

Design No. D832

June 14, 2002

Restrained Assembly Ratings — 1, 1-1/2, 2 and 3 Hr.

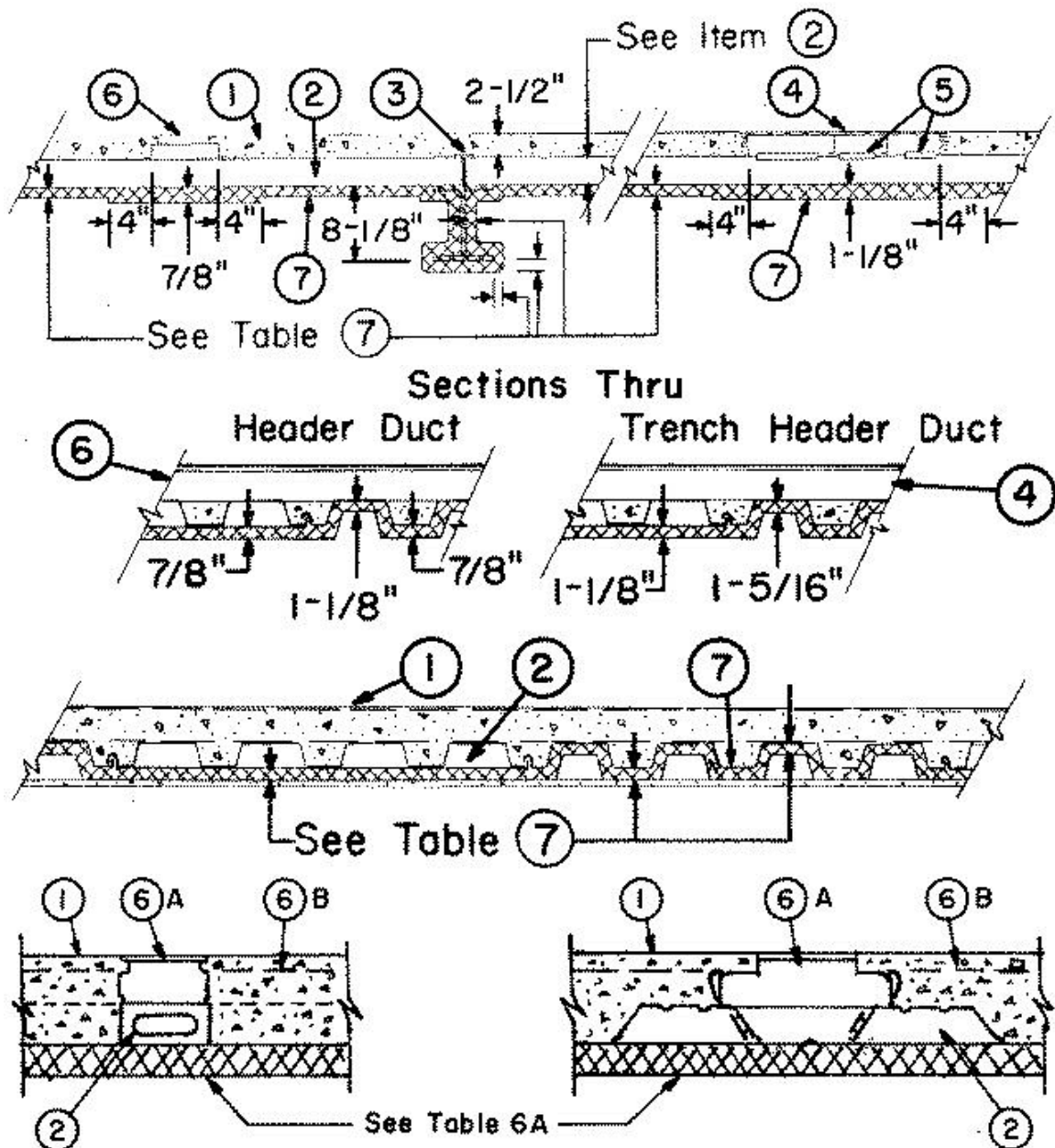
(See items 4, 6A and 7)

Unrestrained Assembly Ratings — 1, 1-1/2, 2 and 3 Hr.

