

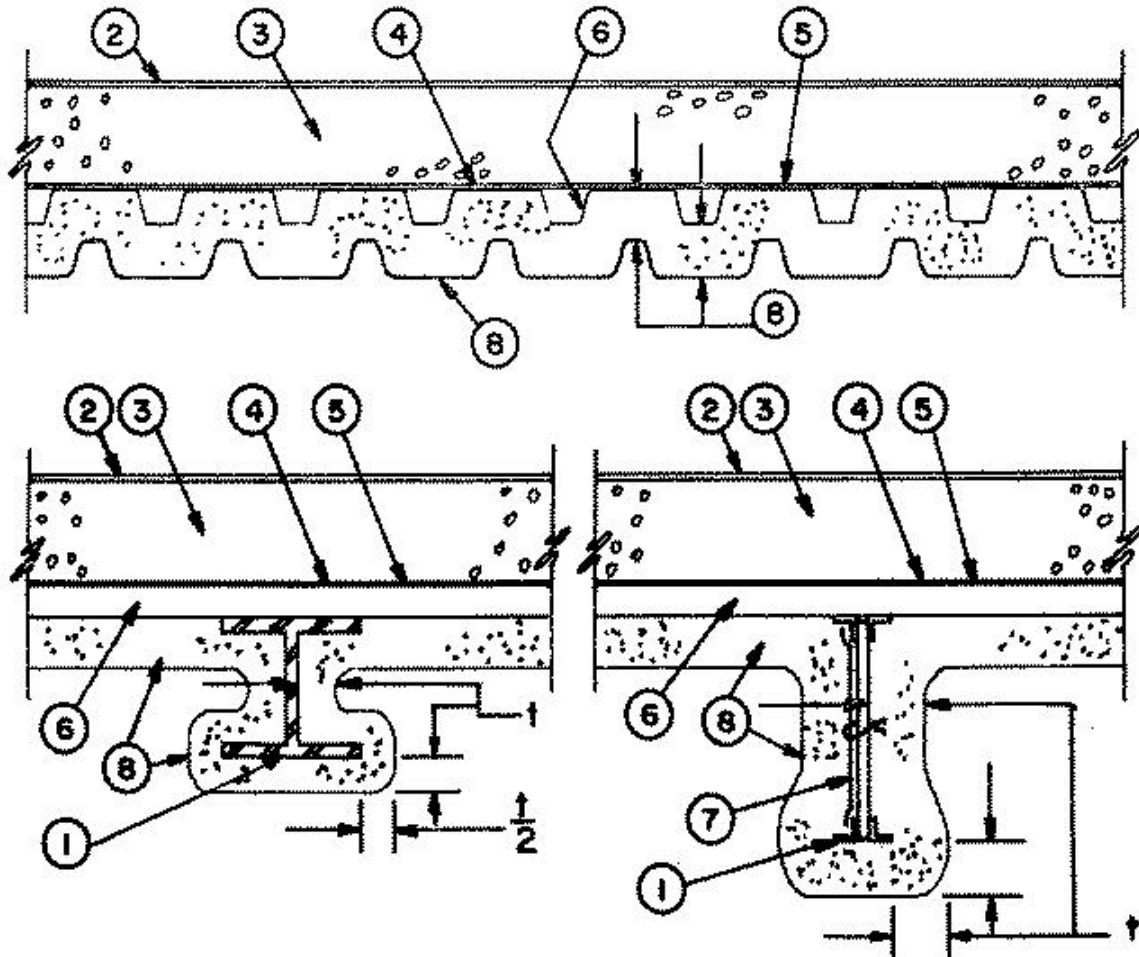
Design No. P713

May 01, 2003

Restrained Assembly Rating — 1,1-1/2,2,3 Hrs. (See Item 8)

Unrestrained Assembly Rating — 1,1-1/2,2,3 Hrs. (See Item 8)

Unrestrained Beam Rating — 1,1-1/2,2,3 Hrs. (See Item 8)



1. **Steel Beam or Bar Joist** — W6X16, W8X28 or 10H4 min size, respectively. Bar joists may be used for 1, 1-1/2 and 2 H ratings only.

