

**Design No. P723**

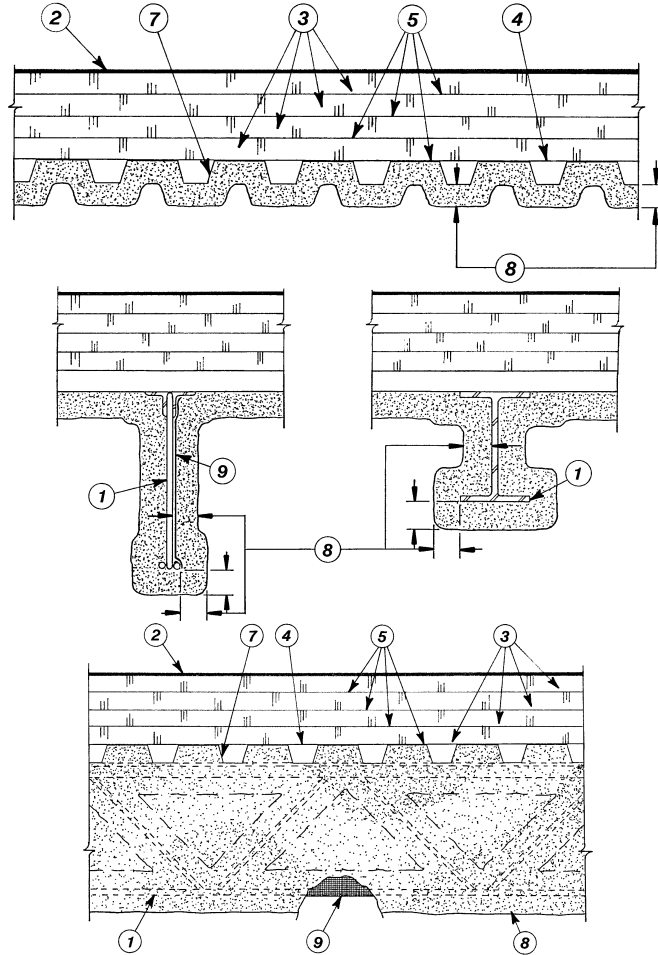
**Restrained Assembly Ratings** — 1, 1-1/2, 2 and 3 Hr  
(See Items 3 and 8)

**Unrestrained Assembly Ratings** — 1, 1-1/2, 2 and 3 Hr  
(See Items 3 and 8)

**Unrestrained Beam Ratings** — 1, 1-1/2, 2 and 3 Hr.  
(See Items 3 and 8)

**Restricted Load Condition** — See Item 8

**Load Restricted for Canadian Applications** — See Guide BXUV7



1. **Steel Supports** — W6x16 steel beam, 10K1 or 12K5 steel joists min size (See Item 8).
2. **Roof Covering** — Consisting of hot mopped or cold application bituminous materials compatible with the 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 Membranes\*** — that is either ballasted, adhered or mechanically attached as permitted under the respective manufacturer's Classification. See Roofing Membranes (CHCI) category for names of manufacturers.
- 2B. **Metal Roof Deck Panels** — (Not Shown) — In addition to or in lieu of items 2 or 2A, the Roof Covering may consist of mechanically fastened metal roof deck panel assembly. See Fire Resistance Directory — Metal Roof Deck Panels (CETW).
3. **Roof Insulation — Foamed Plastics\*** — 36 by 48 in. (min size) polyisocyanurate foamed plastic insulation boards applied in one or more layers. Min thickness is 2.0 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. Polyisocyanurate foamed plastic insulation may be installed over a max 1 in. thick layer of Mineral and Fiber Boards\* (Item 3B) with each layer offset in both directions as described above.

**ATLAS ROOFING CORP** —ACFoam II, ACFoam III, ACFoam-II SL, ACFoam IV.

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

**DOW ROOFING SYSTEMS L L C** —"Dow Termico Polyisocyanurate Insulation", "Dow Termico ISO 3000 Insulation", "Dow Termico ISO HP-FR".

**FIRESTONE BUILDING PRODUCTS CO L L C** —"ISO 95+ GL", "ISO 95+ FK", "ISO 95+ GW", "ISO 300", "ISO 95+ CAN", "ISOGARD HD Composite Board" or "RESISTA".

