

Access Product MasterSpec Sections:

<Double click here to view the list of manufacturer Sections available at ProductMasterSpec.com.>

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Parapet sheathing.
4. Composite nail base insulated roof sheathing.
5. Subflooring.

6. Underlayment.
7. Sheathing joint and penetration treatment.

B. Related Requirements:

1. [**Section 061000 "Rough Carpentry"**] [**Section 061053 "Miscellaneous Rough Carpentry"**] for plywood backing panels.
2. Section 072500 "Weather Barriers" for water-resistive barrier applied over wall sheathing.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.

1. Review air-barrier and water-resistant glass-mat gypsum sheathing requirements and installation, special details, transitions, mockups, air-leakage testing, protection, and work scheduling that covers air-barrier and water-resistant glass-mat gypsum sheathing.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. 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 plywood complies 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 plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5516.
4. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. For air-barrier and water-resistant glass-mat gypsum sheathing, include manufacturer's technical data and tested physical and performance properties of products.

B. Sustainable Design Submittals:

1. Chain-of-Custody Certificates: For certified wood products. Include statement of costs.
2. Chain-of-Custody Qualification Data: For manufacturer and vendor.
3. Product Data: For composite wood products, indicating that product contains no urea formaldehyde.
4. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
5. Laboratory Test Reports: For composite wood products, indicating compliance with requirements for low-emitting materials.
6. Product Data: For composite wood products, indicating compliance with requirements for formaldehyde emissions.

7. Product Data: For composite wood products, indicating that product contains no urea formaldehyde.
8. Product Data: For installation adhesives, indicating VOC content.
9. Laboratory Test Reports: For installation adhesives, indicating compliance with requirements for low-emitting materials.

C. Shop Drawings: For air-barrier and water-resistant glass-mat gypsum sheathing assemblies.

1. Show locations and extent of sheathing, accessories, and assemblies specific to Project conditions.
2. Include details for sheathing joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
3. Include details of interfaces with other materials that form part of air barrier.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.[**including list of ABAA-certified installers and supervisors employed by Installer, who work on Project**] [**and**] [**testing and inspecting agency**].

B. Product Certificates: From air-barrier and water-resistant glass-mat gypsum sheathing manufacturer, certifying compatibility of sheathing accessory materials with Project materials that connect to or that come in contact with the sheathing.

C. Product Test Reports: For each air-barrier and water-resistant glass-mat gypsum sheathing assembly, indicating compliance with specified requirements, for tests performed by a qualified testing agency.

D. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated plywood.
2. Fire-retardant-treated plywood.
3. Foam-plastic sheathing.
4. Air-barrier and water-resistant glass-mat gypsum sheathing.

E. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer of air-barrier and water-resistant glass-mat gypsum sheathing.

1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.

B. Mockups: Build mockups to set quality standards for materials and execution[**and for preconstruction testing**].

1. Build integrated mockups of exterior wall assembly [**as indicated on Drawings**] [**, 150 sq. ft. (14 sq. m)**] <**Insert requirement**>, incorporating backup wall construction,

window, storefront, door frame and sill, ties and other penetrations, and flashing to demonstrate crack and joint treatment and sealing of gaps, terminations, and penetrations of air-barrier sheathing assembly.

a. Coordinate construction of mockups to permit inspection and testing of sheathing before external insulation and cladding are installed.
b. Include junction with roofing membrane[**, building corner condition,**] [**and**] [**foundation wall intersection**].
c. If Architect determines mockups do not comply with requirements, reconstruct mockups until mockups are approved.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

C. Testing Agency Qualifications:

1. For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
2. For testing and inspecting agency providing tests and inspections related to air-barrier and water-resistant glass-mat gypsum sheathing: an independent agency, qualified according to ASTM E329 for testing indicated, and certified by Air Barrier Association of America, Inc.

1.7 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: [**Owner will engage**] [**Engage**] a qualified testing agency to perform preconstruction testing on field mockups.

