Designation: C 956 – 04

Standard Specification for Installation of Cast-In-Place Reinforced Gypsum Concrete[1]

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1. Scope

1.1 This specification covers the minimum requirements for the installation of cast-in-place reinforced gypsum concrete over permanent formboard.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered requirements of the standard.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement

A 185 Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

A 568 Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

A 653/A 653M Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

C 11 Terminology Relating to Gypsum and Related Building Materials and Systems

C 317 Specification for Gypsum Concrete

C 726 Specification for Mineral Fiber Roof Insulation Board

E 72 Test Methods of Conducting Strength Tests of Panels for Building Construction

2.2 *American Concrete Institute Standard:*

ACI 318 Building Code Requirements for Reinforced Concrete[3]

2.3 *American Welding Society Standard:*

D1.1 Structural Welding Code Steel[4]

3. Terminology

3.1 Definitions shall be in accordance with Terminology C 11.

3.2 *Definitions:*

3.2.1 *primary framing, n*—structural members provided to support the reinforced gypsum concrete roof deck assembly.

3.2.1.1 *purlin, n*—a secondary structural member that spans the primary framing members and provides support for subpurlins.

3.2.2 *subpurlin, n*—a steel member applied transversely to the primary framing and purlins to support the formboards and to transmit the dead and live loads from the gypsum concrete slab to the primary framing.

3.2.2.1 *bulb tee, n*—a subpurlin, hot-rolled formed steel, rail-shaped section.

3.2.2.2 *truss tee, n*—a subpurlin fabricated from steel wire and strip, tee-shaped section.

3.2.3 *cross tee, n*—a steel tee-shaped section used to support a formboard end at right angles to the subpurlins where a formboard end does not occur over the purlin or primary framing.

3.2.4 *formboard, n*—sheet material used as a permanent form to support the gypsum concrete.

3.2.5 *reinforcement, n*—steel wire mesh or fabric used within the gypsum concrete slab to provide longitudinal and transverse strength.

3.2.6 *double-pouring, n*—the application of gypsum concrete in more than one layer to complete the full slab thickness. See 8.7.4.3.

3.2.7 *ribbon-pouring or strip-pouring, n*—the application of narrow ribbons of gypsum concrete, about 10 to 12 in. (254 to

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from the American Concrete Institute, P.O. Box 19150, Detroit, MI 48219.

[4] Available from the American Welding Society, 550 N.W. La Jeune Rd., P.O. Box 351040, Miami, FL 33135.

305 mm) wide by 1 to 1½ in. (25.4 to 38.1 mm) deep, across the width of the formboard at center of span between purlins.

4. Delivery of Materials

4.1 Materials shall be delivered in original packages, containers, or bundles bearing the brand name and name of producer or seller. Bulk materials shall be delivered with the brand name and name of the producer or seller shown on the accompanying bills of lading.

5. Storage of Materials

5.1 All materials shall be stored in a manner that prevents damage before use. When stored under tarpaulins, ventilation shall be provided to prevent moisture accumulation under the tarpaulin.

5.2 Formboard shall be stored flat and off the ground. Handling and stacking shall be done in such a manner to prevent damage to face, ends, and edges and keep dry until use.

5.3 When it is necessary to store gypsum concrete at the job site, the gypsum concrete shall be stored off the ground and kept dry until use.

6. Environmental Conditions

6.1 The minimum temperature at which gypsum concrete is mixed and placed is not specified. Gypsum concrete shall not be mixed with water containing ice crystals.

NOTE 1—An exothermic reaction during setting ensures complete hydration before freezing.

7. Materials

7.1 *Subpurlins*:

7.1.1 Subpurlins shall be designed to support live and dead loads of the roof deck.

7.1.2 Hot-rolled and cold-rolled steel shapes other than bulb tees or truss tees shall meet the requirements of this specification for subpurlins.

7.2 *Cross Tees*, shall be not less than 1¼ in. (31.75 mm) wide by ½ in. (12.7 mm) high, fabricated from not less than 26 gage zinc-coated steel conforming to Specifications A 653/A 653M or A 568.

7.3 *Formboard*:

7.3.1 *Mineral Fiber Formboard*, Specification C 726, not less than ¾ in. (19.0 mm) thick nor more than 3 in. (76 mm) thick. It shall sustain a uniform load of 20 lb/ft^2(97 kg/m^2).