**GAF MATERIALS CORP** —EnergyGuard RH, Tapered EnergyGuard RH

**GAF MATERIALS CORP** —Isotherm R.

**GENFLEX ROOFING SYSTEMS L L C** — "GenFlex ISO"

**HUNTER PANELS** —H Shield.

**JOHNS MANVILLE** —ENRGY 3 25 PSI

**LOADMASTER SYSTEMS INC** —Loadmaster Polyisocyanurate Insulation.

**RMAX OPERATING L L C** —Multi-Max-3, Multi-Max FA-3, Ultra-Max, Ultra-Max Plus, Tapered Ultra-Max Plus, Tapered Thermarof-3, Tapered Thermarof FA-3, Tapered Ultra-Max.

**SIKA SARNAFIL INC** —Sarnatherm r, Sarnatherm r Ultra, Sarnatherm r Tapered, Sarnatherm r Ultra Tapered.

**SOPREMA INC** —Colgrip, SOPRA-ISO s, SOPRA-ISO s Tapered, SOPRA-ISO PLUS s, SOPRA-ISO PLUS s Tapered, SOPRA-ISO H PLUS s and SOPRA-ISO H PLUS s Tapered.

- 3A. **Roof Insulation — Mineral and Fiber Boards\*** — (Not Shown) For 1, 1-1/2 and 2 h Ratings— As an alternate to Item 3. To be applied in one or more layers with or without adhesive applied between vapor barrier and roof deck units, vapor barrier and board and each layer of board. When more than one layer is required, each layer of board to be offset in both directions from layer below a min of 6 in. in order to lap all joints. Min thickness is 2 in. when Item 2A is used. When installed as a base layer for Item 3 (polyisocyanurate roof insulation) max thickness is 1 in.  
**BMCA INSULATION PRODUCTS INC** —Permalite.  
**GAF MATERIALS CORP** —GAFTEMP Perlite.  
**JOHNS MANVILLE**
- 3B. **Building Units\*** — (Not Shown) — As an alternate to Items 3 and 3A. Polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with oriented strand board or plywood. For the building units, min thickness (as measured at core) of the polyisocyanurate foamed plastic insulation is 2.0 in. (No limit on max thickness). Building units to be installed with end joints staggered a min 6 in. in adjacent rows.  
**ATLAS ROOFING CORP** —ACFoam NailBase Insulation, Vented-R, CrossVent.  
**FIRESTONE BUILDING PRODUCTS CO L L C** —Hailgard.  
**JOHNS MANVILLE** —Nailboard.  
**SOPREMA INC** —SOPRA-ISO B s
- 3C. **Building Units\*** — As an alternate to Items 3 through 3B, polyisocyanurate foamed plastic insulation boards faced on the underside with wood fiber board. Min thickness of the polyisocyanurate core is 2.0 in. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.  
**FIRESTONE BUILDING PRODUCTS CO L L C** —“ISO 95+ Wood Fiberboard Composite” .  
**JOHNS MANVILLE** —ENRGY 2 Plus.
- 3D. **Building Units\*** — As an alternate to Items 3 through 3C, polyisocyanurate foamed plastic insulation boards faced on the underside (or both sides) with mineral fiber board. Min thickness of the polyisocyanurate core is 2.0 in. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.  
**FIRESTONE BUILDING PRODUCTS CO L L C** —“ISO 95+ Composite” .  
**JOHNS MANVILLE** —Fesco-Foam.
- 3E. **Building Units\*** — Not Shown — As an alternate to Items 3 and 3D, composite polyisocyanurate foamed plastic insulation board with an adhered nailing surface, nom 48 by 48 or 96 in. 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 2 in. thick. May be installed over a max 1 in. thick layer of mineral and fiber boards (Item 3B) with joints offset a min of 6 in., in each direction. There is no limit on the max insulation thickness.  
**JOHNS MANVILLE** —Type ISO-VENT.
- 3F. **Building units\*** — As an alternate to Items 3 through 3E, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with gypsum board. Min thickness of the polyisocyanurate core is 2.0 in. No limit on overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.  