B. Mockup Testing: Air-barrier and water-resistant glass-mat gypsum sheathing assemblies shall comply with performance requirements indicated, as evidenced by reports based on mockup testing by a qualified testing agency.

1. Air-Leakage-Location Testing: Mockups will be tested for evidence of air leakage according to [**ASTM E1186, chamber pressurization or depressurization with smoke tracers**] [**ASTM E1186, chamber depressurization with detection liquids**] <**Insert requirement**>.
2. Air-Leakage-Volume Testing: Mockups will be tested for air-leakage rate according to [**ASTM E783**] [**or**] [**ASTM E2357**].
3. Notify Architect [**seven**] <**Insert number**> days in advance of the dates and times when mockups will be tested.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

B. Air-Barrier and Water-Resistant Glass-Mat Gypsum Sheathing Performance: Air-barrier and water-resistant glass-mat gypsum sheathing assembly, and seals with adjacent construction, 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. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations[**, tie-ins to installed waterproofing**] [**, tie-ins to other installed air barriers**], and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.2 WOOD PANEL PRODUCTS

A. Emissions: Products shall meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

B. Certified Wood: The following wood products shall be certified as "FSC Pure"[**or "FSC Mixed Credit"**] according to FSC STD-01-00 and FSC STD-40-004.

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.
4. Hardboard underlayment.

C. Certified Wood: The following wood products shall be certified as "FSC Pure"[**or "FSC Mixed Credit"**] according to FSC STD-01-001 and FSC STD-40-004.

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.
4. Hardboard underlayment.

D. Certified Wood: The following wood products shall be labeled according to the AF&PA's Sustainable Forestry Initiative, be certified as "FSC Pure" according to FSC STD-01-001 and FSC STD-40-004, or be certified and labeled according to the standards of the Programme for Endorsement of Forest Certification.

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.
4. Hardboard underlayment.

E. Certified Wood: The following wood products shall [**contain not less than 60 percent**] [**be made from**] certified wood tracked through a chain-of-custody process. Certified wood documentation shall be provided by sources certified through a forest certification system with principles, criteria, and standards developed using ISO/IEC Guide 59 or the World Trade Organization's "WTO Agreement on Technical Barriers to Trade."

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.
4. Hardboard underlayment.

F. Certified Wood: The following wood products shall be certified according to the American Tree Farm System's "AFF Standard," the AF&PA's Sustainable Forestry Initiative, FSC STD-01-001 and FSC STD-40-004, or the standards of the Programme for Endorsement of Forest Certification.

1. Plywood.
2. Oriented strand board.
3. Particleboard underlayment.
4. Hardboard underlayment.

G. Thickness: As needed to comply with requirements specified, but not less than thickness indicated.

H. Factory mark panels to indicate compliance with applicable standard.

2.3 PRESERVATIVE-TREATED PLYWOOD

A. 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**].

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

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: [**Treat all plywood unless otherwise indicated**] [**Treat items indicated on Drawings**] [**and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing**].

2.4 FIRE-RETARDANT-TREATED PLYWOOD

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated 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 (3.2 m) beyond the centerline of the burners at any time during the test.

1. Use treatment that does not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D5516 and design value adjustment factors shall be calculated according to ASTM D6305. Span ratings after treatment shall be not less than span ratings specified.[**For roof sheathing and where high-temperature fire-retardant treatment is indicated, span ratings for temperatures up to 170 deg F (76 deg C) shall be not less than span ratings specified.**]

C. 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.

D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.

E. Application: [**Treat all plywood unless otherwise indicated.**] [**Treat plywood indicated on Drawings, and the following:**]

1. Roof[**and wall**] sheathing within 48 inches (1220 mm) of [**fire**] [**party**] walls.
2. Roof sheathing.
3. Subflooring and underlayment for raised platforms.
4. <**Insert category of plywood items required to be treated**>.