(See Items 4 and 7)

Unrestrained Beam Ratings — 1, 1-1/2, 2 and 3 Hr.

(See Items 4 and 7)



Beam — W8X24 or W8X28, min size. (See Item 7).

1. **Normal-Weight or Light-Weight Concrete** — Normal weight concrete, carbonate or siliceous aggregate, 150 +or- 3 pcf unit weight, 3500-psi compressive strength, vibrated. Lightweight concrete, expanded shale, clay, or slate aggregate by rotary-kiln method, 112 +or- 3 pcf unit wt, 3000 psi compressive strength, vibrated, 4 to 7 per cent entrained air.

2. **Steel Floor and Form Units*** — Composite 1-1/2, 2 or 3 in. deep galv units. Min gauges are 22 MSG for fluted and 20/20 MSG for cellular. In spans containing a bottomless trench header, min 20/18 MSG cellular units and/or min 20 MSG fluted units shall be used. For spans with trench headers the allowable loading shall be based on noncomposite design. The following combinations of units may be used:

(1) All fluted

(2) 1 or more fluted to one cellular.

CONSOLIDATED SYSTEMS INC — 24 or 36 in. wide Types CFD-1.5, CFD-2 or CFD-3, 24 in. wide Types NC. Types CFD-2, CFD-3, and NC may be phos/ptd. Type EBS adhesive is required on phos/ptd units. (See Item 7).

Spacing of welds attaching units to supports shall be at each side and not to exceed 16 in. OC between sides. Unless noted otherwise, adjacent units button-punched or welded together 36 in. OC along side joints.

Alternate Construction — Noncomposite units of the same type listed above may be used provided allowable loading is calculated on the basis of noncomposite design.

3. **Joint Cover** — 2 in. wide cloth adhesive tape applied following the contour of the steel floor units.

4. **Trench Header** — (Bearing the UL Listing Mark). Constructed of steel and provided with metal edge screeds. When the trench header is located near a support the load carrying capacity of the span may be based on the allowable moment or shear stress of the floor units at the edge of the trench header away from the support or on the allowable composite moment or shear capacity of the slab at the center of the span, whichever governs.

As an alternate in spans employing min 20/18 MSG cellular floor units and/or min 20 MSG fluted floor units, trench headers (Bearing the UL Listing Mark) without the bottom pan may be used. The allowable superimposed load for spans with a bottomless trench header shall be based on noncomposite design. The bottomless trench header, with a max width of 36 in., consists of two cell closers which conform to the contour of the floor units, placed along the sides of the desired trench header location and welded to the floor units. The side rails, consisting of extruded aluminum screeds secured to galv steel channels (min 18 MSG), are positioned over the cell closers, aligned, and welded or riveted to the cell closers and floor units. A separate U-shaped galv steel channel (min 18 MSG), serving as the power compartment, is welded or riveted to the floor units. Steel cover plates, 1/4 in. thick, shall be secured to the side rails. In bottomless trench headers wider than 18 in., each side joint of the steel floor units shall be welded with a 1 in. long weld near the trench header centerline. For QG-GKX-24 or -30 cellular floor units only, a separate KED-PTS (UL Listed) power transition sleeve is secured to power compartment with one rivet or screw. The use of the bottomless trench header requires additional protection underneath the trench header. Fireproofing thickness shall be increased as shown on the following table:

Restrained & Unrestrained Assembly Rating Hr	Thk of Type D-C/F Spray Applied Resistive Mtl	
	on Crests	on Valley & Flat Plate
1	1-3/16	1
1-1/2	1-1/2	1-5/16
2	1-3/4	1-5/8
3	2-1/4	2-1/8

The use of the trench header requires additional protection underneath the trench header (See Item 7). The additional protection shall extend a min of 4 in. beyond the sides of the trench header.

