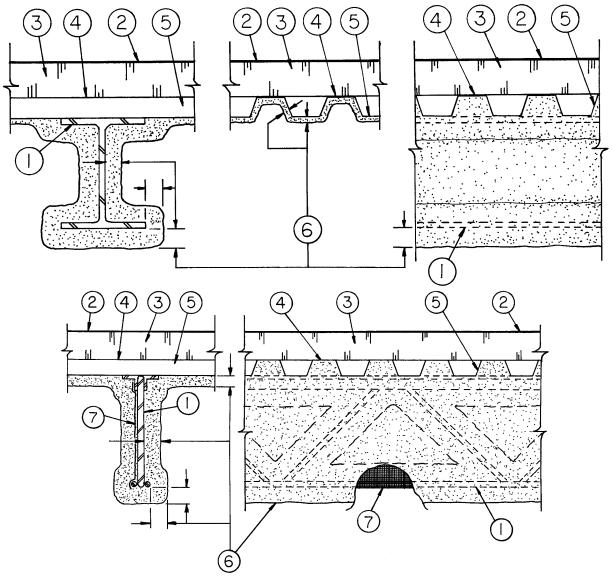
Design No. S721

Restrained Beam Ratings — 1, 1-1/2, 2, 3 or 4 Hr (See Item 6)
Unrestrained Beam Ratings — 1, 1-1/2, 2, 3 or 4 Hr (See Item 6)
Restricted Load Condition — See Item 1
Load Restricted for Canadian Applications — See Guide BXUV7



1. **Steel Supports —** W6x16 min size steel beam, 10K1, 12K3 or 14K1 min size steel joists. Note: When 10K1 or 12K1 joists are used, they will be limited to a max tensile stress of 26,000 psi.
2. **Roof Covering* —** Consisting of hot mopped, cold application or single-ply 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).
3. **Roof Insulation* —** Consisting of building units, foamed plastic or mineral and fiber boards, applied in one or more layers. When multiple layers are used, end and side joints shall be offset a min of 12 in. in both directions in order to lap all joints. See category for names of companies providing Classified products — Building Units (BZXX), Foamed Plastic (CCVW) or Mineral and Fiber Boards (CERZ). Roof insulation shall be compatible with roof covering materials Class A, B or C system. See Roofing Materials and Systems Directory-Roof Covering Materials (TEVT).
4. **Adhesive —** (Optional) — May be applied to steel roof deck units or between insulation layers at a max application rate of 0.4 gal per 100 sq ft. See **Adhesives** (BYWR) category for names of manufacturers.
5. **Steel Roof Deck —** (Unclassified) — Fluted, No. 22 MSG min galv 1-1/2 in. deep with 3-1/2 in. wide flutes spaced 6 in. OC. Ends overlapped a min 1-1/2 in. and welded to supports, 12 in. OC max. Adjacent units button-punched, welded or fastened with No. 12 by 1/2 in. long self-drilling, self-tapping steel screws.
6. **Spray-Applied Fire Resistive Materials* —** Applied by mixing with water and spraying to the beam (or joist) and deck surfaces in one or more coats to the final min thicknesses shown below. Crest areas above the beam (or joist) shall be filled with the Spray-Applied Fire Resistive Materials. Surfaces must be 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.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

	Unrestrained Beam Rating Hr			Restrained Beam Rating Hr			
Rating Hr	Beam	Joists		Beam	Joists		Steel Roof
	W6x16	(a)	(b)	W6x16	(a)	(b)	Deck
1	7/16	3/4	3/4	7/16	3/4	3/4	13/16
1-1/2	9/16	15/16	1-3/16	7/16	3/4	1-1/16	15/16
2	13/16	1-3/16	1-7/16	11/16	1-1/8	1-5/16	1-7/16
3	1-1/4	1-13/16	2-5/16	1-3/16	1-13/16	2-1/8	1-7/8
4	1-1/2	—	—	1-1/2	—	—	1-7/16

(a) Metal lath or nonmetallic fabric mesh secured to one side of open web joist. Spray-Applied Fire Resistive Materials thickness applied to each side of lath or mesh shall be equal to thickness required on steel joist.

