

1. **Beam** — W8 x 24, min size.

2. **Roof Covering*** — Consisting of hot mopped or cold application materials compatible with insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Roof Covering Materials.

2A. **In lieu of item 1, roof covering consisting of single-ply Roofing Membrane*** — that is either ballasted, adhered or mechanically attached as permitted under the respective manufacturer's Classification. See Fire Resistance Directory-Roofing Membranes (CHCI).

3. **Insulating Concrete** — various types of insulating concrete prepared as indicated below:

A. **Vermiculite Concrete** — 6 cu ft of Vermiculite Aggregate* to 94 lbs. of Portland cement and 1-1/2 pts. of air entraining agent.

ELASTIZELL CORP OF AMERICA

SIPLAST INC

VERMICULITE PRODUCTS INC

B. **Cellular Concrete — Roof Topping Mixture*** — concentrate mixed with water and Portland cement per manufacturers specifications. Cast dry density and 28-day min compressive strength of 190 psi as determined with ASTM C495-66. A 1/8 in. min slurry coat of cellular concrete, as measured to the top of the steel form unit corrugations, shall be employed. The cellular concrete topping thickness above foamed plastic, shall be 2 in. min.

CELCORE INC — Cast dry density of 31 (+ or -) 3.0 pcf.

ELASTIZELL CORP OF AMERICA — Type II. Mix #1 of cast dry density 39 (+ or -) 3.0 pcf, Mix #2 of cast dry density 40 (+ or -) 3.0 pcf, Mix #3 of cast dry density 47 (+ or -) 3.0 pcf.

CELLULAR CONCRETE L L C — Cast dry density 37 (+ or -) 3.0 pcf.

LITE-CRETE INC — Cast dry density of 29 (+ or -) 3.0 pcf.

SIPLAST INC — Mix #2. Cast dry density of 36 (+ or -) 3.0 pcf.

C. **Perlite Concrete** — Mix consists of 6 cu ft of Perlite Aggregate* to 94 lb of Portland cement and 1-1/2 pints of air entraining agent.

See **Perlite Aggregate** (CFFX) category in Fire Resistance Directory for names of Classified companies.

D. **Cellular Concrete — Roof Topping Mixture*** — Foam Concentrate mixed with water, Portland Cement and UL Classified Vermiculite Aggregate per manufacturer's application instructions. Cast dry density of 33 (+ or -) 3.0 pcf and 28-day compressive strength of min 250 psi as determined in accordance with ASTM C495-86.

A 1/8 in. min slurry coat shall be employed below the foamed plastic (Item 4). The cellular concrete topping thickness, above the foamed plastic, shall be 2 in. min.

SIPLAST INC — Mix #3.

CELLULAR CONCRETE L L C — Mix #3.

4. **Foamed Plastic*** — **For vermiculite concrete applications** — Foamed plastic insulation boards with holes and/or slots. Nom size 24 by 48 in. of thickness specified below.

SIPLAST INC — Thickness 1 in. to 8 in.

VERMICULITE PRODUCTS INC

4A. Foamed Plastic* — Nom 24 by 48 in., 48 by 48 in. or 30 by 60 in. by max 8 in. thick polystyrene foamed plastic insulation boards with holes symmetrically placed having a max density of 2.0 pcf. For use only with cellular concrete roof topping mixture.

STARRFOAM MFG INC

4B. Foamed Plastic* — Nom 24 by 48 by max 8 in. thick polystyrene foamed plastic insulation boards having a density of 1.0 (+ or -) 0.1 pcf, encapsulated within cellular concrete topping (Item 3B). Each board shall contain six nom 3 in. diam holes oriented in two rows of three holes each with the holes spaced 12 in. OC transversely and 16 in. OC longitudinally.

See **Foamed Plastic* (BRYX)** category in Building Materials Directory or **Foamed Plastic* (CCVW)** category in Fire Resistance Directory for list of manufacturers.