7.3.1.1 Mineral fiber formboard shall be tested in accordance with the transverse loading test of Test Methods E 72.

7.3.1.2 The test specimen shall be uniformly loaded and supported at both edges and ends. The test specimens shall be supported at the perimeter with a frame providing 1 in. (25.4 mm) bearing on ends and ½ in. (12.7 mm) bearing on edges and 7 in. (177.8 mm) nominal clearance from the bed of the apparatus.

7.3.1.3 For formboards ¾ in. (19.0 mm) thick, test specimens shall be 48 in. (1200 mm) long by 24 in. (600 mm) wide.

7.3.1.4 For formboards 1 in. (25.4 mm) thick or greater, test specimens shall be 48 in. (1200 mm) long by 32 in. (800 mm) wide.

7.4 *Reinforcement*, Specification A 82, shall be fabricated from zinc-coated (galvanized) welded or woven steel wire mesh or fabric having an effective cross-sectional area of not less than 0.026 in.^{2} (16.77 mm)^2 per foot of slab width. Reinforcement shall be free of rust, scale, or other materials that reduce bond to the gypsum concrete.

7.4.1 *Hexagonal Reinforcing Mesh*, shall be fabricated from 2 in. (50.8 mm) hexagonal mesh formed of not less than 0.0410 in. (1.04 mm) diameter wires with longitudinal wires not less than 0.0625 in. (1.59 mm) in diameter, spaced not more than 3 in. (76.2 mm) on centers. Steel wire for fabricating wire mesh and fabric—Specification A 82.

7.4.2 *Rectangular Reinforcing Fabric*, Specification A 185, shall be fabricated from longitudinal wires not less than 0.1055 in. (2.68 mm) in diameter spaced not more than 4 in. (102 mm) on centers and transverse wires not less than 0.0800 in. (2.03 mm) in diameter spaced not more than 8 in. (203 mm) on centers.

7.5 *Gypsum Concrete*, Specification C 317, Class A.

7.6 *Water*, shall be potable and free of substances that could adversely affect the gypsum concrete.

7.7 *Expansion Filler Strip*, shall be not less than ¾ in. (19 mm) thick and equal in height to the abutting gypsum concrete and of the type specified by the producer of the gypsum concrete.

8. Installation

8.1 *Installation of Subpurlins*:

8.1.1 *Installation, Normal*:

8.1.1.1 *Subpurlins*—The subpurlins shall be placed transversely to the purlins and primary framing and shall be spaced to suit the size of the formboards specified. Subpurlins shall be of sufficient length so that their joints occur over purlins or primary framing. Subpurlin joints shall be alternated so that the joints are staggered one purlin space.

8.1.1.2 Subpurlins shall be welded to purlins and steel primary framing with ⅛ in. (3.2 mm) fillet welds not less than ½ in. (12.7 mm) long on alternate sides of the subpurlin at each intersection with purlins. Except as otherwise specified, welding shall be in accordance with AWS D1.1. Where primary framing is of wood, nails not less than 16d shall be used on each side of the subpurlins at each intersection. The nails shall be bent over approximately ¾ in. (19 mm) to securely clinch the flange of the subpurlin.

8.1.2 *Installation Seismic*:

8.1.2.1 *Subpurlins*—The subpurlins shall be welded at each intersection with the purlins with ⅛-in. (3.2-mm) fillet welds not less than 1 in. (25.4 mm) long, on one side. Both sides of the subpurlin shall be welded with ⅛-in. fillet welds not less than 2 in. (50.8 mm) long where subpurlin joints occur over the purlin. Both sides of the subpurlin shall be welded with ⅛-in. fillet welds not less than 2 in. long at shear transfer points and at intersections with exterior frame.

8.1.3 *Maximum Spans*—Refer to X2.1.3.

8.2 *Cross Tees*—Cross tees shall be provided where formboard ends are supported by purlins or the primary framing.

8.3 *Formboards*—Formboards shall be located face down on the flanges of the supporting members and with the ends on top of the purlins.

8.3.1 Gypsum concrete shall not be poured over formboards which have been wetted by rain or snow.

8.3.2 The gypsum concrete shall be poured on the same day the formboards are installed.

8.4 *Reinforcement*—The mesh of wire fabric shall be located with the main longitudinal wires at right angles to the subpurlins and adjacent to the formboard at midspan between the purlins. Ends of the reinforcement shall be lapped not less than 4 in. (102 mm) or one mesh, whichever is greater.

