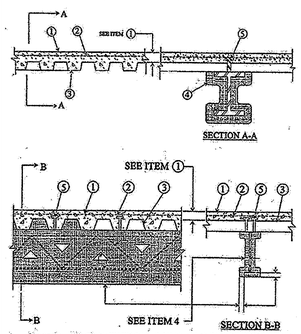
Design No. D925

Restrained Assembly Ratings—3/4, 1, 1-1/2, 2 or 3 Hr
(See Items 1, 6 and 10)
Unrestrained Assembly Rating—0 Hr (See Items 3, 4, 4A and 10)
Unrestrained Beam Ratings—1, 1-1/2, 2, 3 and 4 Hr
(See Items 4, 4A and 10)



Supports—W8x28 or W12x16 steel beam or steel Joists, 10K1 or 16K2 min size with a max tensile stress of 30,000 psi or 32K3 min size with a max tensile stress of 24,000 psi. Or joist girders (not shown), composite or noncomposite. Welded or bolted to end supports. Joist Girder designed per S.J.I. specifications for a max tensile stress of 30 ksi. May be either uncoated or provided with a shop coat of paint. For the 2 h or less Restrained or Unrestrained Beam Ratings, top and bottom chords shall each consist of two angles with a min total area of 0.96 and 0.77 sq in., respectively. Web members shall be either round bars or angles. Min area of the end diagonal web shall be 0.444 sq in. Min area of each of the first two interior diagonal webs shall be 0.406 sq in. All other interior webs shall have a min area of 0.196 sq in. For the 3 h Restrained or Unrestrained Beam Ratings, each of the top and bottom chords shall each consist of two angles with a min total area of 1.74 sq in. Web members shall be either round bars or angles. Min area of each of the first five end diagonal webs shall be 0.886 sq in. All other interior webs shall have a min area of 0.441 sq in. For the 4 h Restrained or Unrestrained Beam Ratings, each of the top and bottom chords shall consist of two angles with a min total area of 1.74 sq in. Web members shall be either round bars or angles. Min area of each of the first five end diagonal webs shall be 0.886 sq in. All other interior webs shall have a min area of 0.441 sq in. Compression web members with a slenderness ratio greater than 60, shall be limited to 80 percent of their allowable design load. Bridging per S.J.I. specifications is required when noncomposite joists are used. For noncomposite joists, steel filler pieces of proper size, 1 to 2 in. long shall be welded to and between the top chord angles at midway between all top chord panel points.
As alternate to double angles, (not shown) structural tee sections may be used for top and bottom chords as follows:

Restrained Or Unrestrained Beam Ratings, H	Top Chord	Bottom Chord
1, 1-1/2 or 2	ST1.5X2.75	ST1.5X2.85
3 or 4	ST3X6.25	ST3X6.25

1. Normal Weight or Lightweight Concrete—Normal weight concrete carbonate or siliceous aggregate, 3500 psi compressive strength, vibrated. Lightweight concrete, expanded shale, or slate aggregate by rotary-kiln method, or expanded clay aggregate by rotary-kiln or sintered-grate

FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

method, 3000 psi compressive strength, vibrated, 4 to 7 percent entrained air.

Restrained Assembly Rating, Hr	Concrete (Type)	Concrete Unit Weight, pcf.	Concrete Thickness, In.
1	Normal Weight	147-153	3-1/2
1-1/2	Normal Weight	147-153	4
2	Normal Weight	147-153	4-1/2
3	Normal Weight	147-153	5-1/4
3/4 or 1 (See Item 6)	Lightweight	107-113	2-1/2
1	Lightweight	107-120	2-5/8
1-1/2	Lightweight	107-113	3
2	Lightweight	107-113	3-1/4
2	Lightweight	107-116	3-1/4*
2	Lightweight	114-120	3-1/2
3	Lightweight	107-113	4-3/16
3	Lightweight	114-120	4-7/16