4A. Trench Header — With an intermittent bottom (as an alternate to Item 4) when Type WDR cellular units are used — (Bearing the UL Listing Mark) — The allowable superimposed load for spans with an intermittent bottom trench header shall be based on noncomposite design. The intermittent bottom trench header, with a maximum width of 36 in., consists of horizontal closure plates, (min No. 16 MSG) with 4 threaded studs pre-welded on the top side of each plate near its corners. The plates to be placed over the fluted areas of the floor units and affixed to the floor units by welds at each corner. Concrete is to be vibrated into the voids formed by the plates and the fluted areas of the units beneath the trench header. The upper side rail is extruded aluminum attached to the lower steel side rail clip with an adjusting screw. The lower side rail positioned over the edge of the horizontal closure plates snapped-on the pre-welded threaded studs on top of the plates. The use of the intermittent bottom trench header requires additional protection underneath the trench header. (See Item 7) The additional protection shall extend a min of 4 in. beyond the sides of the intermittent bottom trench header.

5. Access Openings — As required, with grommets.

6. Header Duct — (Bearing the UL Listing Mark) 1-1/2 in. deep by 6-7/8 in. wide. Housing constructed of steel.

6A. Electrical Inserts — Preset and after set electrical inserts Classified as **Outlet Boxes and Fittings Classified for Fire Resistance** *. Unless specified otherwise for a particular preset electrical insert type, the spacing of the preset electrical inserts shall be not less than 24 in. on center along cellular steel floor units with not more than one preset electrical insert in each 8 sq ft of floor area. The required thickness of Spray-Applied Fire Resistive Materials on the steel floor units with inserts shall be sprayed the entire length and width of the units between supports and shall extend beyond the edge of inserts onto adjacent floor units for a minimum horizontal width of 12 in. In floor spans (between supports) containing electrical inserts, the entire floor span (fluted and cellular steel floor units) must be sprayed with a minimum of 3/8 in. thickness of Spray-Applied Fire Resistive Materials.

H H ROBERTSON — Inserts

(Tapmate II, II-EA, II-FN, II-EAFN; Series KEB)

Installed per accompanying installation instructions over factory-punched holes in QL-AKX or QL-WKX floor units. Inserts are used in the pre-active, active or abandoned condition. Required Spray-Applied Fire Resistive Materials thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Mtl Thkns In.
(Tapmate II, II-EA)			
2	QL-AKX, -WKX	NW	7/8
2	QL-AKX	LW	1-1/16
2	QL-WKX	LW	15/16
3	QL-AKX	NW	1-1/4
3	QL-AKX	LW	1-1/2
3	QL-WKX; Metric	NW	1-3/16
	Units-QLC-78-900		
3	QL-WKX; Metric	LW	1-3/8
	Units-QLC-78-900		

(Tapmate II-FN or II-EAFN)			
2	QL-AKX, -WKX; Metric	NW	7/16
	Units-QLC-78-900		
2	QL-AKX, -WKX; Metric	LW	3/4
	Units-QLC-78-900		
3	QL-AKX, -WKX; Metric	NW	3/4
	Units-QLC-78-900		

The hole cut in insert cover for passage of wires shall be no more than 1/8 in. larger diam than the wire. For abandonment of Tapmate inserts, see installation instructions.

The Tapmate II-FN insert may use KEM-HP-1 outlet box fittings in lieu of the KEB-PC flush cover fittings.

(Tapmate II-EAFN-FC1; Series KEB)

Installed per accompanying installation instructions over factory-punched holes in QL-WKX floor units. Inserts are used in the pre-active, active, or abandoned condition. Required Spray-Applied Fire Resistive Materials thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Mtl Thkns In.
2	QL-WKX	NW	7/16

For abandonment, see installation instructions.

(Tapmate III-FN, III-EAFN; Series KEC)

Installed per accompanying installation instructions over factory-punched holes in QL-AKD or QL-WKD floor units. Inserts are used in the pre-active, active, or abandoned condition. Required Spray-Applied Fire Resistive Materials thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Mtl Thkns In.
(Tapmate III-FN or III-EAFN)			
2	QL-AKD, WKD; Metric	NW	1/2
	Units-QLC-78-C-900,		
	-78-E-900, -78-F-900		
2	QL-AKD, WKD; Metric	LW	13/16
	Units-QLC-78-C-900,		
	-78-E-900, -78-F-900		
3	QL-AKD, -WKD	NW	3/4
(Tapmate III-EAFN-FC1)			

2	QL-WKD	NW	1/2
	QL-WKD	LW	13/16
3	QL-AKD, WKD; Metric	NW	3/4
	Units-QLC-78-C-900,		
	-78-E-900, -78-F-900		

The hole cut in insert cover for passage of wires shall be no more than 1/8 in. larger diam than the wire. For abandonment of Tapmate inserts, see installation instructions.