2.5 WALL SHEATHING

A. Plywood Sheathing: [**DOC PS 1**] [**Either DOC PS 1 or DOC PS 2**], [**Exterior, Structural I**] [**Exterior**] [**Exposure 1, Structural I**] [**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**] [**20/0**] [**24/0**] [**32/16**].
2. Nominal Thickness: Not less than [**11/32 inch (8.7 mm)**] [**3/8 inch (9.5 mm)**] [**1/2 inch (13 mm)**].

B. Oriented-Strand-Board Sheathing: DOC PS 2, [**Exposure 1, Structural I**] [**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**] [**20/0**] [**24/0**] [**24/16**] [**32/16**].
2. Nominal Thickness: Not less than [**5/16 inch (7.9 mm)**] [**3/8 inch (9.5 mm)**] [**1/2 inch (13 mm)**].

C. Paper-Surfaced Gypsum Sheathing: ASTM C1396/C1396M, gypsum sheathing; with water-resistant-treated core and with water-repellent paper bonded to core's face, back, and long edges.

1. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation USG Corporation; USG Sheetrock® Brand Gypsum Sheathing Panels or a comparable product by one of the following:

    a. American Gypsum.
    b. GP Gypsum.
    c. National Gypsum Company.
    d. Temple-Inland Building Products by Georgia-Pacific.
    e. <**Insert manufacturer's name**>.

2. Type and Thickness: [**Regular, 1/2 inch (13 mm)**] [**Type X, 5/8 inch (15.9 mm)**] thick.
3. Edge and End Configuration: [**V-shaped, tongue-and-groove long edges; square ends**] [**Square**].
4. Size: [**24 by 96 inches (610 by 2438 mm) for horizontal**] [**48 by 96 inches (1219 by 2438 mm) for vertical**] [**48 by 108 inches (1219 by 2743 mm) for vertical**] [**600 by 2400 mm for horizontal**] [**1200 by 2400 mm for vertical**] [**1200 by 2750 mm for vertical**] installation.

D. Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M.

1. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation; USG Securock® Brand Glass-Mat Sheathing or a comparable product by one of the following:

    a. CertainTeed Corporation.
    b. Continental Building Products, LLC.
    c. GP Gypsum.
    d. National Gypsum Company.
    e. Temple-Inland Building Products by Georgia-Pacific.
    f. <**Insert manufacturer's name**>.

2. Type and Thickness: [**Regular, 1/2 inch (13 mm)**] [**Type X, 5/8 inch (15.9 mm)**] thick.
3. Size: [**48 by 96 inches (1219 by 2438 mm)**] [**48 by 108 inches (1219 by 2743 mm)**] [**48 by 120 inches (1219 by 3048 mm)**] [**1200 by 2400 mm**] [**1200 by 2750 mm**] [**1200 by 3050 mm**] for vertical installation.

E. Air-Barrier and Water-Resistant Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M, Type X, coated fiberglass mat gypsum sheathing with integral weather-resistant barrier and air barrier complying with ASTM E2178.

1. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation and Tremco Incorporated; Securock® ExoAir®430 Panel or a comparable product by one of the following:

a. <**Insert manufacturer's name**>.

2. Type and Thickness: Type X, 5/8 inch (15.9 mm) thick.
3. Air and Water Resistive Coating Thickness: Minimum 20 mils (0.5 mm) dry-film thickness (DFT).
4. Size: 48 by 96 inches (1219 by 2438 mm) for vertical installation.
5. Edges: Square.
6. Flashing and Transitions Strips: As acceptable to sheathing manufacturer.
7. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference when tested according to ASTM E2178.
8. Vapor Permeance: Minimum Between 1.0 and 10 perms (57.5 and 690 ng/Pa x s x sq. m) when tested according to ASTM E96/E96M, Water Method, Procedure B.
9. Sheathing Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft. (0.2 L/s x sq. m of surface area at 75 Pa) when tested according to ASTM E2357.
10. Fire Propagation Characteristics: Complies with NFPA 285 testing as part of an approved assembly.
11. UV Resistance: Can be exposed to sunlight for [**30**] [**90**] [**180**] <**Insert number**> days according to manufacturer's written instructions.
12. Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by sheathing manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.