8.4.1 Edges shall be butted, not lapped, unless required for fire rated or horizontal diaphragm construction. Reinforcement shall be cut to fit at walls, curbs, and openings, folded over on to itself, and extended into all areas when gypsum concrete is to be placed.

8.5 *Expansion Filler Strips*—Expansion filler strips shall be placed continuously against the walls, curbs, nailers, or other rigid surfaces that gypsum concrete will abut.

8.6 *Expansion Joints*—Expansion joints shall be located at expansion joints found in the main structure, at a maximum of 200 ft (61 m) on center in a direction parallel to the subpurlins on large buildings, at intersections of wings on L-, U-, T-, and H-shaped buildings and, wherever the roof framing changes direction. See X1.5.5.

8.7 *Gypsum Concrete Mixing and Placement*:

8.7.1 *General*—All equipment, including mixers, pumps, hoses, tools, and screeds shall be kept clean and free of set gypsum concrete throughout the placement operation.

8.7.2 *Proportioning*—The ratio of water to gypsum concrete shall be that specified by the producer of the gypsum concrete; additional water is prohibited. Volumetric or metering devices shall be used to ensure accurate measurement.

8.7.3 *Mixing*—Mixing shall be thorough but not overmixed. The slurry shall be discharged into placement equipment immediately after completion of mixing to avoid buildup of set material.

8.7.3.1 Calcium chloride or other admixtures shall not be added to the gypsum concrete.

8.7.4 *Placement*:

8.7.4.1 *General*—To avoid exposure to inclement weather and physical abuse, gypsum concrete shall be placed the same day as the installation of the formboard and reinforcement materials.

8.7.4.1.1 The deck shall be poured in sections of similar size.

8.7.4.2 *Screeds Grounds*—Screeds, such as metal bars or wood strips, shall be spaced approximately 10 ft (3050 mm) apart at right angles on top of the subpurlins at a height that will allow the gypsum concrete slurry to be leveled at the specified thickness.

8.7.4.2.1 Gypsum concrete cants, curbs, and drainage slopes shall be placed to the design thickness. Curbs around openings shall be permitted to be formed with the formboard.

8.7.4.3 The gypsum concrete shall be discharged into placement equipment immediately after completion of mixing.

8.7.4.3.1 The slurry shall be poured or discharged not more than 24 in. (600 mm) off the formboard to minimize impact and allowed to build to full thickness in one continuous operation. Double pouring shall not be permitted.

8.7.4.3.2 As soon as the slurry has stiffened enough to hold a full level, it shall be screeded to a true, even surface using a smooth, rigid straight-edge.

8.7.4.4 Place gypsum concrete cants, curbs, and drainage slopes to the design thickness. Curbs around openings shall be permitted to be formed with the formboard.

8.8 *Roof Overhangs*—Gypsum concrete shall not be placed on roof overhangs, eaves, or other similar locations, on formboards unless the underside is protected against direct wetting by a suitable facia drip cap overhang.

8.9 *Drying*—Construction moisture shall be removed from the building to permit drying of completed gypsum concrete slab, providing heat and ventilation where required. See X1.3.

8.10 *Protection of Completed Slab*—Gypsum concrete is not a finished traffic or weather protective surface. The top side of the completed gypsum concrete slab shall be protected with a permanent waterproof covering.

9. Keywords

9.1 calculation of diaphragm shear; gypsum concrete; gypsum roof deck

APPENDIXES

(Nonmandatory Information)

X1. GENERAL INFORMATION

X1.1 Limitations of Use

X1.1.1 *Roof Shapes and Designs*—Gypsum roof decks meeting this specification can be installed on flat, warped, sawtooth, curved, or pitched roofs.

NOTE X1.1—On flat roofs, a minimum pitch of ⅛ in./ft (10.4 mm/m) is recommended.

X1.1.2 *Moisture Exposure*—Cast-in-place gypsum concrete is not recommended for general use in occupancies where it may be exposed to sustained relative humidity greater than 90 % or condensing moisture. The producer of the gypsum concrete should be consulted regarding limitations of use in high humidity occupancies.

X1.1.3 *Temperature Exposures*—Where intermittent or extended exposures to high temperatures are to be expected, such as in slabs directly exposed to radiant heat over furnace

breachings, the gypsum concrete producer should be consulted for specific recommendations.

X1.1.4 *Acid Fumes*—If acid fumes are to be encountered, the producer of the gypsum concrete should be consulted for his specific recommendations.