5. Wire Mesh — No. 19 SWG galv steel twisted to form 2 in. hexagons. In addition, straight 16 SWG galv steel woven into mesh and spaced 3 in. apart for stiffness. Mesh installed without attachment perpendicular to supports and overlapped 6 in. at the sides. As an alternate, 4 x 8-12/14 SWG or 2x2-14/14 SWG welded wire fabric may be used. The wire mesh may be omitted if the steel roof deck (Item 6) is not loaded to more than 75 percent of its bending capacity.

5A. Fiber Reinforcement* — (Optional) - For use only with Roof-Topping Mixtures* manufactured by Cellular Concrete LLC. In lieu of Wire Mesh (Item 5), Fiber Reinforcement may be added to roof topping mixtures (Items 3B or 3D), provided that the steel roof deck (Item 6) is loaded not more than 75 percent of its bending capacity. See Fiber Reinforcement (CBXQ) Category for rate that fibers are added to roof topping mixture.

FORTA CORP — Types Econo-Mono, Mighty-Mono, Stucco-Bond, Econo-Net, Cast-Master, Super-Net, Ultra-Net.

6. Steel Roof Deck (Unclassified) — Noncomposite design, min. 0.023 in. thick (24 gauge), 1-5/16 in. deep galv corrugated steel form units, nom 34 in. wide. Welded to steel joists with 3/8 in. puddle welds 15 in. O.C. Adjacent units overlapped one corrugation at the sides and a min of 3 in. at the ends. Or

Classified Steel Floor and Form Units* — Noncomposite design, 1-15/16 in. deep, nom 30 to 36 in. wide, galv corrugated steel deck. When the wire mesh (Item 5) is not used, the max total load on the steel roof deck shall not exceed 75 percent of its allowable bending capacity. Min 0.019 in. thick (26 gauge) units for joist spacing up to 4 ft OC. Min 0.023 in. thick (24 gauge) units for joist spacing greater than 4 ft up to max 5 ft OC. Welded to steel joists with 3/8 in. puddle welds 15 in. OC. Adjacent units overlapped one corrugation at the sides and a min of 3 in. at the ends.

CONSOLIDATED SYSTEMS INC — Consoliform and Comvent Types EHD, SD.

7. Steel Joists — Type 10J4 or 12K3, min size, spaced 48 in. O.C. and welded to end supports. Joist spacing may be increased to 5 ft, 0 in. O.C. under special conditions as specified in Item 6.

8. Bridging — Steel bars, 1/2 in. diam welded to top and bottom chords of each joist.

9. Hanger Wire — No. 12 SWG galv steel wire, twist-tied to lower chord of joists or cold-rolled steel channels. Located 48 in. O.C. along main runners, at all four corners of light fixtures, at midspan of cross tees adjacent to light fixtures, and at the cut end of cross tees longer than 23 in. which abut walls.

10. Cold Rolled Channels — Min 0.053 in. thick (16 gauge) painted cold-rolled steel channels, 1-1/2 in. deep with 9/16 in. flanges. Two channels tied face to face (box like section) with 12 SWG galv steel wire midway between joists. Welded or wire-tied to top of joists' bottom chord. Channels spaced as required to provide attachment provision for ceiling hanger wires.

11. **Air Duct** — Min 0.023 in. thick (24 gauge) galv steel. Total area of duct openings not to exceed 144 sq in. per each 100 sq ft of ceiling area. Area of individual duct opening not to exceed 144 sq in. Max dimension of opening 12 in. Duct supported by 1-1/1 in. deep, min 0.053 in. thick (16 gauge) cold-rolled steel channels suspended by 12 SWG galv steel wire. Duct support channels located 6 in. from and on each side of duct drop and max 48 in. O.C. away from duct drop.

12. **Damper** — Min 0.070 in. thick (14 gauge) galv steel, sized to overlap duct opening 2 in. min. Protected on both sides with 1/16 in. thick ceramic fiber paper laminated to the steel and held open with a **Fusible Link** (Bearing the UL Listing Mark).