The Tapmate III insert may use KEB-HP-1; Series KEC outlet box fittings with the same hourly rating and fireproofing thicknesses as specified for the Tapmate II-EAFN electrical inserts.

(Tapmate IV, IV-EA, IV-H, IV-H-M, IV-S)

Installed per accompanying installation instructions over factory-punched holes in QL-GKX-24 or -30 floor units. Inserts are used in the preactive, active or abandoned condition. Required Spray-Applied Fire Resistive Materials thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Mtl Thkns In.
(Tapmate IV, IV-H, IV-H-M, IV-S)			
1	QL-GKX	NW, LW	3/8
1-1/2	QL-GKX	NW	1/2
1-1/2	QL-GKX	LW	9/16
2	QL-GKX	NW	5/8
2	QL-GKX	LW	3/4
3	QL-GKX	NW	1-1/4
3	QL-GKX	LW	1-1/2
(Tapmate IV-EA)			
1	QL-GKX	NW, LW	7/16
1-1/2	QL-GKX	NW	9/16
1-1/2	QL-GKX	LW	5/8
2	QL-GKX	NW	3/4
2	QL-GKX	LW	7/8

The holes cut in insert cover for passage of wires shall be no more than 1/8 in. larger diameter than the wire. For abandonment of inserts see installation instructions.

Type KED-HP-1 outlet box fittings may be used with Tapmate IV box assemblies or in lieu of Tapmate IV or IV-EA fittings with the same hourly ratings and protection material thicknesses as specified for the above electrical inserts.

(Tapmate IV-FN-S, IV-FN-H, IV-EAFN; Series KED)

Installed per accompanying installation instructions over factory-punched holes in QL-GKX-24 or -30 floor units. Inserts are used in the preactive, active, or abandoned condition. Required Spray-Applied Fire Resistive Materials thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
(Tapmate IV-FN-S, IV-FN-H, IV-EAFN)			
2	QL-GKX	NW	1/2
2	QL-GKX	LW	13/16
3	QL-GKX	NW	3/4

The hole cut in insert cover for passage of wires shall be no more than 1/8 in. larger diameter than the wire. For abandonment see installation instructions.

Type KED-HP-1 outlet box fittings may be used with Tapmate IV box assemblies or in lieu of Tapmate IV-FN-S, IV-FN-H, IV-EAFN fittings with the same hourly ratings and protection material thicknesses as specified for the above electrical inserts.

(Tapmate KED-MSA Multi-Service After set Inserts)

Installed per accompanying installation instructions in core-drilled holes over QL-GKX-24 or -30 steel floor units. Spacing of after set inserts shall be not more than one insert per each 7-1/2 sq ft of floor area with not less than 25-1/2 in. between edges of adjacent after set inserts. After set inserts may be installed with either the flip lid plastic cover (KEC-PC3, PC4 and PC5 components) or the Deluxe Cover (KED-NAC type). Required Spray-Applied Fire Resistive Materials thicknesses on steel floor units with inserts are tabulated below:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Mtl Thkns In.
1	QL-GKX	NW, LW	3/8
1-1/2	QL-GKX	NW	1/2
1-1/2	QL-GKX	LW	9/16
2	QL-GKX	NW	5/8
2	QL-GKX	LW	3/4
3	QL-GKX	NW	1-1/4
3	QL-GKX	LW	1-1/2

H H ROBERTSON — Tapmate II, II-EA, II-FN, II-EAFN, II-EAFN-FC1; Series KEB. Tapmate III-FN, III-EAFN, III-EAFN-FC1; Series KEC. Tapmate IV, IV-EA, IV-EAFN, IV-FN-S, IV-FN-H, IV-H, IV-H-M, IV-S; Series KED, Tapmate KED-MSA.