F. Cellulose Fiber-Reinforced Gypsum Sheathing: ASTM C1278/C1278M, gypsum sheathing.

1. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation; Fiberock Sheathing with Aqua-Tough or a comparable product by one of the following:

a. <**Insert manufacturer's name**>.

2. Type and Thickness: [**Regular, 1/2 inch (13 mm)**] [**Type X, 5/8 inch (15.9 mm)**] thick.
3. Size: [**48 by 96 inches (1219 by 2438 mm)**] [**48 by 108 inches (1219 by 2743 mm)**] [**48 by 120 inches (1219 by 3048 mm)**] [**1200 by 2400 mm**] [**1200 by 2750 mm**] [**1200 by 3050 mm**].

G. Cementitious Backer Units: ASTM C1325, Type A.

1. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation; Durock Cement Board or a comparable product by one of the following:

   a. C-Cure.
   b. Custom Building Products.
   c. FinPan, Inc.
   d. <**Insert manufacturer's name**>.

2. Thickness: [**1/2 inch (12.7 mm)**] [**5/8 inch (15.9 mm)**] [**As indicated**].

H. Fiberboard Sheathing: ASTM C208, Type IV, [**Grade 1 (Regular)**] [**Grade 2 (Structural)**] cellulosic fiberboard sheathing with square edges, [**1/2 inch (13 mm)**] [**25/32 inch (20 mm)**] thick.

I. Extruded-Polystyrene-Foam Sheathing: ASTM C578, Type IV, in manufacturer's standard lengths and widths with tongue-and-groove or shiplap long edges as standard with manufacturer.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. DiversiFoam Products.
   b. Dow Chemical Company (The).
   c. Kingspan Insulation Limited.
   d. Owens Corning.
   e. <**Insert manufacturer's name**>.

2. Thickness: [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] [**As indicated**].
3. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

J. Foil-Faced, Polyisocyanurate-Foam Sheathing: ASTM C1289, Type I or Type II, Class 2, rigid, cellular, polyisocyanurate thermal insulation. Foam-plastic core and facings shall have a flame-spread index of 25 or less when tested individually.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Atlas EPS; a Division of Atlas Roofing Corporation.
   b. Carlisle Coatings & Waterproofing Inc.
   c. Dow Chemical Company (The).
   d. Firestone Building Products.
   e. Hunter Panels.
   f. Rmax, Inc.
   g. <**Insert manufacturer's name**>.

2. Thickness: [**7/16 inch (11.1 mm)**] [**1/2 inch (13 mm)**] [**5/8 inch (15.9 mm)**] [**3/4 inch (19 mm)**] [**1 inch (25 mm)**] [**As indicated**].
3. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

2.6 ROOF SHEATHING

A. Plywood Sheathing: [**DOC PS 1**] [**Either DOC PS 1 or DOC PS 2**], [**Exterior, Structural I**] [**Exterior**] [**Exposure 1, Structural I**] [**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**] [**20/0**] [**24/0**] [**32/16**] [**40/20**] [**48/24**].
2. Nominal Thickness: Not less than [**15/32 inch (11.9 mm)**] [**1/2 inch (13 mm)**].

B. Oriented-Strand-Board Sheathing: DOC PS 2, [**Exposure 1, Structural I**] [**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**] [**20/0**] [**24/0**] [**24/16**] [**32/16**] [**40/20**] [**48/24**].
2. Nominal Thickness: Not less than [**7/16 inch (11.1 mm)**] [**15/32 inch (11.9 mm)**] [**1/2 inch (13 mm)**] [**5/8 inch (16 mm)**] [**3/4 inch (19 mm)**].

