

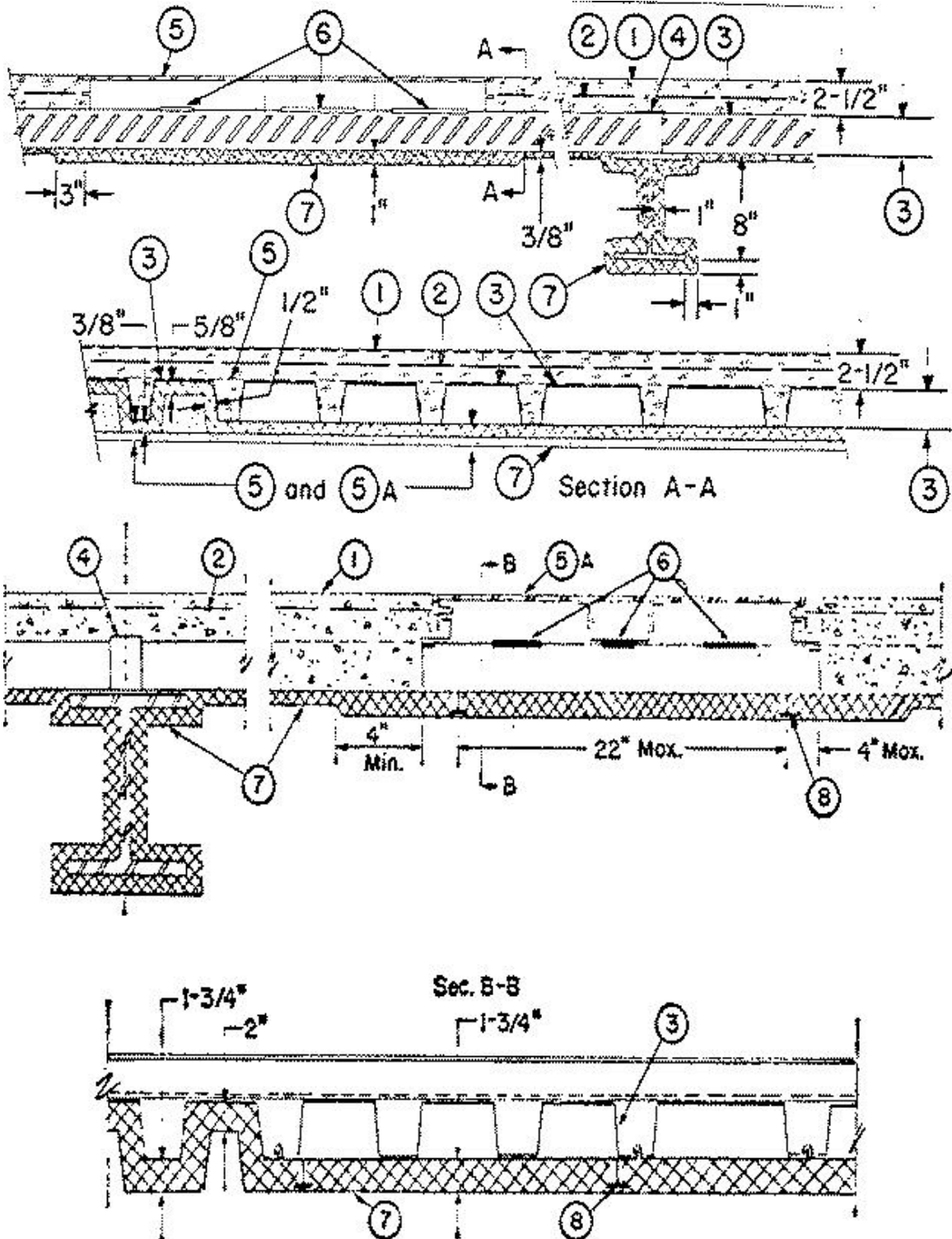
Design No. D712

April 24, 2002

Restrained Assembly Ratings — 1, 1-1/2 or 2 Hr. (See Item 9)

Unrestrained Assembly Ratings — 1-1/2 or 2 Hr. (See Item 3)

Unrestrained Beam Rating — 2 Hr.



Beam — W8X24, min size.

1. **Normal-Weight or Lightweight Concrete** — Normal weight concrete, carbonate or siliceous aggregate, 150 (+or-) 3 pcf unit weight, 2500 psi compressive strength, vibrated. Lightweight concrete, expanded shale or slate aggregate by rotary-kiln method or expanded clay by rotary-kiln or sintered-grate method, 110 pcf unit weight, 3000 psi compressive strength, vibrated, 4 to 7 per cent entrained air.