Consolidated Systems, Inc. MSIX Inserts.

May be used for 2 hr Restrained Assembly Rating only with normal weight or lightweight concrete. Installed per accompanying installation instructions over factory pre-punched knockouts or factory installed over pre-punched knockout holes in Mac-Way 2- or 3-633 MTWA cellular floor units. Required Spray-Applied Fire Resistive Materials thicknesses on cellular floor units with inserts are:

Restrained Assembly Rating Hr	Floor Unit Type	Concrete Type	Min Mtl Thkns In.
2	Mac-Way 2-, 3-633 MTWA	NW	1/2
2	Mac-Way 2-, 3-633 MTWA	LW	7/8

The holes cut in the activation covers for passage of wires shall be no more than 1/8 in. larger diameter than the wire. Abandonment requires use of insert cover with no holes in it.

CONSOLIDATED SYSTEMS INC — MISX insert. Type MSH-400 and MSH-450 activating fittings.

Walker Systems Inc. Inserts

(NRG Bloc IV Preset Inserts; FAKM-II, RAKM-II, RAKM, RPF, FPF, S36BB, S36BC, S36CC, S37BB, S37BC, S37CC, S36PB, S36PC, S36PP, S37PB, S37PC, S37PP Service Fittings)

Installed per accompanying installation instructions over factory-punched holes in 3 in. deep K-Type cellular steel floor units. Openings made in the two-part access hatch of the Type RAKM service fitting for passage of wires shall be no greater than 1/8 in. larger than diameter of wire. When Type RPF, FPF, S36PB, S36PC, S36PP, S37PB, S37PC or S37PP service fittings are used, furniture whip for power feed from service fitting cover to be liquid-tight steel conduit with cast steel 90 degree elbow connector. Refer to installation instructions for Classified assemblies. The required Spray-Applied Fire Resistive Materials thicknesses on steel floor units with inserts are tabulated below:

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
(Type RAKM-II, S36BB, S36BC, S36CC)			
1	3 in. K	LW or NW	3/8
1-1/2	3 in. K	LW or NW	7/16
2	3 in. K	LW or NW	11/16
3	3 in. K	LW or NW	1
(Type FAKM-II)			
1, 1-1/2	3 in. K	LW or NW	3/8
2	3 in. K	LW or NW	7/16
3	3 in. K	LW or NW	13/16
(Types RAKM, S37BB, S37BC or S37CC)			
1, 1-1/2	3 in. K	LW or NW	3/8
2	3 in. K	LW or NW	11/16
(Type RPF, S37PB, S37PC, S37PP)			
1	3 in. K	NW, LW	3/8
1-1/2	3 in. K	NW	3/8
1-1/2	3 in. K	LW	1/2
2	3 in. K	NW	9/16

2	3 in. K	LW	3/4
3	3 in. K	NW	1
(Type FPF, S36PB, S36PC, S36PP)			
1, 1-1/2	3 in. K	LW, NW	3/8
2	3 in. K	LW, NW	7/16
3	3 in. K	LW, NW	13/16

(PK Series Preset Inserts: RPF, S37PB, S37PC, S37PP Service Fittings)

Installed per accompanying installation instructions over factory pre-punched knockouts or factory installed over pre-punched knockouts in Type WDR2 or WDR3 cellular steel floor units. Furniture whip for power feed from service fitting cover to be liquid-tight steel conduit with cast steel 90 degree elbow connector. Refer to installation instructions for Classified assemblies. Required Spray-Applied Fire Resistant Materials thicknesses on floor units with inserts are:

Restrained Assembly Rating Hr	Concrete Type	Min Spray Applied Fire Resistant Mtl Thkns In.
(Type RPF, S37PB, S37PC, S37PP)		
1	NW	3/8
1	LW	1/2
1-1/2	NW	7/16
1-1/2	LW	5/8
2	NW	11/16
2	LW	7/8
3	NW	1-1/8

(Types TSAR, TSACR After set Inserts)