2.7 PARAPET SHEATHING

A. Plywood Sheathing: [**DOC PS 1**] [**Either DOC PS 1 or DOC PS 2**], [**Exterior, Structural I**] [**Exterior**] [**Exposure 1, Structural I**] [**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**] [**20/0**] [**24/0**] [**32/16**] [**40/20**] [**48/24**].
2. Nominal Thickness: Not less than [**15/32 inch (11.9 mm)**] [**1/2 inch (13 mm)**].

B. Oriented-Strand-Board Sheathing: DOC PS 2, [**Exposure 1, Structural I**] [**Exposure 1**] sheathing.

1. Span Rating: Not less than [**16/0**] [**20/0**] [**24/0**] [**24/16**] [**32/16**] [**40/20**] [**48/24**].
2. Nominal Thickness: Not less than [**7/16 inch (11.1 mm)**] [**15/32 inch (11.9 mm)**] [**1/2 inch (13 mm)**] [**5/8 inch (16 mm)**] [**3/4 inch (19 mm)**].

C. Glass-Mat Gypsum Sheathing: ASTM C1177/C1177M.

1. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation; USG Securock® Brand Glass-Mat Sheathing or a comparable product by one of the following:

a. CertainTeed Corporation.
b. GP Gypsum.
c. National Gypsum Company.
d. Temple-Inland Building Products by Georgia-Pacific.
e. <**Insert manufacturer's name**>.

2. Type and Thickness: [**Regular, 1/2 inch (13 mm)**] [**Type X, 5/8 inch (15.9 mm)**] thick.
3. Size: [**48 by 96 inches (1219 by 2438 mm)**] [**48 by 108 inches (1219 by 2743 mm)**] [**48 by 120 inches (1219 by 3048 mm)**] [**1200 by 2400 mm**] [**1200 by 2750 mm**] [**1200 by 3050 mm**] for vertical installation.

D. Cementitious Backer Units: ASTM C1325, Type A.

1. Basis-of-Design Product: Subject to compliance with requirements, provide USG Corporation; USG Durock Cement Board or a comparable product by one of the following:

   a. C-Cure.
   b. Custom Building Products.
   c. FinPan, Inc.
   d. <**Insert manufacturer's name**>.

2. Thickness: [**1/2 inch (12.7 mm)**] [**5/8 inch (15.9 mm)**] [**As indicated**].

2.8 COMPOSITE NAIL BASE INSULATED ROOF SHEATHING

A. Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: ASTM C1289, Type V with DOC PS 2, Exposure 1 oriented strand board on one face.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Atlas EPS; a Division of Atlas Roofing Corporation.
   b. Cornell Corporation.
   c. Dow Chemical Company (The).
   d. Hunter Panels.
   e. Johns Manville; a Berkshire Hathaway company.
   f. Rmax, Inc.
   g. <**Insert manufacturer's name**>.

2. Polyisocyanurate-Foam Thickness: [**1 inch (25 mm)**] [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] [**2-1/2 inches (64 mm)**] [**3 inches (76 mm)**] [**3-1/2 inches (89 mm)**] [**4 inches (102 mm)**].
3. Oriented-Strand-Board Nominal Thickness: [**7/16 inch (11.1 mm)**] [**5/8 inch (15.9 mm)**].

B. Vented, Oriented-Strand-Board-Surfaced, Polyisocyanurate-Foam Sheathing: ASTM C1289, Type II, Class 1, with DOC PS 2, Exposure 1 oriented strand board adhered to spacers on one face.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Atlas EPS; a Division of Atlas Roofing Corporation.
   b. Cornell Corporation.
   c. Dow Chemical Company (The).
   d. Hunter Panels.
   e. Johns Manville; a Berkshire Hathaway company.
   f. Rmax, Inc.
   g. <**Insert manufacturer's name**>.