2. **Welded Wire Fabric** — 6x6 — 10/10SWG.

3. **Steel Floor and Form Units*** — Composite 1-1/2, 2 or 3 in. deep galv units. Min gauges are 22 MSG for fluted and 20/18 MSG for cellular. For spans with trench headers the allowable loading shall be based on noncomposite design. Any combination of fluted and cellular units may be used. When the use of cellular steel floor units exceeds a 1:1 blend with fluted steel floor units, the max Restrained Assembly Rating is 2 Hr. and the max Unrestrained Assembly Rating is 1-1/2 Hr. When all fluted steel floor units are used, the max Unrestrained Assembly Rating is 2 Hr., provided that the thickness of Spray-Applied Fire Resistive Materials applied to the crests and valleys is 5/8 in.

CONSOLIDATED SYSTEMS INC — 24 or 36 in. wide Types CFD-2, CFD-3; 24, 30 or 36 in. wide Type CFD-1.5. Units may be phos/ptd.

Spacing of welds attaching units to supports shall be not over 12 in. OC. 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.

4. **Cover plate** — No. 18 MSG galv steel, 4 in. wide, welded to steel floor units, 10 in. O.C.

5. **Trench-header** — (Bearing the UL Listing Mark.) Constructed of steel with metal edge screeds. When the trench header is located near the supports the load carrying capacity of the span may be based on the allowable moment or shear stress of the form units at the edge of the trench away from the support, or on the allowable composite moment of shear capacity of the slab at the center of the span, whichever governs. The Spray-Applied Fire Resistive Materials thickness of floor units below this trench header shall be 1 in. below the bottom plane of units with the flutes completely filled except for 2 in. and 3 in. deep floor units, where thickness in flutes shall be 1-1/8 in.

5A. **Trench Header** — Trench header (Bearing UL Listing Mark), without the bottom pan. The allowable superimposed load for spans with bottomless trench shall be based on noncomposite design. This trench header, ranging in width from min 12 in. to max 36 in., consists of two cell closers which conform to the contour of the floor units, place along the sides of the desired trench 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 closers and floor units. A separate U shaped 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 heads wider than 18 in. each side joint of the steel floor units shall be welded together with a 1 in. long weld near the trench header centerline. For QL-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 this trench requires additional protection underneath the trench. Fireproofing thickness shall be increased to 1-3/4 in. in the crests and 1-5/8 in. on valleys and flat plates. These thickness shall extend a min of 4 in. beyond the edge of the trench header.

6. **Access Openings** — As required, with grommets.

7. **Spray-Applied Fire Resistive Materials*** — Applied by mixing with water and spraying in more than one coat to the final thickness as shown above, to steel 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 method of density determination see Design Information Section. Types 4, 5GP, 8GP, 9GP, MK-4 may be used only in general floor areas without concrete penetrations with all fluted steel floor

units or blends consisting of one or more fluted units to one 24 in. wide max cellular unit, 1-1/2 or 3 in. deep, with cells spaced approx 6 and 8 in. respectively.

Use of a spatter coat Type DK, SK-1 or SK-III is required on all cellular units with flat plate on the bottom, optional on other steel surfaces. Thickness of the spatter coat is included in the total final thickness of the protection material.

ARABIAN VERMICULITE INDUSTRIES — Type MK-5

GRACE CANADA INC — Types MK-5, SK-1.

GRACE KOREA INC — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6s, Monokote Acoustic 1, SK-III.

PYROK INC — Type LD.

SOUTHWEST VERMICULITE CO — Types 4, 5, 5EF, 5GP, 5MD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD, DK.

VERMICULITE PRODUCTS INC — Types 4, 5, DK.

W R GRACE & CO - CONN CONSTRUCTION PRODUCTS DIV — Types MK-4, MK-5, MK-6/HY, MK-6s, Monokote Acoustic 1, RG, SK-III.

8. Steel Studs With Discs — Used below trench header — The stud consists of a No. 12 SWG galv wire, 1-3/8 in. long with one end welded to a 1-3/16 in. diam, No. 28 MSG (0.020 in. thick) galv steel disc. The total number of studs shall avg 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 and the edge of the trench header shall not exceed 4 in. The spacing between the rows shall not exceed 22 in. The spacing between studs in each row shall not exceed 24 in.

8A. Steel Studs With Discs — Used below **Mac-Way** 45MDW cellular units with electrical inserts — The stud consists of a No. 12 SWG galv wire 3/8 in. long with one end welded to a 1-3/16 in. diam, No. 28 MSG (0.020 in. thick) galv steel disc. The total number of studs shall avg at least one stud per 236 sq in. of cellular floor units. The ends of studs opposite the discs shall be welded to the cellular floor units in rows running parallel with the floor units. The distance between the outer rows and the edge of the cellular unit shall not exceed 4 in. The spacing between studs in each row shall not exceed 24 in.