After set inserts installed per accompanying installation instructions in holes core-drilled through concrete topping to top of cells of the cellular floor units. Types TSAR and TSACR for use in 7 in. diam holes. Spacing shall be not more than one insert in each 4 sq ft of floor area with not less than 2 ft center to center of adjacent inserts. The required Spray-Applied Fire Resistant Materials thicknesses on floor units with inserts are shown below:

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistant Mtl Thk In.
(Types TSAR, TSACR)			
1	WDR2 or WDR3	NW, LW	1/2
1-1/2	WDR2 or WDR3	NW, LW	3/4
2	WDR2 or WDR3	NW, LW	1-1/4

WALKER SYSTEMS INC — Type NRG Bloc IV preset inserts; Type FAKM-II, RAKM-II, RAKM, RPF, FPF, S36BB, S36BC, S36CC, S37BB, S37BC, S37CC, S36PB, S36PC, S36PP, S37PB, S37PC or

S37PP service fittings. Type PK-Series inserts; Type RPF, S37PB, S37PC or S37PP service fittings. Type TSAR, TSACR after set inserts.

6B. **Welded Wire Fabric** — 6 by 6 - W1.4xW1.4 Required only when electrical inserts (Item 6A) are used.

7. **Spray-Applied Fire Resistive Materials*** — Applied by spraying with water in one or more coat to final untamped thicknesses as shown in the table below, to steel surfaces which are free of dirt, oil, or scale. Under bottomless and intermittent trench headers (Items 4 and 4A), under for Type WDR cellular floor units, under 20/20 MSG cellular floor units and under 22 MSG fluted floor units, the use of adhesive is required; adhesive is optional for the other conditions and heavier gauges of floor units. Min avg untamped density is 13 pcf with min ind untamped density of 11 pcf for Types I, II or DC/F. Min avg and min ind densities of 22 and 19 pcf, respectively, for Type HP. For method of density determination, refer to Design Information Section.

The required thicknesses of Spray-Applied Fire Resistive Materials for various floor conditions and ratings are tabulated below:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Min Required Unrestrained Beam Rating Hr	Concrete Type	Min Mtl Thk In. Steel Floor & Form Units		
				Beam	Crests	Valley Flat Plate
2	1	1	NW or LW	1/2+++	1/2	3/8
3	1-1/2	1-1/2	NW or LW	5/8+++	11/16	1/2
+++Applicable only when min W8X28 beam is used and protected with Type D-C/F, Type II or Type HP.						
Ratings, concrete types, and thickness shown below applicable when min W8X24 beam is used.						
2	1	1	NW or LW	5/8	1/2	3/8
3	1-1/2	1-1/2	NW or LW	3/4	11/16	1/2
2	2	2	NW or LW	1-1/8	1/2	3/8
3	3	3	NW	1-3/8	11/16	1/2
3	3	3	LW	1-7/16	11/16	1/2
Mac-Way 2-or 3-633 MTWA cellular units are covered only for the ratings, concrete types and thicknesses shown below:						
2	1, 1-1/2 or	1, 1-1/2 or				
	2	2	NW or LW	++++	—	1/2
3	1, 2 or	1-1/2, 2 or	NW or LW	++++	—	5/8
	3	3				

+++See above beam thickness for applicable Unrestrained Beam and Unrestrained Assembly ratings.

When Type WDR cellular units are used, for the general floor area without trench headers or electrical inserts, the following thicknesses of Spray-Applied Fire Resistive Materials are required on the steel floor units for the various Restrained and Unrestrained Assembly Ratings only when min W8X24 steel beam is used:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Min Required Unrestrained Beam Rating Hr	Concrete Type	Min Mtl Thkns In.		
				on Beam	on Steel Deck	
					Fluted	Cellular
1	1	1	NW	1/2	—	3/8
1, 1-1/2, 2	1	1	LW	5/8	3/8	1/2
1-1/2	1	1	NW	1/2	—	3/8
1-1/2	1-1/2	1-1/2	NW	7/8	—	3/8
2	1	1	NW	1/2	—	1/2
2	2	2	NW	11/16	—	1/2
3	1-1/2	1-1/2	NW	7/8	—	15/16
3	2	2	NW	11/16	—	15/16
3	3	3	NW	1-3/8	—	15/16