X1.1.5 *Surface Protection*—Gypsum concrete decks shall not be used as a finished surface to bear traffic or other loads. Protective permanent waterproof coverings shall be installed as soon as possible after completion of the slab.

X1.1.6 *Welding Precautions*—Except as modified in the body of this specification, welding shall be in accordance with AWS D1.1. Welding will not be permitted when the temperature is lower than 0°F (−18°C), when steel surfaces are wet, or under other conditions not recommended by the American Welding Society.

X1.2 Support for Suspended Ceilings

X1.2.1 Suspended ceilings should be hung from the primary framing. Ceilings may be hung from the subpurlins. A design check shall be made in accordance with applicable building codes and regulations to verify that the structural adequacy of the subpurlins and the added weight of the ceiling will not cause the subpurlins to deflect more than that allowed by the roof deck or ceiling sign or that allowed by subpurlin design. Hangers should not be fastened into or through the gypsum concrete slab or the formboards. Similar precautions should be followed for the suspension of unit heaters, light troffers, and piping.

X1.3 Drying of Slabs

X1.3.1 Subsequent to the placing of gypsum concrete, ventilation accompanied by heat is recommended below the slabs to remove the excess construction moisture resulting from the slab pouring, placement of concrete floors, masonry plastering, and other similar construction work. Where natural ventilation is inadequate, mechanical ventilation is required to remove construction moisture from the building. When suspended ceilings are installed below the slabs, provisions should be made to permanently vent the enclosed space below the deck, particularly that space above a suspended ceiling, using sufficient gravity or mechanical ventilation to remove all construction moisture and excessive moisture vapor resulting from subsequent occupancy.

X1.4 Provisions for Expansion and Contraction

X1.4.1 Provision for relief of expansion and contraction should be considered for all cast-in-place roof decks. Wherever expansion joints have been provided in the main structure, they must also be provided in the roof deck and roof covering. The use of suitable expansion strips at the junction between roof slabs and parapets is recommended for further relief of expansion and contraction stresses in the slabs. Where subpurlins are used, edge expansion strips need be used only at walls where subpurlins abut walls at right angles.

X1.5 Roof Coverings

X1.5.1 Built-up or other suitable roof coverings should be specified over poured gypsum concrete roof slabs.

X1.5.2 The application of metal or other rigid types of roof covering over poured gypsum concrete decks is not generally recommended. If sheet metal roof coverings are required over portions of a poured gypsum concrete deck, their anchoring members must be attached either by the use of toggle bolts passing entirely through the slab and formboards or by suitable fastening to the primary members. Where shingle-type roof coverings are contemplated, the gypsum concrete producer's recommendations for attachment should be followed.

X1.5.3 Provisions for furnishing and installing roof sumps should be included in other sections of the specification.

X1.5.4 The application of roof covering should follow as promptly after the placing of gypsum concrete as possible. The top surface of the slab should be reasonably hard as indicated by the disappearance of visible moisture gloss from its surface.

X1.5.5 Expansion joints should be installed in the roofing wherever they are provided in the gypsum concrete and the main structure.

X1.6 Painting Undersides of Gypsum Concrete Roof Decks

X1.6.1 The underside of the gypsum deck is usually not further decorated. If painting is desired, it should be deferred until the formboard and the slab are thoroughly dry through their total thickness.

X1.7 Framing Requirements

X1.7.1 The primary framing to receive subpurlins and the primary framing spaced to directly receive the formboards for the gypsum concrete are not part of the gypsum concrete specifications. However, it is essential that the following provisions regarding such framing be incorporated in other sections.

X1.7.1.1 Spacing of primary structural supports to receive the subpurlins of the reinforced gypsum concrete assembly must be such that design stresses in the specified subpurlins are not exceeded.

X1.7.1.2 When subpurlins are not used, the following provisions should be made to anchor the slab to the primary framing members to resist uplift forces and movements due to temperature changes.

X1.7.1.2.1 Weld steel tee sections sized from 1 by 1 by ⅛ in. (25.4 by 25.4 by 3.2 mm) to 1½ by 1½ by 3⁄16 in. (38.1 by 38.1 by 4.7 mm) across the joists at approximately 32 in. (812.8 mm) to 48 in. (1219 mm) on center depending on type of formboard used. The reinforcing mat must then be wire tied to these tee sections.

X1.7.1.2.2 Wiring of formboard to the frame as a means of providing uplift resistance is not permissible.