NOTE: Design load shall stress joists to a max tensile stress of 25,000 psi.

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 (TEVT).

2A. **In lieu of Item 2, 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).

2B. **Metal Roof Deck Panels*** — (Not Shown) — In addition to or in lieu of Items 2 or 2A, the roof covering may consist of a mechanically fastened metal roof deck panel assembly. See Fire Resistance Directory — Metal Roof Deck Panels (CETW).

3. Roof Insulation —

A. Gypsum Board* and Foamed Plastic* — 5/8 in. thick, 2.2 psf min density wallboard installed perpendicular to steel roof deck with end joints staggered and located over crests of roof deck. Secured to the deck with Adhesive* applied at a rate of 0.4 gal/100 sq ft of deck area. And, polystyrene foamed plastic boards 1 to 8 in. thick of 2.5 pcf max density, secured to wallboard with asphalt glaze coat or adhesive. (Note: Adhesive and/or asphalt glaze coat may be omitted when the single-ply membrane with mechanical fasteners is used).

See Gypsum Board (CKNX) category for companies which produce Classified wallboard for use in this design. See Adhesive (BYWR) category for companies which produce Classified adhesive for use in this design.

See Foamed Plastic (BYRX) category in the Building Materials Directory or Foamed Plastic (CCVW) category in the Fire Resistance Directory for companies which produce Classified Polystyrene foamed plastic for use in this design.

B. Mineral and Fiber Board* — (Alternate to Item 3A — For 2 H or less ratings). — Applied in one or more layers with adhesive applied between each layer and to vapor retarder or deck if vapor retarder is not used. When more than one layer is required, joints of adjacent layers are staggered 6 in. min. Min thickness is 1 in., max thickness 3-1/2 in.

NOTE: For 2 h rating, fiber thickness on deck must be increased to 2-1/4 in. when this insulation is used.

BMCA INSULATION PRODUCTS INC — Permalite.

GAF MATERIALS CORP — GAFTEMP Perlite.

JOHNS MANVILLE INTERNATIONAL INC

C. Gypsum Board* and Foamed Plastic* — (Alternate to Items 3A and 3B — For ratings up to 2 H)-5/8 in. thick, 2.2 psf min density wallboard installed perpendicular to steel roof deck with end joints staggered and located over crests of roof deck. Secured to deck with Adhesive (Item 4 or 4A) and polyisocyanurate foamed plastic boards, 36 by 48 in. min size, applied in one or more layers. Min thickness 1 in. (No limit on max overall thickness). Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. When applied in more than one layer, each layer to be offset in both directions from layer below a min of 6 in. in order to lap all joints.

APACHE PRODUCTS CO — Pyrox.

ATLAS ROOFING CORP — AC Foam II, AC Foam III.

BPB AMERICA INC — Types L, O.

CARLISLE SYNTEC INCORPORATED — Types HP, HP-H, HP-N, HP-W.

FIRESTONE BUILDING PRODUCTS CO, DIV OF BFS DIVERSIFIED PRODUCTS L L C — "ISO 95+FK", "ISO 95+GL", "ISO 95+GRF", "ISO 95+GW", "ISO 300".

GAF MATERIALS CORP — Isotherm R.

HUNTER PANELS — H Shield.

JOHNS MANVILLE INTERNATIONAL INC — ENRGY 2, ENRGY 3, ISO-1, PSI 25.

LOADMASTER SYSTEMS INC — Loadmaster Polyisocyanurate Insulation.

RMAX INC — Multi-Max FA, Multi-Max FA-3.

STEVENS ROOFING SYSTEMS, DIV OF JPS ELASTOMERICS CORP — "Stevens ISO 2000" , "Stevens ISO 3000" .