**JOHNS MANVILLE** —ENRGY 2 Gypsum Composite.
- 3G. **Foamed Plastic\*** — Optional - (Not Shown) - Maximum 1 in. thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.  
**FIRESTONE BUILDING PRODUCTS CO L L C** —“ISOGARD HD”
- 3H. **Foamed Plastic\*** — As an alternate to Items 3 through 3G — Polyurethane foamed plastic roof insulation. Formed by the simultaneous spraying of two liquid components applied over the gypsum wallboard (item 3I) in accordance with the manufacturer's instructions. Minimum nominal thickness is 2.0 in. with no maximum thickness .  
**BASF CORP** —Types FE 303 2.7, FE-348, FE348-2.5, FE348-2.7, FE348-2.8, FE348-3.0, ELASTOSPRAY 81255, ELASTOSPRAY 81275, ELASTOSPRAY 81285 or ELASTOSPRAY 81305.  
**BASF CORP** —Elastospray 5100-2.0, Elastospray 5100-2.5, Elastospray 81302, Elastospray 81272, Elastospray Alpha System, Elastospray 81252
- 3I. **Gypsum Board** — (Classified or unclassified) — For use with Item 3H. Supplied in sheets nom 2 by 4 ft to 4 by 12 ft, by nom 5/8 in. thick. Min weight 2.0 psf. Applied perpendicular to steel roof deck or direction with adhesive or laid loosely. End joints to occur over crests of steel roof deck with end joints staggered 2 ft in adjacent rows.  
See **Gypsum Board** (CKNX) category for names of manufacturers.
4. **Vapor Retarder — Sheathing Material\*** — (Optional) — Vinyl film or paper scrim vapor barrier, applied to steel roof deck with adhesive (Item 5), asphalt (Item 5A) or laid loosely, overlapped approx 2 in. on adjacent sheets. See **Sheathing Materials** (CHIZ) category for names of manufacturers.
- 4A. **Sheathing Material\*** — (Optional) — In lieu of Item 4, a self adhered rubberized asphalt roofing underlayment membrane which may be placed on top of the steel roof deck (Item 7).  
**W R GRACE & CO - CONN** — Grace Ice and Water Shield, Grace Ice and Water Shield-HT®, Grace Select, Grace Ultra, and Grace Basik.
5. **Adhesive\*** — (Optional) — May be applied between crests of steel roof deck and vapor retarder, between vapor retarder and first layer of insulation, and between layers of insulation. Applied in 1/2 in. wide ribbons 6 in. OC at 0.4 gal/100 sq ft. See **Adhesives** (BYWR) category for names of manufacturers.
- 5A. **Asphalt Or Coal Tar Pitch\*** — (Optional — Not Shown) — In lieu of Item 5, used to attach the first layer of insulation to vapor retarder and each additional layer of roof insulation. Applied at a max rate of 25 lbs/100 sq ft.
- 5B. **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/ft<sup>2</sup>. 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
6. **Mechanical Fasteners** — (Optional — Not Shown) — Mechanical screw-type fastener with metal washer designed for the purpose may be used to attach one or more layers of insulation to steel roof deck.
7. **Steel Roof Deck — (Unclassified)** — Min 1-1/2 in. deep and 30 or 36 in. wide galv or painted fluted steel deck. When unclassified painted steel roof deck is used, Item 8A, Metal Lath, is required. Flutes 6 in. OC with crest width ranging from 3-5/8 to 5-1/16 in. Min gauge is 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports at deck laps and 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.  
**Classified Steel Floor and Form Units\*** — Noncomposite, 1-1/2 in. deep, galv units, min gauge is 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports at deck laps and 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.