13. **Fixtures, Recessed Light** — (Bearing the UL Listing Mark). Fluorescent lamp type, steel housing, 2 by 4 ft size, provided with detachable spring-loaded trim flange or with adjustable mounting brackets. Fixtures spaced so their area does not exceed 24 sq ft per 100 sq ft of ceiling area. Wired in conformance with the National Electrical Code.

14. **Fixture Protection — Gypsum Board*** — 5/8 in. thick, cut from the same gypsum wallboard used in the remainder of the ceiling membrane (See Item 17). The five sided enclosure consists of a 24 by 48 in. top piece, two 4-1/2 (or wider) by 48 in. side pieces, two 6 (or wider) by 24 in. end pieces, and two 6 by 6 in. spacers to maintain a 5/8 in. clearance between the light fixture housing and the top piece. The spacers are placed on top of the fixture housing, with care taken not to locate the spacers over the light fixture ballasts. The top and side pieces are laid in place, and the end pieces are secured to the edges of the side and end pieces with 6d nails at each corner. When fixtures are installed end to end, no end pieces are used where the fixtures abut. Instead, a 6 by 24 in. piece is placed on top of and centered over the gap between the top pieces.

15. **Steel Framing Members*** — Main runners nom 12 ft long spaced 48 in O.C. Cross tees nom 4 ft long installed perpendicular to main runners and spaced 24 in. O.C. Additional cross tees located 8 in. from and on both sides of each wallboard end joint and each recessed light fixture.

BPB AMERICA INC — Types PDWH, PDWS. The main runner ends may be riveted to the wall molding along one wall and the cross tee ends may be riveted to the wall molding along both adjacent walls. The rivets are intended to facilitate the ceiling installation, not to replace hanger wires .

CHICAGO METALLIC CORP — Types 650, 650C, 670, 670C. The main runner ends may be riveted to the wall molding along one wall and the cross tee ends may be riveted to the wall molding along both adjacent walls. The rivets are intended to facilitate the ceiling installation, not to replace hanger wires.

15A. **Alternate Steel Framing Members (Not Shown)** — Main runners, cross tees, cross channels and wall angle as listed below:

a. **Main Runners** — Nom 10 or 12 ft. long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft.OC.

b. **Cross Tees** — Nom 4 ft. long, 1-1/2 in. wide face or 15/16 in. wide face installed at sides of light fixtures, installed perpendicular to the main runners, spaced 24 in. OC. When Batts and Blankets* (Item 20) are used, cross tees spaced 16 in. OC. Additional cross tees or cross channels used at 8 in. from each side of butted wallboard end joints. The cross tees or cross channels may be riveted or screw attached to the wall angle or channel to facilitate the ceiling installation.

c. **Cross Channels** — Nom 4 ft. long, installed perpendicular to main runners, spaced 24 in. OC. When Batts and Blankets* (Item 20) are used, cross channels spaced 16 in. OC.

d. **Wall Angle or Channel** — Painted or galv steel angle with 1 in. legs or channel with 1 in. legs, 1-9/16 in. deep attached to walls at perimeter of ceiling with fasteners 16 in. OC. To support steel framing member ends and for screw-attachment of the gypsum wallboard.

CGC INTERIORS, DIV OF CGC INC — Type DGL or RX.

USG INTERIORS INC — Type DGL or RX.

15B. Steel Framing Members* — (Not shown) — As an alternate to Items 15 and 15A. Main runners nom 12 ft long, spaced 48 in. OC. Ends of main runners at walls to rest on wall angle, without attachment, with 1/2 to 3/4 in. end clearance. Primary cross tees (1-1/2 in. wide across flange) or cross channels, nom 4 ft long, installed perpendicular to main runners and spaced 24 in. OC. Additional primary cross tees or cross channels required at each wallboard end joint, 8 in. from and on each side of wallboard end joint, and 8 in. from each side of light fixtures. Secondary cross tees (15/16 in. wide across flange), nom 4 ft long, installed at sides of light fixtures.