When trench header (Item 4A) is used with Type WDR cellular units, the following thicknesses of Spray-Applied Fire Resistive Materials are required on the steel floor units for the various Restrained and Unrestrained Assembly Ratings.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Concrete Type	Min Mtl Thkns In. Trench Header Intermittent (Item 4A)		
			Crests	Valley	Flat Plate
1	1	LW, NW	1-3/16	1	1
1-1/2	1-1/2	NW	1-1/2	1-1/4	1-1/4+
1-1/2	1	LW	1-1/2	1-1/4	1-1/4+
2	2	NW	1-3/4	1-5/8	1-5/8+
2	1	LW	1-3/4	1-5/8	1-5/8+

+Steel studs with discs (Item 12) must be welded to the cellular units below the trench header.

CIL GROUP LTD — Type D-C/F or Type II. Type EBS or Type X adhesive.

ISOLATEK INTERNATIONAL — Type D-C/F, HP or II. Type E.B.S. or Type X adhesive.

8. **Shear Connector Studs** — Optional — (Not Shown) — Studs, 3/4 in. diam, by 3 in. long for 1-1/2 in. deep form units to 5-1/4 in. deep for 3 in. units, headed type or equivalent per AISC specifications. Welded to top beam flange through steel form units.

9. **Roof Covering** — (Not Shown) — Optional — Class A, B or C **Built-Up Roof Covering Materials** * consisting of asphalt (or coal tar pitch) and felt in alternate layers placed over concrete slab.

See Building Materials Directory for descriptions.

10. **Insulation*** — (Not Shown) — Optional — Rigid Insulation Boards installed as indicated below:

A. **Foamed Plastic*** — Rigid polystyrene foamed plastic insulation boards, no restriction on thickness, installed with or without adhesion, over roof covering (item 9). Covered with min 10 psf crushed stone or concrete pavers.

THE DOW CHEMICAL CO

W R GRACE & CO - CONN CONSTRUCTION PRODUCTS DIV

B. **Mineral and Fiber Board*** — (For use in 2 hr. assembly ratings only) - applied over concrete floor with no restriction on thickness. When mineral and fiber board is used. **Compatible Roof Covering materials** *, providing Class A, B or C coverage shall be used. See Roofing Systems (TGFU) in Building Materials Directory.

11. **Vermiculite Concrete** — (Not Shown) — Optional — Min 2 in. thick, consisting of 6 cu ft **Vermiculite Aggregate** * to 94 lb Portland cement and 0.5 lb air entraining agent, poured over Zonolite insulation (Item 10). May be covered with any built-up or single ply **Roof Covering Materials** *.

ELASTIZELL CORP OF AMERICA — Types MS 16-U, MSV 200.

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11A. **Perlite Concrete** — Mix consists of 6.2 cu ft Perlite Aggregate* to 94 lbs of Portland cement and 1-1/2 pt air entraining agent. Compressive strength 80 psi min.

See Perlite Aggregate (CFFX) category for names of Classified companies.

12. **Cellular Concrete — Roof Topping Mixture*** — (Not Shown) — Optional — Foam concentrate mixed with water and Portland cement per manufacturer's application instruction. 28 day compressive strength of min 190 psi as determined in accordance with ASTM C495-86, min 2 in. thick, poured above the foamed plastic (Item 10A). May be covered with any built-up or single ply roof covering materials*.

CELLULAR CONCRETE L L C — Cast dry density of 37 (+ 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.

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

13. **Steel Studs with Discs** — (Not Shown) — The stud consists of No. 12 SWG galv steel wire, of a length 3/8 in. shorter than the thickness of protection material, with one end welded to 1-3/16 in. diam No. 28 MSG galv steel disc. The total number of studs shall average at least one stud per 236 sq in. of cellular floor units beneath the trench header. The ends of studs opposite the discs shall be welded to the cellular floor units in rows running parallel with the trench header. The distance between the outer rows of studs and the edge of the trench header shall not exceed 4 in. The spacing between rows shall not exceed 22 in. The spacing between the studs in each row shall not exceed 24 in.

*Bearing the UL Classification Mark

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