*For use with 2 or 3 in. steel floor and form units only.
2. Welded Wire Fabric—6 x 6, 10 x 10 SWG.
3. Steel Floor and Form Units*—Composite 1-1/2, 1-5/8, 2 or 3 in. deep galv units or 4-1/2 in. deep noncomposite galv units. Fluted units may be uncoated or phosphatized/painted. Min gauge are 22 MSG for fluted and 20/20 MSG for cellular units. The following combinations of units may be used:
(1) All 1B, 2A, 2C 28 or 36 in. wide cellular.
(2) All fluted.
(3) One or two 3 in. deep, 12 in. wide, 18/18 MSG min cellular units, alternating with 3 in. deep fluted or other cellular.
(4) Any blend of fluted and 1B, 2A, 2C, 28, or 36 in. wide cellular.
(5) 3 in. deep, 30 in. wide cellular with 8-1/8 in. wide valley alongside joints may be used when 3/8 in. diam reinforcing bars are placed 1-1/2 in. to each side of side joints and 1 in. above bottom of units.
(6) Corrugated, 1-5/16 in. deep, 30 in. wide, 24 MSG min galv units with shear wires factory welded to deck corrugations. Welded to supports 12 in. OC. through welding washers. For shear wire spacing of 8 in. or less the steel deck stress shall not exceed 20 KSI. For shear wire spacing greater than 8 in. OC. but less than or equal to 12 in. OC. steel deck stress shall not exceed 12 KSI.
ASC Pacific Inc.—24 in. wide Types B, BF-24, BR, BM00, BRM00, N, NF, 2W24, 3W24, 2WF24, 3WF24; 30 in. wide Types, B, BF-30, BR; 36 in. wide Types B-36, 2W36, 3W36, 2WF36, 3WF36; 24 or 30 in. wide Types ASC2 or ASC3.
Bowman Metal Deck/Wheeling Corrugating Co., Div. of Wheeling-Pittsburgh Steel Corp.—30 in. wide, Types 1-1/2 in. V-Grip, 1-1/2 in. RVG-Grip, 2 in. VW; 24 in. wide, Types 1-1/2 in. VW6, or 3 in. V-Grip, 3 in. VW3, 212VW2-Wireway, 312VW2-Wireway, 208VW3-Wireway, 258VW3-Wireway; 24 or 32 in. wide Types 208V-Grip, 258V-grip; 24 or 36 in. wide Types 212V-Grip, 312V-Grip; 36 in. wide Types 212VW3-Wireway, 312VW3-Wireway. Types 1-1/2 in. V-Grip, 212V-Grip and 312V-Grip may be phos/ptd.
Components for field installed cellular metal raceway system:
Raceway Bottom—24 or 36 in. wide Types 212 VS, 312 VS; 24 or 36 in. wide Types 208 VS, 258 VS.
Raceway Cover Plate—Types CP-12, CP-16.
Raceway Divider—Type DC-20, DC-25.
Raceway Isolation Trough—Types T-20, T-25, T-30.
Cheng Ho Steel Co., Ltd.—24 or 36 in. wide Types LF2, LF3.
Consolidated Systems, Inc.—24 in. wide Types CFD-2, CFD-3; 24, 30 or 36 in. wide Type CFD-1.5; 24 or 36 in. wide Types Hac-Lok 2, Hac-Lok 3 and Hac-Lok 1.5; Types B2C, B2FC, N2C, NFC; 30 in. wide Type B3C; 12 in. wide Mac-Way cellular 45 MOW, 2-633 MTWA, 3-633 MTWA, 3-633 MTW, 3-633 MTW+, 24 in. wide Type Versa-Deck.
Elbxir Industries, Metal Deck Div.—24, 30 or 36 in. wide Types LXR-8, LXR-8 inverted; 24 or 36 in. wide Type LXR-3W.
Epic Metals Corp.—24 in. wide Types ECI150, ECP150, ECI300, ECP300, EC366, ECP366, EC150, EC300 inverted, Epicore A; 30 in. wide Types ECB150, ECBR150; 36 in. wide Types EC366.
Robertson, A United Domiron Co.—OL Types, 24 in. wide 3 or 3 inverted, UKX, UKX-3, 2 in. 39, AKX, 21 or 21 inverted, 121, NKX, TKX; 24 or 30 in. wide GKX, GKX-A; 36 in. wide 99, AKX, WKX; 24 26, 94, 36 in. wide 1.5WKX, NKC, AKX, 2 or 3 in. TKC; 12 in. wide noncomposite Sec. 12; 17 in. wide 21; 26 or 28 in. wide UKX, 87.5 cm wide. Side joints of OL 99, 121, WKX, TKX, TKC, and Metric units—OL-77-900; OLC-78-900; may be welded together 60 in. O.C. Side joints of 99, AKX, WKX, GKX, GKX-A, TKX and Metric units—OL-77-900 and OLC-78-900 may be fastened together with min 1 in. long No. 12x14 self-drilling, self-tapping steel screws 36 in. O.C.
Les Acier Canam Inc.—36 in. wide; 1-1/2 in. Type P36315HB. The max superimposed loadings for Type P36315HB units shall not

FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

exceed 250 PSF. For single spans, the use of the units shall be limited to 5 ft. 6 in., 6 ft 0 in. and 6 ft 6 in. max spans for the 22, 20 and 18 gauge units, respectively. For multiple spans, 18 gauge units may be used on a max 7 ft 6 in. span with a max total superimposed loading of 240 PSF.
BHP Lysaght—Taiwan Ltd.—24 in. wide Type 2W24 and 36 in. wide Types 2W36 and 3W36.
United Steel Deck, Inc.—24 in. wide, Types 1-1/2, 2 or 3 in. LOK-Floor and LOK-Floor Cell; 36 in. wide, Types 2 or 3 in. LOK-Floor and LOK-Floor Cells; 24 in. wide, Types N-LOK and N-LOK Cell; 24, 30 or 36 in. wide, Type 1-1/2 in. B-LOK and B-LOK Cell.
Verco Mfg., Inc.—Formlok types, 24 or 36 in. wide. W2 and W3; 24 in. wide, B, BN, BR; 30 in. wide B, BR; 12 in. wide W2 or W3 units may be blended with 24 or 36 in. wide W2 or W3, respectively.
Vulcraft, Div. of Nucor Corp.—24, 30 or 36 in. wide, Type 1.5 VL, 1.5 VLI, 1.5 VLP; 24 or 36 in. wide. Types 2VLI, 2VLP, 3VLI, 3 VLP.
Walker Div. of Butler Mfg. Co.—24 in. wide Types 2 or 3 in. WDR; 16, 30, 31 or 32 in. wide 2V, 2Vsudov, 3V, 3Vsudov.
Wheeling Corrugating Co., Div of Wheeling-Pittsburgh Steel Corp.—30 in. wide Types SB-150, -150N, -150NR, -150R; 30 or 36 in. wide Types SB-B16LF, -B16LFR; 24 or 36 in. wide Types P20LF, SB-P21LF, -P21LF; 24 in. wide Types P20LF, SB-200, -300. Type SB-B16LFR may be phos/ptd.
Spacing of welds attaching units to supports shall be 12 in. OC for 12, 24 and 36 in. wide units, four welds per sheet for 30 in. wide units, 6 in. OC for 18 in. wide and Sec. 12 units. Unless noted otherwise, adjacent units button-punched or welded together 36 in. OC alongside joints. Adjacent 18 in. wide units welded together 30 in. OC alongside joints. For 3 Hr Rating, units with overlapping type side joints welded together 24 in. OC max.
The Unrestrained Assembly Rating is equal to the Unrestrained Beam Rating for a max of 3 Hr and is limited to the following floor units and spans:
(a) 1-1/2, 2 and 3 in. deep, 24 in. wide, 22 MSG or thicker fluted with clear spans not more than 7 ft, 8 in.
(b) 1-1/2, 2 and 3 in. deep, 24 in. wide, 20 MSG or thicker fluted with clear spans not more than 8 ft, 8 in.
(c) 1-1/2 and 2 in. deep, 24 in. wide, 18 MSG or thicker fluted and 18/18 MSG or thicker cellular with clear spans not more than 9 ft, 11 in.
(d) 3 in. deep, 36 in. wide, 18 MSG or thicker fluted and 24 in. wide, 20/18 MSG or thicker cellular with clear spans not more than 13 ft, 2 in.
For assemblies utilizing 3-1/4 in. lightweight concrete topping with a max Restrained Assembly Rating of 2 Hr, the Unrestrained Assembly Rating is equal to the Unrestrained Beam Rating and is limited to the following floor units and spans:
(a) 1-1/2, 2 and 3 in. deep, 24 or 36 in. wide, 22 MSG fluted and 20/20 MSG cellular with clear spans not more than 9 ft, 6 in.
(b) 2 and 3 in. deep, 24 or 36 in. wide 20 MSG fluted and 20/20 MSG cellular with clear spans not more than 10 ft, 0 in.
(c) 3 in. deep, 24 in. wide, 20 MSG fluted and 20/20 MSG cellular with clear spans not more than 13 ft, 2 in.
4. Spray-Applied Fire Resistive Materials—Applied by mixing with water and spraying in one or more coats to a final thickness as shown in the tables below, to steel beam surfaces which must be clean and free of dirt, loose scale and oil. Min avg and min ind density of 15/14 pcf, respectively for Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6S, RG. Min avg and min ind density of 22/19, respectively for Types MK-6/601, Z-106. For method of density determination, refer to Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	W8x28 Beam	Spray-Applied Fire Resistive Materials Thk, In. W12x16 Beam Supporting All Fluted Floor Units
1	1	1	1/2	7/16,
1-1/2	1	1	11/16**	11/16,
1-1/2	1	1	1/2	7/16,
2	1	1	11/16**	11/16,
1-1/2.	1-1/2	1-1/2	13/16,	3/4,
2	1	1	1-1/16**	1**
1-1/2	1-1/2	1-1/2	1/2	7/16,
2	1-1/2	1-1/2	11/16**	11/16**
2	2	1	1-1/16,	1-1/16,
2	2	2	1-1/16,	1,
3	1-1/2	1-1/2	1-5/16**	1-3/16,
3	2	1	1-5/16**	1-5/16
3	2	2	1-5/16**	1-5/16
3	3	1	1-5/16	1-5/16
3	3	2	1-5/8	1-5/16
3	3	3	2	2-11/16