D. Gypsum Board* and Foamed Plastic* — (Alternate to Items 3A through 3C — For ratings up to 2 H)-5/8 in. thick, 2.2 psf min density wallboard installed perpendicular to steel roof deck with end joints staggered and located over crests of roof deck. Secured to deck with Adhesive (Item 4), applied at a rate of 0.4 gal/100 sq ft of deck area; and polyisocyanurate foamed plastic boards, 36 by 48 in. min size, with formed channels on the top side and a flat bottom applied in one layer. Min thickness (as measured at thinnest section of board is 1 in.). No limit on max thickness (as measured a thickest section of board). Insulation covered with field applied 3/8 in. thick nonveneer APA rated sheathing for use with Class A or C asphalt glass-mat or asphalt organic shingles. Sheathing installed with all joints offset min 6 in. from joints of insulation boards.

GAF MATERIALS CORP — INSUL-AIR

JOHNS MANVILLE INTERNATIONAL INC — Type ISO-VENT

E. Gypsum Board* and Building Units* — (Aternate to Items 3A through 3D — For ratings up to 2 H) — 5/8 in. thick, 2.2 psf min density wallboard installed perpendicular to steel roof deck with end joints staggered and located over crests of roof deck. Secured to deck with Adhesive (Item 4), applied at a rate of 0.4 gal/100 sq ft of deck area and Building Units* — Polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with oriented strand board. Min thickness of the polyisocyanurate core is 1.0 in. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.

3A. Building Units* — Not Shown — (Alternate to Items 3A through 3C — For ratings up to 2 H)-5/8 in. thick, 2.2 psf min density wallboard installed perpendicular to steel floor deck with end joints staggered and located over crests of roof deck. Secured to deck with Adhesive (Item 4), applied at a rate of 0.4 gal/100 sq ft of deck area and composite polyisocyanurate foamed plastic insulation board with an adhered nailing surface, nom 36 by 48 in. min size, may be used with the following limitations. These composite building units have ventilation slots internal to the panels. The thickness of the panel depends upon the thinnest portion of the polyisocyanurate insulation. The following dimensions apply to the polyisocyanurate insulation, min 1 in. thick. There is no limit on the max insulation thickness.

GAF MATERIALS CORP — Type INSUL-AIR.

JOHNS MANVILLE INTERNATIONAL INC — Type ISO-VENT.

4. Adhesive* — Optional — Used with vapor retarder and roof insulation. Applied in nom 1/2 in. wide ribbons at a rate of 0.4 gal/100 sq ft. In lieu of adhesive, the first layer of roof insulation may be secured with asphalt to crest surface of steel roof deck at a rate of 12 to 15 lbs/100 sq ft, or with mechanical fasteners (described under Item 2C).

See **Adhesives (BYWR)** category for names of manufacturers.

4A. Adhesive* -(Optional) — (Bearing the UL Classification Marking for Roof Systems (TGFU)) - When FAST 100 adhesive is used, the Unrestrained Assembly ratings are limited to 1, 1-1/2 and 2 hr. The vapor retarder, the gypsum wallboard or the first layer of roof insulation may be secured with adhesive to the steel crest surfaces. Also used to attach the vapor retarder to

gypsum wallboard, the first layer of insulation to vapor retarder or gypsum wallboard and each additional layer of insulation. Applied at a max rate of 19.8 g/ft². When FAST 100 adhesive is used, additional **Spray-Applied Fire Resistance Materials* (CHPX)** is required on the deck for the 1-1/2 and 2 hr Unrestrained Assembly Ratings. The thickness specified for the deck shall be increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating.

CARLISLE SYNTEC INCORPORATED — FAST 100

5. Vapor Retarder — Sheathing Material* — Optional — Applied with adhesive to steel deck, overlapped approx 2 in. at sides.