2. Polyisocyanurate-Foam Thickness: [**1 inch (25 mm)**] [**1-1/2 inches (38 mm)**] [**2 inches (50 mm)**] [**2-1/2 inches (64 mm)**] [**3 inches (76 mm)**] [**3-1/2 inches (89 mm)**] [**4 inches (102 mm)**].
3. Oriented-Strand-Board Nominal Thickness: [**7/16 inch (11.1 mm)**] [**5/8 inch (15.9 mm)**].
4. Spacers: Wood furring strips or blocks not less than 3/4 inch (19 mm) thick and spaced not more than [**12 inches (300 mm)**] [**16 inches (400 mm)**] [**24 inches (600 mm)**] o.c.

2.9 SUBFLOORING AND UNDERLAYMENT

A. Plywood Combination Subfloor-Underlayment: DOC PS 1, [**Exterior, Structural I, C-C Plugged**] [**Exterior, C-C Plugged**] [**Exposure 1, Structural I, Underlayment**] [**Exposure 1, Underlayment**] single-floor panels.

1. Span Rating: Not less than [**16**] [**20**] [**24**] [**32**] [**48**].
2. Nominal Thickness: Not less than [**23/32 inch (18.3 mm)**] [**7/8 inch (22.2 mm)**] [**1 inch (25 mm)**].
3. Edge Detail: [**Square**] [**Tongue and groove**].
4. Surface Finish: Fully sanded face.

B. Oriented-Strand-Board Combination Subfloor-Underlayment: DOC PS 2, Exposure 1 single-floor panels.

1. Span Rating: Not less than [**16**] [**20**] [**24**] [**32**] [**48**].
2. Nominal Thickness: Not less than [**23/32 inch (18.3 mm)**] [**7/8 inch (22.2 mm)**] [**1 inch (25 mm)**].
3. Edge Detail: [**Square**] [**Tongue and groove**].
4. Surface Finish: [**Fully sanded**] [**Resin-impregnated overlay**] face.

C. Plywood Subflooring: [**DOC PS 1**] [**Either DOC PS 1 or DOC PS 2**], [**Exterior, Structural I**] [**Exterior**] [**Exposure 1, Structural I**] [**Exposure 1**] single-floor panels or sheathing.

1. Span Rating: Not less than [**16**] [**20**] [**24**] [**32**] [**48**] [**or**] [**32/16**] [**40/20**] [**48/24**].
2. Nominal Thickness: Not less than [**23/32 inch (18.3 mm)**] [**7/8 inch (22.2 mm)**] [**1 inch (25 mm)**].

D. Oriented-Strand-Board Subflooring: DOC PS 2, Exposure 1[**, Structural I sheathing**] [**single-floor panels or sheathing**].

1. Span Rating: Not less than [**16**] [**20**] [**24**] [**32**] [**48**] [**or**] [**32/16**] [**40/20**] [**48/24**] [**60/32**].
2. Nominal Thickness: Not less than [**23/32 inch (18.3 mm)**] [**7/8 inch (22.2 mm)**] [**1 inch (25 mm)**].

E. Underlayment: Provide underlayment in nominal thicknesses indicated or, if not indicated, not less than 1/4 inch (6.4 mm) over smooth subfloors and not less than 3/8 inch (9.5 mm) over board or uneven subfloors.

1. Plywood Underlayment for Resilient Flooring: DOC PS 1, [**Exterior A-C**] [**Exterior B-C**] [**Exterior, C-C Plugged**] [**Exposure 1 Underlayment**] with fully sanded face.

2. Plywood Underlayment for Ceramic Tile: DOC PS 1, Exterior, C-C Plugged, not less than 5/8-inch (15.9-mm) nominal thickness.
3. Plywood Underlayment for Carpet: DOC PS 1, [**Exterior, C-C Plugged**] [**Exposure 1, Underlayment**] [**Interior, Underlayment**].
4. Particleboard Underlayment: ANSI A208.1, [**Grade PBU**] [**Grade M-2**].

    a. Particleboard shall be made without urea formaldehyde.
    b. Particleboard shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
    c. Particleboard shall be made without urea formaldehyde.
    d. Particleboard shall have formaldehyde emission rates not greater than 0.09 ppm when tested according to ASTM D6007 or ASTME 1333.
    e. Particleboard shall be made without urea formaldehyde.