ARMSTRONG WORLD INDUSTRIES INC — Type DFR-8000.

16. Wall Molding — (Not shown) — Min 0.019 in. thick painted or galv steel channel, 1-11/16 in. deep with 15/16 in. flanges, nailed to walls along perimeter of ceiling with 8d nails spaced 16 in. OC.

17. Gypsum Board* — 5/8 in. thick, 4 ft wide; installed with long dimension perpendicular to cross tees with end joints centered along cross tees and with side joints centered along main runners. Wallboard fastened to each cross tee with five wallboard screws (Item 18) with one screw located at the midspan of the cross tee, one screw located 12 in. from and on each side of the cross tee midspan and one screw located 1-1/2 in. from each wallboard side joint. Except at wallboard end joints, wallboard screws shall be located on alternating sides of cross tee flange. At wallboard end joints, wallboard screws shall be located 1/2 in. from the joint. Wallboard fastened to main runners with wallboard screws, 3/8 to 1/2 in. from side joints, midway between intersections with cross tees (24 in. OC). End joints of adjacent wallboard sheets shall be staggered not less than 4 ft OC. Wallboard sheets screw-attached to flange of wall channel with wallboard screws spaced 12 in. OC.

AMERICAN GYPSUM CO — Types AG-C, AGX-10, AGX-C.

BPB AMERICA INC — Type FRPC, SF3 or ProRoc Type C.

BPB CANADA INC — ProRoc Type C.

CANADIAN GYPSUM COMPANY — Type C.

G-P GYPSUM CORP, SUB OF GEORGIA-PACIFIC CORP — Types 5, C.

LAFARGE NORTH AMERICA INC — Types LGFC3, LGFC-C, LGFC-C/A.

NATIONAL GYPSUM CO — Types FSK-C, FSW-C, FSW-G.

PABCO GYPSUM, DIV OF PACIFIC COAST BUILDING PRODUCTS INC — Type C, PG-3 or PG-C.

STANDARD GYPSUM L L C — Type SG-C or SGC-G.

TEMPLE-INLAND FOREST PRODUCTS CORP — Type TP-5.

UNITED STATES GYPSUM CO — Type C.

USG MEXICO S A DE C V — Type C.

17A. Gypsum Board* — For use when **Batts and Blankets*** (Item 20) and **Steel Framing Members*** (Item 15A) are used - 5/8 in. thick, 4 ft wide; installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Fastened to cross tees with 1 in. long steel wallboard screws spaced 8 in. OC in the field and 8 in. OC along end joints. Fastened to main runners with 1 in. long wallboard screws spaced midway between cross tees. Screws along sides and ends of boards spaced 3/8 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing between joints on adjacent boards not less than 4 ft OC.

CANADIAN GYPSUM COMPANY — Type C.

UNITED STATES GYPSUM CO — Type C.

USG MEXICO S A DE C V — Type C.

18. **Screw, Gypsum Board** — No. 6 Phillips-type, Type S self-drilling and self-tapping, 1 in. long. Screw heads may be either exposed or covered with joint cement.

19. **Alternate Finishing System** — (Not shown) — Wallboard joints may be either exposed or covered with paper tape and joint compound. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of the Classified gypsum wallboard.

19A. **Alternate Finishing System — Acoustical Material** — * — (Not shown) — Optional, acoustical tile may be laminated to the entire surface of the Classified gypsum wallboard.

Any Manufacturer — Any UL Classified acoustical material and adhesive with a flame spread of 25 or less (See Building Materials Directory).

20. **Batts and Blankets*** — Optional - Not Shown - When used ratings are limited to 1 Hr. - For use with **Steel Framing Members*** (specifically Item 15A) and **Gypsum Board*** (specifically Item 17A) - Any thickness mineral wool or glass fiber insulation bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over steel framing members/gypsum wallboard ceiling membrane.

*Bearing the UL Classification Mark

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