**ASC STEEL DECK, DIV OF ASC PROFILES**

INC —24 through 36 in. wide, Types DGB Hi-Form, B Hi-Form, DGB, B, DGN Hi-Form, N Hi-Form, DGN, N, DG2W

Hi-Form, DG2W, 2W, DG3W Hi-Form, 3W Hi-Form, DG3W, and 3W. All units may be galvanized or Prime Shield™.

CANAM STEEL CORP — Type P-3606 or P-3615.

CANAM STEEL CORP — Types B, NS. Units may be ptd/ptd.

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

NEW MILLENNIUM BUILDING SYSTEMS L L C —Type B, BI, F, N. Units may be phos/painted or galvanized.

VERCO DECKING INC - A NUCOR CO —Types PLB, B, PLN, N, PLW2 or W2 Formlok. Units may be phos/ptd. Types

PLB, HSB, PLN or N. Units may be ptd/ptd.

VULCRAFT, DIV OF NUCOR CORP —Types 1.5F, 1.5B, 1.5BI, 3N ptd/ptd units may be used for ratings up to 2 hr.

8. **Spray-Applied Fire Resistive Materials\*** — Applied by mixing with water and spraying in more than one coat to the thickness shown below, to steel surfaces which are clean and free of dirt, loose scale, and oil. Min average and min individual density of 15 and 14 pcf, respectively. For method of density determination, see Design Information Section, Sprayed Material. Spray-Applied Fire Resistive Materials on steel deck shall cover screw tips by 1/2 in. min. Use of adhesive (Item 11) is required. The min thicknesses of Spray-Applied Fire Resistive Materials required for various fire resistance ratings are shown in the table below:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Protection Mtl Thkns In.		
			on Deck#	on Beam	on Joist
1	1	1	7/8	7/16	1(3/4*)
1	1	1	1-7/16+	7/16	1(3/4*)
1-1/2	1-1/2	1-1/2	1-3/16	9/16	1-3/16
1-1/2	1-1/2	1-1/2	2+	9/16	1-3/16
2	1	1	1-7/16	11/16	1-3/16
2	1-1/2	1-1/2	1-7/16	11/16	1-3/16
2	2	2	1-7/16	13/16	1-3/16
2	2	2	2-5/8+	13/16	1-3/16
3	1-1/2	1-1/2	1-7/16	1-3/16	1-5/8
					(1-1/2**)
3	2	2	1-7/8	1-3/16	1-5/8
					(1-1/2**)
3	3	3	1-7/8	1-1/4	1-5/8
					(1-1/2**)

#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 5B is used.

+No minimum insulation thickness required.

\*-The 3/4 in. thickness may be applied when numeral and fiber board insulation is used or when the joist is limited to max tensile stress of 26,000 psi.

\*\*The 1-1/2 in. thickness may be applied when minimum size joist is 12K5.

BERLIN CO LTD — Types 300, 300ES, 300N or SB.

ISOLATEK INTERNATIONAL —Types 300, 300AC, 300ES, 300HS, 300N, or Type SB

LUCKY CORE INSULATING MATERIALS

MANUFACTURING L L C —Types 300, 300ES, 300N, or SB.

NEWKEM PRODUCTS CORP —Types 300, 300ES, 300N, or SB.

- 8A. (As an alternate to Item 8) **Spray-Applied Fire Resistive Materials\*** — Applied by mixing with water and spraying in more than one coat to the thickness shown below, to steel surfaces which are clean and free of dirt, loose scale, and oil. Min average and min individual density of 17.5 and 16 pcf, respectively, for Types 300TW. Min average and min individual density of 22 and 19 pcf, respectively, for Type 400. For method of density determination, see Design Information Section, Sprayed Material. Spray-Applied Fire Resistive Materials on steel deck shall cover screw tips by 1/2 in. min. Use of adhesive (Item 11) is required.

ISOLATEK INTERNATIONAL — Types 300TW, Type 400

LUCKY CORE INSULATING MATERIALS

MANUFACTURING L L C —Type 400.

NEWKEM PRODUCTS CORP —Type 400.

- 8B. **Metal Lath** — Not Shown — Required on unclassified painted steel roof deck. Rib lath, galv or painted, min 2.5 lb/sq yd, with ribs facing down, fastened to deck using No. 8 by 1/2 in. wafer head self-drilling, self-tapping coated steel screws spaced max 15 in. OC in both directions with lath edges overlapped approx 3 in.

9. **Glass Fiber Mesh** — (Optional) — May be used to facilitate the spray application of the protection material to the steel bar joists. Min 3/32 in. sq mesh, coated fiberglass scrim fabric, weighing a min of 1.9 oz/sq yd shall be attached to one side of each joist web member. The method of attachment must be sufficient to hold the mesh and fire protection material during application and curing of the material. An acceptable method of attaching the mesh is by embedding the mesh in min 1/4 in. long beads of hot-melted glue. The beads of glue shall be spaced min 12 in. OC along the top chord of the bar joists. Another method of attachment is the use of 1-1/4 in. long 1/2 in. wide hairpin clips formed from 0.064 in. diam steel wire, alternating from top to bottom of the joist web member.

- 9A. **Metal Lath** — (Optional — Not Shown) — In lieu of Item 9, diamond mesh, 3/8 in. expanded steel, min 2.5 lb/sq yd fastened to one side of joists using No. 18 SWG steel tie wire, located at the midheight of every other web member or 18 in. OC whichever is less. Both sides of lath must be completely coated with Spray-Applied Fire Resistive Materials but with no minimum thickness requirements.

10. **Bridging** — (Not Shown) — Min 1-1/4 by 1-1/4 by 1/8 in. thick steel angles welded to top and bottom chords of each joist. Number and spacing of bridging angles per Steel Joist Institute specification. Bridging coated with the same thickness of Spray-Applied Fire Resistive Materials as the joist to a min distance of 12 in. beyond each side of the joist.

11. **Adhesive\*** — Applied to steel roof deck in accordance with manufacturer's instructions.

ISOLATEK INTERNATIONAL — Type EBS or Type X

\*Bearing the UL Classification Mark