**This thickness applies when optional Item 10 is used over 3-1/4 in. light weight concrete topping.

FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

The thicknesses of Spray-Applied Fire Resistive Materials shown in the table below are applicable when the thickness applied to the beams' lower flange edges is reduced to one-half that shown in the table.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	W8x28 Beam	Spray-Applied Fire Resistive Materials Thk, In. W8x28 Beam Supporting All Fluted Floor Units	W12x16 Beam	W12x16 Beam Supporting All Fluted Floor Units
1	1	1	9/16	7/16+	3/4	5/8
1-1/2	1	1	9/16	7/16+	3/4	5/8
1-1/2	1-1/2	1-1/2	7/8	3/4	1-5/16	1
2	1	1	9/16	7/16+	3/4	5/8
2	2	2	1-3/16	1	1-5/8	1-3/8
3	1-1/2	1-1/2	7/8	3/4	1-3/16	1
3	3	3	1-3/4	1-9/16	2-3/8	2-1/8
3	3	4	2-5/16	2-1/16	3-1/8	2-3/4

+Thickness applied to beams' lower flange edges shall be a minimum of 1/4 in.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Spray-Applied Fire-Resistive Materials Thk. In. For 10K1 Joists Spaced More Than 4 ft OC	4 ft or Less OC	Joist Girder
1	1	1	1-1/8	15/16	1-1/8
1-1/2	1-1/2	1-1/2	1-5/8	1-7/16	1-3/4
2	1	1	1-7/16	1-7/16	—
2	2	2	2-3/16	1-7/8	2-1/4
3	3	3	3-1/2	2-13/16	2-7/8
3	3	4	—	—	2-7/8

Restrained And Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Spray-Applied Fire-Resistive Mtls Min Thkns In. For 12K3 Or 16K2 Joists Spaced More than 4 ft OC	4 ft or Less OC
1	1	15/16	7/8
1-1/2	1-1/2	1-1/2	1-5/16
2	2	2-1/16	1-13/16
3	3	3-1/4	2-13/16