(b) Spray-Applied Fire Resistive Materials directly applied to joist contours. As an alternate, metal lath or nonmetallic fabric mesh secured to one side of joist to catch overspray when spraying following joist contours. Metal lath to be fully covered with Spray-Applied Fire Resistive Materials but with no min thickness requirements.

As an alternate to the thickness shown above for the steel beam, the thicknesses shown in the following table are applicable when the thickness applied to the beam's lower flange edges is reduced by one-half. The min thickness applied to the lower flange edges is 1/4 in.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

Rating Hr	Unrestrained Beam Rating Hr	Restrained Beam Rating Hr
1	1/2	1/2
1-1/2	11/16	9/16
2	15/16	13/16
3	1-7/16	1-3/8
4	1-13/16	1-13/16

BERLIN CO LTD — Types 300, 300ES, 300N or SB.
ISOLATEK INTERNATIONAL —Types 300, 300AC, 300ES, 300HS, 300N, or SB.
LUCKY CORE INSULATING MATERIALS MANUFACTURING L L C —Types 300, 300ES, 300N, or SB.
NEWKEM PRODUCTS CORP —Types 300, 300ES, 300N, or SB.

6A. **(As an alternate to Item 6) Spray-Applied Fire Resistive Materials* —** Applied by mixing with water and spraying to the beam (or joist) and deck surfaces in one or more coats to the final min thicknesses shown below. Crest areas above the beam (or joist) shall

be filled with the Spray-Applied Fire Resistive Materials. Surfaces must be clean and free of dirt, loose scale and oil. Min average and min individual density of 17.5 and 16 pcf, respectively, for Type 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.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

	Unrestrained Beam Rating Hr			Restrained Beam Rating Hr			
Rating Hr	Beam	Joists		Beam	Joists		Steel Roof
	W6x16	(a)	(b)	W6x16	(a)	(b)	Deck
1	7/16	3/4	3/4	7/16	3/4	3/4	13/16
1-1/2	9/16	15/16	1-3/16	7/16	3/4	1-1/16	15/16
2	13/16	1-3/16	1-7/16	11/16	1-1/8	1-5/16	1-7/16
3	1-1/4	1-13/16	2-5/16	1-3/16	1-13/16	2-1/8	1-7/8
4	1-1/2	—	—	1-1/2	—	—	1-7/16

(a) Metal lath or nonmetallic fabric mesh secured to one side of open web joist. Spray-Applied Fire Resistive Materials thickness applied to each side of lath or mesh shall be equal to thickness required on steel joist.

(b) Spray-Applied Fire Resistive Materials directly applied to joist contours. As an alternate, metal lath or nonmetallic fabric mesh secured to one side of joist to catch overspray when spraying following joist contours. Metal lath to be fully covered with Spray-Applied Fire Resistive Materials but with no min thickness requirements.

As an alternate to the thickness shown above for the steel beam, the thicknesses shown in the following table are applicable when the thickness applied to the beam's lower flange edges is reduced by one-half. The min thickness applied to the lower flange edges is 1/4 in.

Minimum Spray-Applied Fire Resistive Materials Thickness, In.

Rating Hr	Unrestrained Beam Rating Hr	Restrained Beam Rating Hr
1	1/2	1/2
1-1/2	11/16	9/16
2	15/16	13/16
3	1-7/16	1-3/8
4	1-13/16	1-13/16

ISOLATEK INTERNATIONAL — Types 300TW, 400
LUCKY CORE INSULATING MATERIALS MANUFACTURING L L C —Type 400.
NEWKEM PRODUCTS CORP —Type 400.

7. **Glass Fiber Mesh —** (Optional) — Min 3/32 in. square mesh, coated fiberglass scrim fabric, weighing a min of 1.9 oz per 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 Spray-Applied Fire Resistive Materials 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.
8. **Metal Lath —** (Optional-Not shown) — Diamond mesh, 3/8 in. expanded steel, min 1.7 lb per 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. O.C. whichever is less. Both sides of lath must be completely coated with Spray-Applied Fire Resistive Materials.
9. **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 (Item 6) as the joist.

*Bearing the UL Classification Mark