See **Sheathing Material (CHIZ)** category for names of manufacturers.

5A. Alternate Roof System — (Not shown. Alternate to Items 2 through 5) - 5/8 in. thick, 2.2 psf min density wallboard. Placed on top of and perpendicular to the steel deck (Item 6) with end joints staggered and located over crests of roof deck. Attached to steel deck with adhesive or hot asphalt and covered with built-up roof covering (Item 2A). Rigid polystyrene foamed plastic boards 1 to 8 in. thick may be bonded to roof covering or installed without adhesion after final glaze coat has cooled. Covered with crushed stone or concrete pavers at a rate of 10 psf, min.

6. Steel Roof Deck — (Unclassified) — Min 1-1/2 in. deep, 24 in. wide, galv, fluted steel deck. Min gauge is No. 22 MSG. Flutes approx 6 in. OC, crests approx 3-1/2 in. wide. Attached to supports with welds spaced 12 in. OC. Adjacent units button-punched or welded together at side joints.

Classified Steel Floor and Form Units — Non composite 1-1/2 or 3 in. deep, 24, 30 or 36 in. wide galv. units-min. gauge is No. 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports at deck laps at a max of 12 in. OC between sides of units. Side laps of adjacent units welded, button punched or secured together with No. 12 by 3/4 in. long self-drilling, self-tapping steel screws spaced a max of 36 in. OC.

CONSOLIDATED SYSTEMS INC — Types B, BI, F, N, NI. Units may be phos/ptd.

7. Metal Lath — Optional — Diamond mesh, 3/8 in. expanded steel weighing 1.7 to 3.4 lbs/sq yd. Secured to one side of joist with No. 16 SWG steel tie wire located at about midheight of every web.

7A. Glass Fiber Mesh — As an alternate to metal lath (Item 7) on steel joists. Mastic coated fabric weighing approx 1.9 oz/sq yd, fastened to one side of steel joist. Attachment of mesh to joist must be sufficient to hold it and the sprayed material in place during spraying and until the material has cured. One method of attaching the mesh is by 1-1/4 in. long by 1/2 in. wide hairpin clips made from No. 18 SWG or heavier steel wire, attached to each web of the joist.

8. Spray-Applied Fire Resistive Materials* — See table below for appropriate thicknesses. Prepared by mixing with water and spraying in one or more coats to steel surfaces which must be clean and free of dirt, loose scale and oil. Min avg density of 16.2 pcf with min ind density of 15.5 pcf. For method of density determination refer to Design Information Section.

Restrained & Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Spray Applied Fire Resistive Mtl Thk In. on Beam +			
		on Deck*	W6x16	W8x28	on Joist
1	1	1-3/16# or 1-5/16##, ###	3/4	5/8	1-1/2
1-1/2	1-1/2	1-5/8#, ##, ###	1	7/8	2-1/4
2	2	1-7/8#, ## or 2-1/4###	1-1/4	1-1/8	2-3/8
3	3	2-1/4#, ###	1-13/16	1-11/16	NR

*The required minimum thickness of Spray-Applied Fire Resistive Materials on the steel deck is increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating when Item 4A is used.

+Thickness at bottom flange tips of beams may be reduced to 1/2 the contour thickness (t/2) but not less than 3/8 in.

#Thickness applies when Gypsum Board and polystyrene foamed plastic insulation (Item 3A) is used.

##Thickness applies when Gypsum Board and polyisocyanurate or phenolic foamed plastic insulations (Item 3C) are used.

###Thickness applies when mineral and fiber boards insulation (Item 3B) is used.

NR-No Rating.

Spray-Applied Fire Resistive Materials shall be applied to both sides of joist following the contour of the chords and webs and oversprayed onto metal lath (when lath is used) to cover the lath surface.

CIL GROUP LTD — Type 280.

ISOLATEK INTERNATIONAL — Type 280.

*Bearing the UL Classification Mark

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