5. Hardboard Underlayment: ANSI A135.4, Class 4 (Service), Surface S1S; with back side sanded.

2.10 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For [**roof**] [**parapet**] [**and**] [**wall**] sheathing, provide fasteners [**with hot-dip zinc coating complying with ASTM A153/A153M**] [**of Type 304 stainless steel**].
2. For [**roof**] [**parapet**] [**and**] [**wall**] sheathing, provide fasteners with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Screws for Fastening Sheathing to Wood Framing: ASTM C1002.

E. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.

1. For steel framing less than 0.0329 inch (0.835 mm) thick, use screws that comply with ASTM C1002.
2. For steel framing from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick, use screws that comply with ASTM C954.

G. Screws for Fastening Composite Nail Base Insulated Roof Sheathing to Metal Roof Deck: Steel drill screws, in type and length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117. Provide washers or plates if recommended by sheathing manufacturer.

2.11 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for [**Paper-Surfaced**] [**Glass-Mat**] Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 079200 "Joint Sealants."

B. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches (50 mm) wide, 10 by 10 or 10 by 20 threads/inch (390 by 390 or 390 by 780 threads/m), of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

C. Sheathing Tape for Foam-Plastic Sheathing: Pressure-sensitive plastic tape recommended by sheathing manufacturer for sealing joints and penetrations in sheathing.

2.12 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with [**APA AFG-01**] [**ASTM D3498**] that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Adhesive shall have a VOC content of [**50**] [**70**] <**Insert value**> g/L or less.
2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
3. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
4. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." Formaldehyde emissions shall not exceed 9 mcg/cu. m or 7 ppb, whichever is less.
5. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of

Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

6. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers." The building concentration of formaldehyde shall not exceed half of the indoor recommended exposure limit, or 33 mcg/cu. m, and that of acetaldehyde shall not exceed 9 mcg/cu. m.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

D. Use common wire 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. Install fasteners without splitting wood.

E. Coordinate [**wall**] [**parapet**] [**and**] [**roof**] sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

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

B. Fastening Methods: Fasten panels as indicated below:

1. Combination Subfloor-Underlayment:

a. [**Glue and nail**] [**Nail**] to wood framing.
b. Screw to cold-formed metal framing.
c. Space panels 1/8 inch (3 mm) apart at edges and ends.

2. Subflooring:

a. [**Glue and nail**] [**Nail**] [**Nail or staple**] to wood framing.
b. Screw to cold-formed metal framing.
c. Space panels 1/8 inch (3 mm) apart at edges and ends.

3. Wall and Roof Sheathing:

a. [**Nail**] [**Nail or staple**] to wood framing.[**Apply a continuous bead of glue to framing members at edges of wall sheathing panels.**]
b. Screw to cold-formed metal framing.
c. Space panels 1/8 inch (3 mm) apart at edges and ends.

4. Underlayment:

a. [**Nail**] [**Nail or staple**] to subflooring.
b. Space panels 1/32 inch (0.8 mm) apart at edges and ends.
c. Fill and sand edge joints of underlayment receiving resilient flooring immediately before installing flooring.

3.3 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to wood framing with [**nails**] [**or**] [**screws**].
2. Fasten gypsum sheathing to cold-formed metal framing with screws.
3. Install panels with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
4. Install panels with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent panels without forcing. Abut ends over centers of studs, and stagger end joints of adjacent panels not less than one stud spacing. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of panels.

2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of panels.
2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

E. Seal sheathing joints according to sheathing manufacturer's written instructions.

1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

F. Air-Barrier and Water-Resistant Glass-Mat Gypsum Sheathing:

1. Install accessory materials according to sheathing manufacturer's written instructions and details to form a seal with adjacent construction, to seal fasteners, and ensure continuity of air and water barrier.

    a. Coordinate the installation of sheathing with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
    b. Install transition strip on roofing membrane or base flashing, so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate.