X1.7.1.3 Heavy concentrated loads, such as water tanks, large fan bases, cooling towers, and flag poles, must not be imposed directly on the poured gypsum concrete roof deck. Details must provide for transmitting such loads directly to the walls, primary framing or structural supports.

X1.7.1.4 The architect or engineer should assign by specification the responsibility for furnishing and installing of roof nailers and for framing at openings and expansion joints, eaves and wall angles, and similar special items.

X1.7.1.5 It is important that the gypsum concrete roof deck be designed with sufficient slope to provide adequate drainage and eliminate the possibility of free-standing water.

X1.8 Evaluation and Inspection

X1.8.1 Metal framing members should be of the sizes specified and have a factory applied coating to prevent rust.

X1.8.1.1 Welds should meet the requirements of AWS D1.1 and be correctly located and of the size specified.

X1.8.2 Formboards should be of the type, size, and thickness specified and should be free of damage rendering them unfit for their intended use.

X1.8.3 Reinforcement should have main longitudinal strands laid at right angles to subpurlins and near formboard at midspan.

X1.8.3.1 Edges should be butted. Edges should not be lapped unless required for fire rated or horizontal diaphragm construction.

X1.8.3.2 Ends should be lapped a minimum of 4 in. (101.6 mm). At slab edges, the fabric should be folded back to provide greater bond within the slab.

X1.8.4 Top surface of the gypsum concrete slab should be smooth and free of any protrusions.

X2. DESIGN

X2.1 General

X2.1.1 Reinforced gypsum concrete shall be designed to support the anticipated loads and to withstand the forces to which they may be subjected without exceeding the allowable stresses specified in X2.1.1.1. Except as otherwise specified, methods of design shall follow established principles of mechanics and principles of design for reinforced concrete in accordance with ACI 318.X2. The minimum ratio of area of reinforcement to area of portland cement concrete for shrinkage and temperature shall not apply to gypsum concrete.

X2.1.1.1 *Allowable Stresses*—not more than:

Compressive stress in bending	0.25 f_g(Note X2.1)
Axial compressive or bearing stress	0.20 f_g(Note X2.1)
Bond stress (plain reinforced bars)	0.02 f_g(Notes X2.1 and X2.2)
Bond stress (for deformed reinforced bars or electrically welded mesh)	0.03 f_g(Note X2.1)
Shear stress	0.02 f_g(Notes X2.1 and X2.2)

NOTE X2.1—f_g indicates the compressive strength of the gypsum concrete as determined in accordance with the requirements of Specification C 317, Class A.

NOTE X2.2—Gypsum concrete meets the bond and shear requirements of this section when reinforced with steel wire reinforcement conforming to the requirements of 7.4.

X2.1.2 *Minimum Thickness*—Not less than 2 in. (50.8 mm) measured at all points over the top surface of the formboard.

X2.1.3 *Maximum Spans*—Not more than 31 in. (787 mm) between supports when using subpurlins and formboards.

X2.1.4 *Maximum Spacing of Supports*—Not more than 36 in. (914 mm) for gypsum concrete slabs over formboards applied directly to primary framing members.

X2.2 *Seismic and Wind Conditions*—Where the gypsum concrete roof deck is used as a horizontal diaphragm to transmit seismic or wind loads, the subpurlins shall be installed in accordance with 9.1.2.

X2.2.1 *Diaphragm Shear*—Determine shear in poured gypsum concrete diaphragms as follows:

$$Q_e = [0.16\, f_g t C_1 + 1000\, (k_1 d_1 + k_2 d_2)] C_2 C_3 \quad \text{(X2.1)}$$

$$Q_m = [0.0000133\, f_g t C_1 + 0.175\, (k_1 d_1 + k_2 d_2)] C_2 C_3 \quad \text{(X2.2)}$$

where:

- Q_e = allowable shear on diaphragm in lb per linear ft which includes a one-third increase for short-term loading,
- Q_m = allowable shear on diaphragm in kN·m which includes a one-third increase for short-term loading,
- f_g = oven-dry compressive strength of gypsum in lbf/in.^{2}(kPa) as determined by tests conforming to this specification,
- C_1 = 1.0 for Class A gypsum concrete,
- t = thickness of gypsum concrete between subpurlins in inches (mm). For the purpose of computing diaphragm shear values, t shall be not more than 4 in. (101.6 mm),
- k_1 = number of mesh wires per ft (wires per m) passing over subpurlins,
- d_1 = diameter of mesh wires passing over subpurlins in inches (mm) except hexagonal mesh,
- k_2 = number of mesh wires per foot (wires per metre) parallel to subpurlins or 0.7 times the number of hexagonal wires,
- d_2 = diameter in inches of mesh wires parallel to subpurlins or of hexagonal wires,
- C_2 = 1.4 for Class A gypsum concrete using the truss tee and 1.0 for bulb tee, and
- C_3 = 0.85 for perlited gypsum concrete, 1.0 for gypsum concrete made with wood chips or wood shavings.

