

**SECTION 03 51 13
CEMENTITIOUS WOOD FIBER DECKS**

SPEC WRITE NOTES:

1. Delete between // // if not applicable to project.
2. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.
3. Listed by UL as structural cement-fiber units, and two manufacturers.

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Section specifies structural cement-fiber units (planks) for roof deck // and acoustical panels //.

1.2 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. All items indicated below are required submittals requiring Contracting Officer's Representative (COR) review and approval.
- B. Shop Drawings:
1. Cement-fiber unit deck installation details and anchorage.
 2. Show primary frames members and purlins with subpurlin and opening framing.
- C. Manufacturer's Literature and Data:
1. Cement-fiber units showing compliance with specifications including anchorage items and Installation instructions.
 2. Subpurling.
 3. Grout.
- D. Certificates: Stating cement-fiber units meet fire hazard classification, wind uplift requirement, and "R" values specified.
- E. Sustainable Construction Submittals:

SPEC WRITER NOTE: Retain sustainable construction submittals appropriate to product.

1. Recycled Content: Identify post-consumer and pre-consumer recycled content percentage by weight.

1.3 DELIVERY

- A. Deliver units to site labeled with manufacturer's name, brand and contents.

1.4 STORAGE

- A. Store cement-fiber units and accessories in weathertight and dry storage facility.
- B. Protect from damage from handling, water, weather, and construction operations before, during, and after installation.

1.5 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. ASTM International (ASTM):
 - A36/A36M-19.....Standard Specification for Carbon Structural Steel
 - A653/A653M-20.....Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process
 - C144-18.....Standard Specification for Aggregate for Masonry Mortar
 - C150/C150M-20.....Standard Specification for Portland Cement
 - C177-19.....Standard Test method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded Hot-Plate Apparatus
 - C423-17.....Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - C494/C494M-19.....Standard Specification for Chemical Admixtures for Concrete
 - C1289-19.....Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
 - E84-20.....Standard Test Method for Surface Burning Characteristics of Building Materials
 - E119-20.....Standard Test Methods for Fire Tests of Building Construction and Materials
 - E1264-19.....Standard Classification for Acoustical Ceiling Products
 - F1667-18a.....Standard Specification for Driven Fasteners: Nails, Spikes and Staples
- C. American Welding Society (AWS):

- D1.1/D1.1M-20.....Structural Welding Code - Steel
- D. Factory Mutual Engineering and Research Corporation (FM):
Annual issue.....Approval Guide Building Materials
- E. Underwriters Laboratories, Inc. (UL):
Annual issue.....Building Materials Directory
Annual issue.....Fire Resistance Directory
- F. Warnock Heresy (WH):
Annual issue.....Certification Listings
- G. Federal Specifications (Fed. Spec.):
FF-S-107C(2).....Screws, Tapping and Drive

SPEC WRITER NOTES:

1. Make material requirements agree with applicable requirements specified in the referenced Applicable Publications.
2. Update and specify only that which applies to the project.
3. Coordinate roof deck design with structural Engineer to show assembly required and section editing.
4. Coordinate details when units are used for acoustical panels.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C150, Type I or III.
- B. Chemical Admixtures: ASTM C494, type as required by unit manufacturer.
- C. Aggregate: ASTM C144.
- D. Wood fiber:
 1. Wood species: Unit manufacturers standard softwood.
 2. Shredded into strips; random lengths unit manufacturers standard specifications.
 3. Treated for fire resistance.
- E. Fasteners:
 1. Nails: ASTM F1667, galvanized, roof type with integral 25 mm (1-inch) washers length to provide 76 mm (1-1/2-inches) penetration into wood support, type as required by unit manufacturer.
 2. Screws: Fed. Spec FF-S-107 type as required by unit manufacturer.
 - a. Provide 25 mm (1-inch) wide washers when screw retains unit.
 - b. Provide 26 mm (1-1/2-inch) minimum penetration into wood.

SPEC WRITER NOTE: Specify physical properties of bulb tees used on project.
Design deflection: 1/360 of span.

F. Bulb-Tee Subpurlins:

1. Fabricated from ASTM A36 steel.
2. Minimum flange bearing area each side: 50 mm (1-inch).
3. Rust inhibiting paint finish, manufacturers standard.
4. Properties:
 - a. Minimum weight per 0.304 mm (lineal foot: _____ Kg (_____ pounds))
 - b. Height: _____ MM (_____ inches):
 - c. Minimum resisting moment: ____ MM (____ inch pound).
5. Length to span not less than three supports.