*No min insulation thickness required.
11. Nonmetallic Fabric Mesh—(Optional)—As an alternate to metal lath, glass fiber fabric mesh, weighing approx 2.5 oz/sq yd, polypropylene fabric mesh, weighing approx 1.25 oz/sq yd or equivalent, may be used to facilitate the spray application. The mesh is secured to one side of each joist web member. The mesh must be stretched tight mesh be sufficient to hold the mesh and the spray applied Spray-Applied Fire Resistive Materials material in place during application until it has cured. An acceptable method to attach 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 a max of 12 in. OC along the top chord of the bar joist. Another method to secure the mesh is by 1-1/4 in. long by 1/2 in. wide hairpin clips formed from No. 18 SWG or heavier steel wire.
11A. Metal Lath—(Not Shown)(Required with Item 10B, optional with Items 10, 10A)—Metal lath shall be 3/8 in. expanded diamond mesh, weighing 2.5 lb per sq yd. Secured to underside of steel deck with No. 12 by 3/8 in. pan head self-drilling, self-tapping screws and steel washers with an outside diam of 1/2 in. screws spaced 12 in. OC in both directions with lath edges overlapped approx 3 in.
11B. Metal Lath—(Optional)—(Not shown)—Metal lath may be used to facilitate the spray application of Spray-Applied Fire Resistive Materials on steel bar joists and trusses. The diamond mesh, 3/8 in. expanded steel lath, 1.7 to 3.4 lb/sq yd is secured to one side of each steel joist with No. 18 SWG galv steel wire at joist web and bottom chord members spaced 15 in. OC max. When used, the metal lath is to be fully covered with Spray-Applied Fire Resistive Materials with no min thickness requirements.
*Bearing the UL Classification Marking

FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

Note: Type C-106 Spray-Applied Fire Resistive Materials to be used with galv steel roof units only.
10. Spray-Applied Resistive Material*—Applied by mixing with water and spraying in more than one coat to final thicknesses as shown in the table below and in the table below to steel surfaces which must be clean and free of dirt, loose scale and oil. Steel deck surface must be "spatter" coated with Type SK-III Spray-Applied Fire Resistive Materials prior to application of spray-applied resistive material. Type SK-III spray-applied resistive material applied in accordance with the manufacturer's application instructions. Min average and min individual density of 15/14 pcf, respectively. For method of density determination, see Design Information Section. Thickness of the spatter coat is included in the total final thickness of the protection material.

Restrained Assembly Rating h	Unrestrained Assembly Rating h	Unrestrained Beam Rating h	OnSteelDeck With Gypsum Wallboard	OnSteelDeck Without Gypsum Wallboard	For 10K1 Joists Spaced More Than On Beam	4 ft OC	4 ft or Less OC
1	1	1	11/16	1	1/2	1-1/8	15/16
1	1	1	1*	1-5/8*	1/2	1-1/8	15/16
1-1/2	1	1	3/4	1-1/4	9/16	1-5/16	1-5/16
1-1/2	1-1/2	1-1/2	1	1-3/8	3/4	1-7/16	1-7/16
1-1/2	1-1/2	1-1/2*	2-5/8*	2-5/8*	3/4	1-7/16	1-7/16
2	1	1	1	1-3/4	3/4	1-7/16	1-7/16
2	1-1/2	1-1/2	1	1-3/4	3/4	1-7/16	1-7/16
2	2	2	1-1/4	1-11/16	1	2-3/16	2-3/16
2	2	2*	2-5/8*	2-5/8*	1	2-3/16	2-3/16
3	1-1/2	1-1/2	2-1/8	1-3/16	3-1/4	2-13/16	2-13/16
3	2	1	1-1/2	2-1/8	1-3/16	3-1/4	2-13/16
3	2	2	2*	2-5/8*	1	2-3/16	2-3/16
3	3	1	1-3/4	1-9/16	2-1/8	3-1/4	2-13/16
3	3	2	1-5/8	2-11/16	2-3/16	3-1/4	2-13/16
3	3	3	2	3-1/4	1-7/8	2-11/16	2-3/16