2. Connect and seal sheathing material continuously to air barriers specified under other Sections as well as to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
3. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
4. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply [**transition strip**] [**preformed silicone extrusion**], so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames, with not less than 1 inch (25 mm) of full contact.

    a. Transition Strip: Roll firmly to enhance adhesion.
    b. Preformed Silicone Extrusion: Set in full bed of silicone sealant applied to walls, frame, and air-barrier material.

5. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, and miscellaneous penetrations of sheathing material with foam sealant.
6. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
7. Seal top of through-wall flashings to sheathing with an additional 6-inch- (150-mm-) wide, transition strip.
8. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
9. Repair punctures, voids, and deficient lapped seams in strips and transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.

3.4 CEMENTITIOUS BACKER UNIT INSTALLATION

A. Install panels and treat joints according to ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.5 FIBERBOARD SHEATHING INSTALLATION

A. Comply with ASTM C846 and with manufacturer's written instructions.

B. Fasten fiberboard sheathing panels to intermediate supports and then at edges and ends. Use galvanized roofing nails[**or galvanized staples**]; comply with manufacturer's recommended spacing and referenced fastening schedule. Drive fasteners flush with surface of sheathing and locate perimeter fasteners at least 3/8 inch (9.5 mm) from edges and ends.

C. Install sheathing vertically with long edges parallel to, and centered over, studs. Install solid wood blocking where end joints do not occur over framing. Allow 1/8-inch (3-mm) open space between edges and ends of adjacent units. Stagger horizontal joints if any.

D. Cover sheathing as soon as practical after installation to prevent deterioration from wetting.

3.6 FOAM-PLASTIC SHEATHING INSTALLATION

A. Comply with manufacturer's written instructions.

B. Foam-Plastic Wall Sheathing: Install vapor-relief strips or equivalent for permitting escape of moisture vapor that otherwise would be trapped in stud cavity behind sheathing.

C. Apply sheathing tape to joints between foam-plastic sheathing panels and at items penetrating sheathing. Apply at upstanding flashing to overlap both flashing and sheathing.

3.7 PARTICLEBOARD UNDERLAYMENT INSTALLATION

A. Comply with CPA's recommendations for type of subfloor indicated. Fill and sand gouges, gaps, and chipped edges. Sand uneven joints flush.

1. Fastening Method: [**Glue and nail**] [**Nail**] [**Nail or staple**] underlayment to subflooring.

3.8 HARDBOARD UNDERLAYMENT INSTALLATION

A. Comply with CPA's recommendations and hardboard manufacturer's written instructions for preparing and applying hardboard underlayment.

1. Fastening Method: [**Nail**] [**Nail or staple**] underlayment to subflooring.

3.9 FIELD QUALITY CONTROL

A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.

B. Testing and Inspecting Agency: [**Owner will engage**] [**Engage**] a qualified testing agency to perform tests and inspections.

C. Inspections: Air-barrier and water-resistant glass-mat gypsum sheathing, accessories, and installation are subject to inspection for compliance with requirements.[**Inspections may include the following:**]

1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
2. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
3. Termination mastic has been applied on cut edges.
4. Strips and transition strips have been firmly adhered to substrate.
5. Compatible materials have been used.
6. Transitions at changes in direction and structural support at gaps have been provided.
7. Connections between assemblies (sheathing and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
8. All penetrations have been sealed.

D. Tests: As determined by testing agency from among the following tests:

1. Air-Leakage-Location Testing: Air-barrier sheathing assemblies will be tested for evidence of air leakage according to [**ASTM E1186, chamber pressurization or depressurization with smoke tracers**] [**ASTM E1186, chamber depressurization using detection liquids**] <**Insert requirement**>.
2. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to [**ASTM E783**] [**or**] [**ASTM E2357**].

E. Air barriers will be considered defective if they do not pass tests and inspections.

F. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.

G. Prepare test and inspection reports.

END OF SECTION 061600