The allowable shear values are shown in Tables X2.1 and X2.2.

NOTE X2.3—k_1 = X2.5 for 2 in. (50.8 mm) hexagonal mesh woven of No. 19 gage galvanized wire with additional longitudinal No. 16 gage galvanized wires spaced every 3 in. (75.8 mm) across the width of the mesh.

TABLE X2.1 Allowable Shear Values in Pounds per Foot Using Truss or Bulb Tee Subpurlins[A]

Perlited Gypsum Concrete—Class A (500 psi)							
Concrete Thickness, in.	Truss Tee Subpurlins, Mesh Type			Bulb Tee Subpurlins, Mesh Type			
	Galvanized			Galvanized			
	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal	
2	718	831	878	513	593	627	
2.5	765	878	926	547	627	661	
3	813	926	974	581	661	695	
3.5	860	973	1021	615	695	729	
4	908	1021	1069	649	729	763	
Wood Chips or Wood Shavings Gypsum Concrete—Class A (500 psi)							
Concrete Thickness, in.	Truss Tee Subpurlins, Mesh Type			Bulb Tee Subpurlins, Mesh Type			Shear Values[B]
	Galvanized			Galvanized			
	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal	
2	844	977	1033	603	698	738	840
2.5	900	1033	1089	643	738	778	
3	956	1089	1145	683	778	818	
3.5	1012	1145	1201	723	818	858	
4	1068	1201	1257	763	858	898	

[A] The tabulated shear values are for short-term loads due to wind or earthquake forces and are not permitted a one-third increase for duration of load.

[B] Recommended shear transfer provided such truss tees are embedded not less than ⅜ in. (9.5 mm) deep in gypsum concrete and are welded to the structural frame with not less than ⅛ in. (3.2 mm) fillet welds not less than 1½ in. (38.1 mm) long at 6 in. (152.4 mm) on centers both sides bottom flanges and the mesh is tied to top flange of such subpurlins.

TABLE X2.2 Allowable Shear Values in kiloNewtons per Meter Using Truss or Bulb Tee Subpurlins (Metric)[A]

Perlited Gypsum Concrete—Class A (3450 kPa)						
Concrete Thickness, mm	Truss Tee Subpurlins, Mesh Type			Bulb Tee Subpurlins, Mesh Type		
	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal
50.8	10.5	12.1	12.8	7.47	8.65	9.15
63.5	11.2	12.8	13.5	7.97	9.15	9.64
76.2	11.8	13.5	14.2	8.46	9.64	10.1
88.9	12.5	14.2	14.9	8.96	10.1	10.6
101.6	13.2	14.9	15.6	9.45	10.6	11.1
Wood Chips or Wood Shavings Gypsum Concrete—Class A (3450 kPa)						
Concrete Thickness, mm	Truss Tee Subpurlins, Mesh Type			BulbTeeSubpurlins,MeshType			Shear Values[B]
	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal	4 × 8 #12 × #14	6 × 6 #10 × #10	Hexagonal	
50.8	12.3	14.2	15.1	8.79	10.2	10.8	12.3
63.5	13.1	15.1	15.9	9.37	10.8	11.3	
76.2	13.9	15.9	16.7	9.96	11.3	11.9	
88.9	14.8	16.7	17.5	10.5	11.9	12.5	
101.6	15.6	17.5	18.3	11.1	12.5	13.1	

[A] The tabulated shear values are for short-term loads due to wind or earthquake forces and are not permitted a one-third increase for duration of load.

[B] Recommended shear transfer provided such truss tees are embedded not less than 9.5 mm (⅜ in.) deep in gypsum concrete and are welded to the structural frame with not less than 3.2 mm (⅛ in.) fillet welds not less than 38.1 mm (1½ in.) long at 152.4 mm (6 in.) on centers both sides bottom flanges and the mesh is tied to top flange of such subpurlins.