G. Clips and Channels:

1. Fabricated of ASTM A446 steel sheet.
2. Thickness: Minimum 1.61 mm (0.0635-inches) for channels 1.31 mm (0.0516-inch) for clips.
3. Clips:
 - a. Two piece or single piece.
 - b. Purlin anchor clamp designed to fasten to purlin and engage channel.
 - c. Channel to engage purlin anchor clamp and hold down unit in groove.
 - d. Z clamp, flange for anchoring to purlin, other flange for engaging groove.
 - e. Clips provide uplift resistance of not less than 1-1/2 N (250 pounds).
4. Channels:
 - a. Fabricated to fit tongue and groove of units.
 - b. Length to span between purlins with continuous span over three or more purlins, ends over purlin supports.

H. Water: Clean and potable, free from imparities detrimental to grout.

I. Grout Mix:

1. Portland Cement aggregate water and admixture in proportions required by unit manufacture.
2. Mix in mechanically operated mortar mixer. Minimum 3 minutes, Maximum 5 minutes.
3. Mix to pouring consistency.

2.2 STRUCTURAL CEMENT-FIBER UNITS

- A. Labeled for fire resistance by FM, UL, or WH.

1. Flame spread: Maximum 25.
 2. Smoke Developed: Not laminated to other products; maximum 5.
 3. Tested per ASTM E84.
- B. Manufacture planks from treated wood fibers and portland cement, bonded under pressure.
- C. Having following properties:
1. Long edges tongue and groove. // Provide rebated edges at bulb tee bearing flange use.
 2. Ends square unless shown otherwise.
 3. Plank length to span two supports except for end fillers or bulb tee supports.
 4. Thermal Resistance:
 - a. Test in accordance with ASTM C177.
 - b. "R" value: // 38 mm (1-1/2-inches) thick 2.63, //.
 - 51 mm (2-inches) thick, 3.5, //.
 - 64 mm (2-1/2-inches) thick, 4.38, // and //.
 - 76 mm (3-inches) thick, 5.25 //.
 - c. // R" value _____ insulation layer over units. //
 5. Noise Reduction Coefficient (NRC):
 - a. Tested in accordance with ASTM C423.
 - b. NRC Not less than: // 38 mm (1-1/2-inches) thick, 0.55 //.
 - 51 mm (2-inches) thick 0.60 //.
 - 64 mm (2-1/2-inches) thick 0.60 // and //
 - 6 mm (3-inches) thick 0.65 //.

SPEC WRITER NOTE: Do not use units with insulation bonded to units where vapor retarder is required on insulation joint line. Use R of 5.56 per 25.4 mm (inch) for calculating thickness of insulation.
 6. Factory bond ASTM C1289 layer of polyisocyanurate insulation to top plank.
 - a. Thickness of insulation as shown.
 - b. Top of insulation faced with glass fiber felt.

SPEC WRITER NOTES:

 1. Verify details. Show system selected and applicable components of system.
 2. Check manufacturer's literature for available thicknesses required to suit span and live load, and corresponding "R" value, NRC, subpurlin and channel size, where applicable.

3. Design system for not less than 1/240, preferred 1/360, deflection.
4. Design system for wind uplift in accordance with FM 1-28.
5. Structural Engineer to design roof system.
6. Support edges and ends of units at openings greater than 200 mm (8-inches).
7. Size depth of bulb tees for not less than 13 mm (1/2-inch) grout over top of bulb and flush with surface of unit.

PART 3 - EXECUTION

3.1 INSTALLATION

A. //Bulb tees:

1. Place bulb tees at spacing shown, aligned and straight.
2. Weld bulb tees to primary framing as shown. //

B. Plank Installation:

1. Do not use broken or cracked units.
2. Cut planks to fit tight at perimeter, vertical surfaces, projections, // openings // ridges // valleys //.
3. Bear edges and ends of planks and at perimeter of openings greater than 200 mm (8-inches) on framing members, // and bearing walls // not less 25 mm (1-inch).

4. Installing Units:

- a. Lay continuous units progressively with side joints (edges) tightly butted and with end joints in adjacent rows staggered. Install with tongue leading.
- b. Nail or screw units to bearing surface. Space fasteners at 125 mm (5-inches) between edge or corner fasteners. Unless specified otherwise.
- c. Weld clips to steel joists or beam; engaging clip into groom of units.
- d. Install fasteners as unit is layed. Do not walk on unfastened units.
- e. Lay units with edges bearing not less than 25 mm (1-inch) on bottom flange of bulb tees.
- f. Grout bulb tee joints with units to finish flush with top of units.

- C. Install barrier, full depth of plank // plus insulation //, over top of sound rated partitions // of exterior wall // as shown. //
- D. Replace damaged or defective units with new undamaged units prior to placing roofing.

3.2 PROTECTION

- A. Provide planking or plywood to distribute weight and support heavy material placed or transported over the roof deck.

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