9. Electrical Inserts — (Not Shown) — 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. O.C. along cellular steel floor units with not more than one preset electrical insert in each 4 sq ft of floor area. The required thickness of Spray-Applied Fire Resistive Materials on the cellular steel floor units with electrical inserts shall be sprayed the entire length and width of the cellular steel floor units between supports and shall extend onto adjacent floor units for a minimum horizontal width of 12 in.

(1) **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 cellular steel floor units with inserts are:

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
(Tapmate II or II-EA)			
2	QL-AKX, -WKX	NW	7/8
2	QL-AKX	LW	1-1/16
2	QL-WKX	LW	15/16
(Tapmate II-FN or II-EAFN)			
2	QL-AKX, -WKX	NW	1/2
2	QL-AKX, -WKX	LW	3/4

The holes 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 KEB-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 resistive materials thicknesses on cellular steel floor units with inserts are:

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
2	QL-WKX	NW	1/2

For abandonment see installation instructions.

(Tapmate III-FN, III-EAFN, III-EAFN-FC1; Series KEC)

Installed per accompanying installation instructions over factory-punched holes on QL-AKD or QL-WKD floor units. Inserts are used in the pre-active, active or abandoned condition. Required spray-applied resistive materials thickness on floor units with inserts are:

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
(Tapmate III-FN or III-EAFN)			
2	QL-AKD, -WKD	NW	1/2
2	QL-AKD, -WKD	LW	3/4
(Tapmate III-EAFN-FC1)			
2	QL-WKD	NW	1/2

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 III-EAFN electrical inserts.

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

Installed per accompanying installation instructions over factory-punched holes in 24 or 30 in. wide Type QL-GKX 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:

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

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
1, 1-1/2	QL-GKX	NW, LW	1/2
2	QL-GKX	NW	5/8
2	QL-GKX	LW	3/4
(Tapmate IV-EA)			
1	QL-GKX	NW, LW	1/2
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)

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 resistive materials thicknesses on cellular steel 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	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.

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.

(2) Consolidated Systems, Inc. Inserts

(Dual Cell and Triple Cell).

Dual-Cell preset insert is factory attached to top of cell of Mac-Way 45MDW floor unit. Triple-Cell preset insert is factory attached to top of cell of Mac-Way 3-633MTWA floor unit. Service fittings and abandonment fittings are installed in inserts per accompanying installation instructions. Required Spray-Applied Fire Resistive Materials thicknesses on cellular steel floor units with inserts are:

Restrained Assembly Rating Hr	Concrete Type	Min Spray Applied Fire Resistive Mtl Thkns In.
2	NW	3/4
2	LW	1-1/16

Steel studs with discs per item 8A above, are required only on Mac-Way 45MDW cellular unit with electrical inserts.

(MSIX Insert)

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 steel floor units. Either Type MSH-400 or MSH-450 fittings are installed with MSIX insert per accompanying installation instructions. 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. Required Spray-Applied Fire Resistive Materials thickness on cellular units with inserts is:

Restrained Assembly Rating Hr	Concrete Type	Min Spray Applied Fire Resistive Mtl Thkns In.
2	NW	3/4

CONSOLIDATED SYSTEMS INC — Type MSH500 or MHH-AD fittings with Type Dual-Cell inserts. Type MSH700 or MSH-AT fittings with Type Triple Cell inserts. Type MSIX preset insert.

(3) Walker Systems Inc. Preset Inserts.

Installed per accompanying installation instructions over factory-punched holes in 3 in. deep K-Type cellular steel floor units. Either Type RAKM-II, FAKM-II, S36BB, S36BC or S36CC service fittings are installed with Type N-R-G Bloc IV Series preset inserts per accompanying installation instructions. Refer to installation instructions for Classified assemblies. The required Spray-Applied Fire Resistive Materials thicknesses on steel floor units with inserts are:

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
(RAKM-II, S36BB, S36BC, S36CC)			
1, 1-1/2	3 in. K	LW, NW	3/8
2	3 in. K	LW, NW	1/2
(FAKM-II)			
1	3 in. K	LW, NW	3/8
1-1/2	3 in. K	LW, NW	7/16
2	3 in. K	LW, NW	9/16

WALKER SYSTEMS INC — Type N-R-G Bloc IV Series inserts; Type RAKM-II, FAKM-II, S36BB, S36BC or S36CC service fittings.

*Bearing the UL Classification Mark

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