**This thickness applies when optional Item 10 is used over 3-1/4 in. light weight concrete topping.

FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

10B. Alternate Spray-Applied Fire Resistive Materials*—Applied by mixing with water and spraying in one or more coats to final thicknesses as shown in the table below to steel beam surfaces which must be clean and free of dirt, loose scale and oil. When steel deck is used, the area between the steel deck and the beams top flange shall be filled. Application to steel roof deck requires the installation of expanded metal lath. See Item 11A. Min avg and min ind density of 40/36 pcf, respectively. For method of density determination, refer to Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	OnSteelDeck With Gypsum Wallboard	OnSteelDeck Without Gypsum Wallboard	For 10K1 Joists Spaced More Than On Beam	4 ft OC	4 ft or Less OC
1	1	1	11/16	1	1/2	1-1/8	15/16
1	1	1	1*	1-5/8*	1/2	1-1/8	15/16
1-1/2	1	1	3/4	1-1/4	9/16	1-5/16	1-5/16
1-1/2	1-1/2	1-1/2	1	1-3/8	3/4	1-7/16	1-7/16
1-1/2	1-1/2	1-1/2*	2-5/8*	2-5/8*	3/4	1-7/16	1-7/16
2	1	1	1	1-3/4	3/4	1-7/16	1-7/16
2	1-1/2	1-1/2	1	1-3/4	3/4	1-7/16	1-7/16
2	2	2	1-1/4	1-11/16	1	2-3/16	2-3/16
2	2	2*	2-5/8*	2-5/8*	1	2-3/16	2-3/16
3	1-1/2	1-1/2	2-1/8	1-3/16	3-1/4	2-13/16	2-13/16
3	2	1	1-1/2	2-1/8	1-3/16	3-1/4	2-13/16
3	2	2	2*	2-5/8*	1	2-3/16	2-3/16
3	3	1	1-3/4	1-9/16	2-1/8	3-1/4	2-13/16
3	3	2	1-5/8	2-11/16	2-3/16	3-1/4	2-13/16
3	3	3	2	3-1/4	1-7/8	2-11/16	2-3/16

Grace Construction Products—Types K-601, Z-106.
Grace Korea Inc.—Type Z-106.
*No min insulation thickness required.
10A. Alternate Spray-Applied Fire Resistive Materials*—Applied by mixing with water and spraying in one or more coats to final thicknesses as shown in the table below to steel beam surfaces which must be clean and free of dirt, loose scale and oil. When steel deck is used the area between the steel deck and the beams top flange shall be filled. Min avg and min ind density of 22/19 pcf, respectively. For method of density determination, refer to Design Information Section

Restrained Assembly Rating h	Unrestrained Assembly Rating h	Unrestrained Beam Rating h	OnSteelDeck With Gypsum Wallboard	OnSteelDeck Without Gypsum Wallboard	For 10K1 Joists Spaced More Than On Beam	4 ft OC	4 ft or Less OC
1	1	1	11/16	1	1/2	1-1/8	15/16
1	1	1	1*	1-5/8*	1/2	1-1/8	15/16
1-1/2	1	1	3/4	1-1/4	9/16	1-5/16	1-5/16
1-1/2	1-1/2	1-1/2	1	1-3/8	3/4	1-7/16	1-7/16
1-1/2	1-1/2	1-1/2*	2-5/8*	2-5/8*	3/4	1-7/16	1-7/16
2	1	1	1	1-3/4	3/4	1-7/16	1-7/16
2	2	2	1-1/4	1-11/16	1	2-3/16	2-3/16
2	2	2*	2-5/8*	2-5/8*	1	2-3/16	2-3/16
3	1-1/2	1-1/2	2-1/8	1-3/16	3-1/4	2-13/16	2-13/16
3	2	1	1-1/2	2-1/8	1-3/16	3-1/4	2-13/16
3	3	3	1-7/8	2-7/16	1-1/2	3-1/4	2-13/16

Grace Construction Products—Types Z-146
Grace Korea Inc.—Type Z-146
*No min insulation thickness required.
11. Nonmetallic Fabric Mesh—(Optional)—As an alternate to metal lath, glass fiber fabric mesh, weighing approx 2.5 oz/sq yd, polypropylene fabric mesh, weighing approx 1.25 oz/sq yd or equivalent, may be used to facilitate the spray application. The mesh is secured to one side of each joist web member. The mesh must be stretched tight mesh be sufficient to hold the mesh and the spray applied Spray-Applied Fire Resistive Materials material in place during application until it has cured. An acceptable method to attach 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 a max of 12 in. OC along the top chord of the bar joist. Another method to secure the mesh is by 1-1/4 in. long by 1/2 in. wide hairpin clips formed from No. 18 SWG or heavier steel wire.
11A. Metal Lath—(Not Shown)(Required with Item 10B, optional with Items 10, 10A)—Metal lath shall be 3/8 in. expanded diamond mesh, weighing 2.5 lb per sq yd. Secured to underside of steel deck with No. 12 by 3/8 in. pan head self-drilling, self-tapping screws and steel washers with an outside diam of 1/2 in. screws spaced 12 in. OC in both directions with lath edges overlapped approx 3 in.
11B. Metal Lath—(Optional)—(Not shown)—Metal lath may be used to facilitate the spray application of Spray-Applied Fire Resistive Materials on steel bar joists and trusses. The diamond mesh, 3/8 in. expanded steel lath, 1.7 to 3.4 lb/sq yd is secured to one side of each steel joist with No. 18 SWG galv steel wire at joist web and bottom chord members spaced 15 in. OC max. When used, the metal lath is to be fully covered with Spray-Applied Fire Resistive Materials with no min thickness requirements.
*Bearing the UL Classification Marking

FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

Rmax Inc.—Type Multi-Max FA
Johns Manville—Types N1, N2
3A. Foamed Plastic*—Not Shown—As an alternate to Item 3, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., with formed channels on the top side and a flat bottom face, to be applied in one layer. Min thickness as measured at the thinnest cross section of polyisocyanurate shall be in accordance with Item 3. No limit on max thickness (as measured at the thickest section of the board). Insulation covered with field applied 3/8 min thick nonvenser 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.—Type INSUL-AIR.
NRG Barriers, Inc.—Type ISO-HEMT.
3B. 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 1.3 in. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. Adhesive (Item 6) may be applied between the building units and the vapor retarder (or gypsum wallboard if vapor retarder is not used).
Atlas Roofing Corp.—AC Foam Nail Base Insulation and Vented R as measured at the thinnest cross section of polyisocyanurate shall be in accordance with Item 3.
Celotex Corp.—Hy-Therm Nail-Line.
3C. Roof Insulation-Mineral and Fiber Boards*—(Not Shown) —Optional. Applied in one or more layers over the Foamed Plastic (Item 3) to be applied with adhesive (Item 6), asphalt or coal tar pitch (Item 7) or mechanically fastened (Item 8).
Johns Manville International Inc.
3D. Building Units*—(Not Shown)—Optional. Applied over the Foamed Plastic (Item 3) to be applied with adhesive (Item 6), asphalt or coal tar pitch (Item 7) or mechanically fastened (Item 8).
Johns Manville International Inc.
4. Gypsum Wallboard—(Not shown)—(Classified or Unclassified)—May be used to obtain various Restrained or Unrestrained Assembly Ratings as described in Item 10. Supplied in sheets nom 4 by 8 or 12 ft by 5/8 in. thick. Min weight 2.2 psf. Applied perpendicular to steel roof deck direction with end joints staggered 2 ft in adjacent rows. End joints to occur over crests of steel roof units. See Gypsum Wallboard (CKNX) category for names of manufacturers.
5. Vapor Retarder—Sheathing Material*—(Optional)—(Not shown)—Vinyl film or paper scrim vapor barrier, applied to steel roof deck or gypsum wallboard with adhesive (Item 6), hot asphalt (Item 7) or laid loosely, overlapped approx 2 in. on adjacent sheets. See Sheathing Material (CHIZ) category for names of manufacturers.
6. Adhesive*—(Optional)—The vapor retarder, the gypsum wallboard or the first layer of roof insulation may be secured with adhesive to the steel roof surface. 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 in 1/2 in. wide ribbons 6 in. OC at a 0.4 gal/100 sq ft. See Adhesives (BYWR) category for names of manufacturers.
7. Asphalt or Coal Tar Pitch*—(Optional)—(Not shown) —The vapor retarder, the gypsum wallboard of the first layer of roof insulation may be secured with asphalt or coal tar pitch to the steel crest surfaces at a max rate of 25 lb/100 sq ft. 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 roof insulation, applied at a max rate of 25 lb/100 sq ft.
8. Mechanical Fasteners—(Optional)—(Not shown) —Mechanical screw-type fastener with metal or plastic washer designed for the purpose may be used to attach one or more layers of insulation to steel roof deck.
9. Steel Roof Deck—(Unclassified)—Min 1-1/2 in. deep and 36 in. wide galv fluted steel deck. Min gauge is No. 22 MSG. Ends overlapped at supports a min 1-1/2 in., and welded to supports 12 in. OC and at side laps. Side laps fastened with 1/2 in. long hex head, self-drilling, self-tapping steel screws spaced a max of 36 in. OC.
Classified Steel Floor and Form Units*—Noncomposite 1-1/2 to 3 in. deep, 24 to 36 in. wide, min 22 MSG galvanized steel fluted units. Ends overlapped at supports a min 1-1/2 in. and welded to supports 12 in. OC and at side laps. Side laps fastened with 3/4 in. long No. 12 self-drilling, self-tapping steel screws at 36 in. OC. As alternate to screw fasteners adjacent units may be button-punched or welded together 36 in. OC along side joints.
Bowman Metal Deck/Wheeling Corrugating Co. Div of Wheeling-Pittsburgh Steel Corp.—Galv Types B, F and N, ptd/ptd units may be used for ratings up to 2 h.
Vulcraft, Div. of Nucor Corp.—Galv Types 1.5B, 1.5BI, 1.5F, 3N and 3NI, ptd/ptd units may be used for ratings up to 2 h.
Wheeling Corrugating Co. Div. Of Wheeling-Pittsburg Steel Corp.—Types B, BW, F and N, ptd/ptd units may be used for ratings up to 2 h.

FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

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.
Splitset Inc.—Mix No. 3.
9. Foamed Plastic*—(Optional-not shown) For use only with vermiculate or cellular concretes-Rigid polystyrene foamed plastic insulation having slots and/or holes sandwiched between vermiculite concrete slurry which is applied to the normal or lightweight concrete surface and concrete topping. Max thickness to be 8 in.
Splitset Inc.
Vermiculite Products, Inc.
10. Roof Insulation-Mineral and Fiber Boards* or Foamed Plastic*—(Optional, not shown)—Mineral and fiber boards or polyisocyanurate roof insulation applied over concrete floor with no restriction on board thickness. When mineral and fiber boards or polyisocyanurate roof insulation are used the unrestrained beam rating shall be increased by a min of 1/2 hr. See Mineral and Fiber Boards (CERZ) or Foamed Plastic (CCWH) category for names of Manufacturers.
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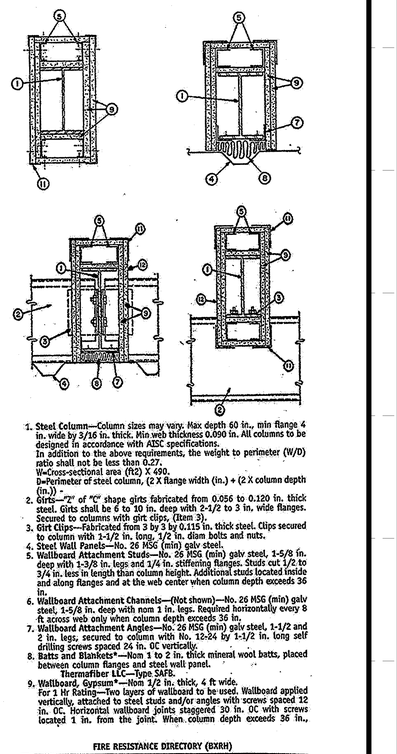
FIRE RESISTANCE RATINGS - ANSI/UL263 (BXUV)—*Continued*

Design No. X524

Ratings—1 and 2 Hr. (See Item 9)



1. Steel Column—Column sizes may vary. Max depth 60 in., min flange 4 in. wide by 3/16 in. thick. Min web thickness 0.090 in. All columns to be designed in accordance with AISC specifications.
In addition to the above requirements, the weight to perimeter (W/D) ratio shall not be less than 0.27.
W=Cross-sectional area (in2) X 490.
D=Perimeter of steel column, (2 X flange width (in.) + (2 X column depth (in.)) -
2. Girts—"Z" or "C" shape girts fabricated from 0.056 to 0.120 in. thick steel. Girts shall be 6 to 10 in. deep with 2-1/2 to 3 in. wide flanges. Secured to columns with girt clips, (Item 3).
3. Girt Clips—Fabricated from 3 by 3 by 0.115 in. thick steel. Clips secured to column with 1-1/2 in. long, 1/2 in. diam bolts and nuts.
4. Steel Wall Panels—No. 26 MSG (min) galv steel.
5. Wallboard Attachment Studs—No. 26 MSG (min) galv steel, 1-5/8