



BXUV.D722

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

[See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States Design Criteria and Allowable Variances](#)

[See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada Design Criteria and Allowable Variances](#)

Design No. D722

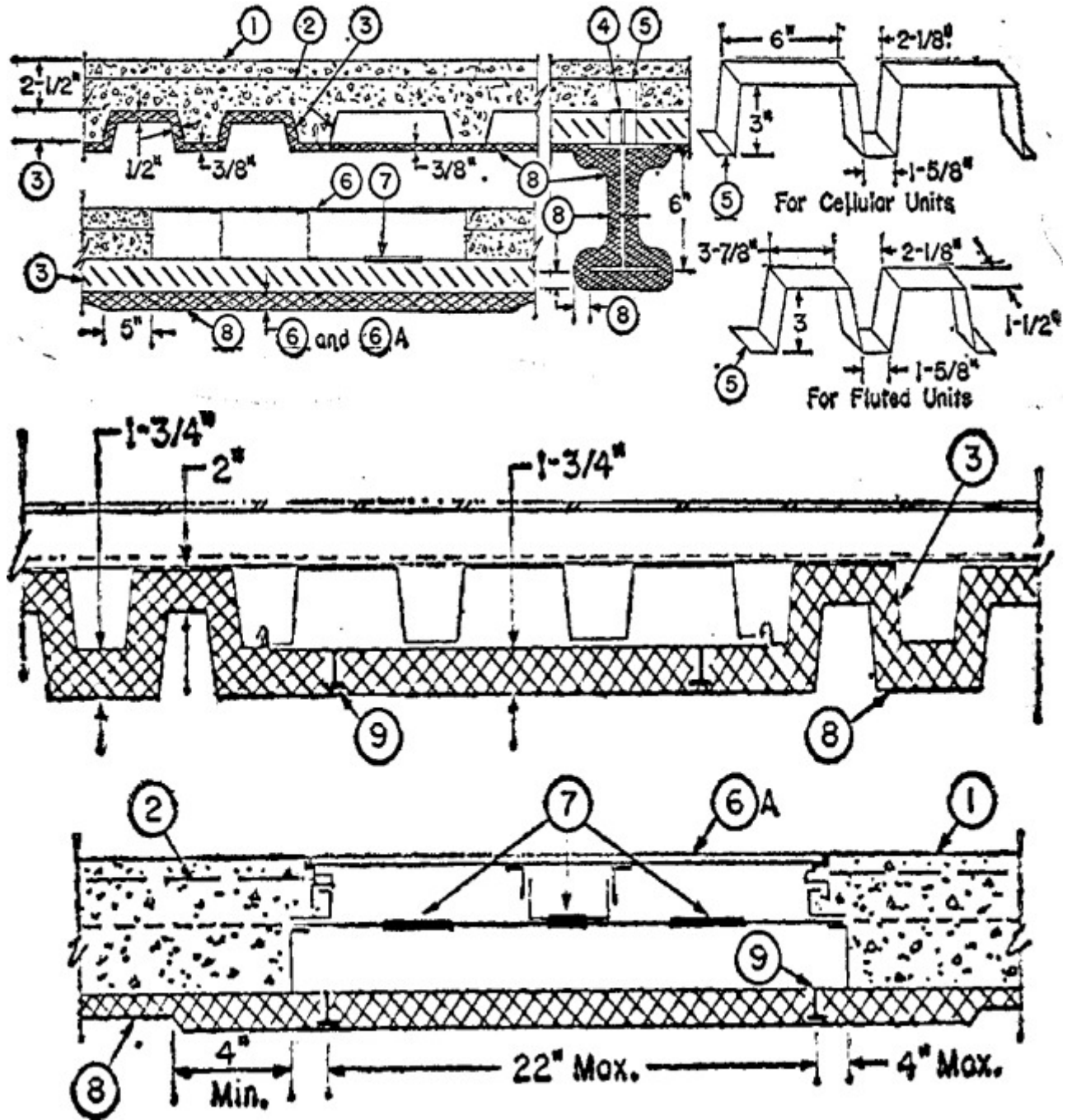
Restrained Assembly Ratings — 1, 1-1/2, and 2 Hr. (See Items 6A and 10)

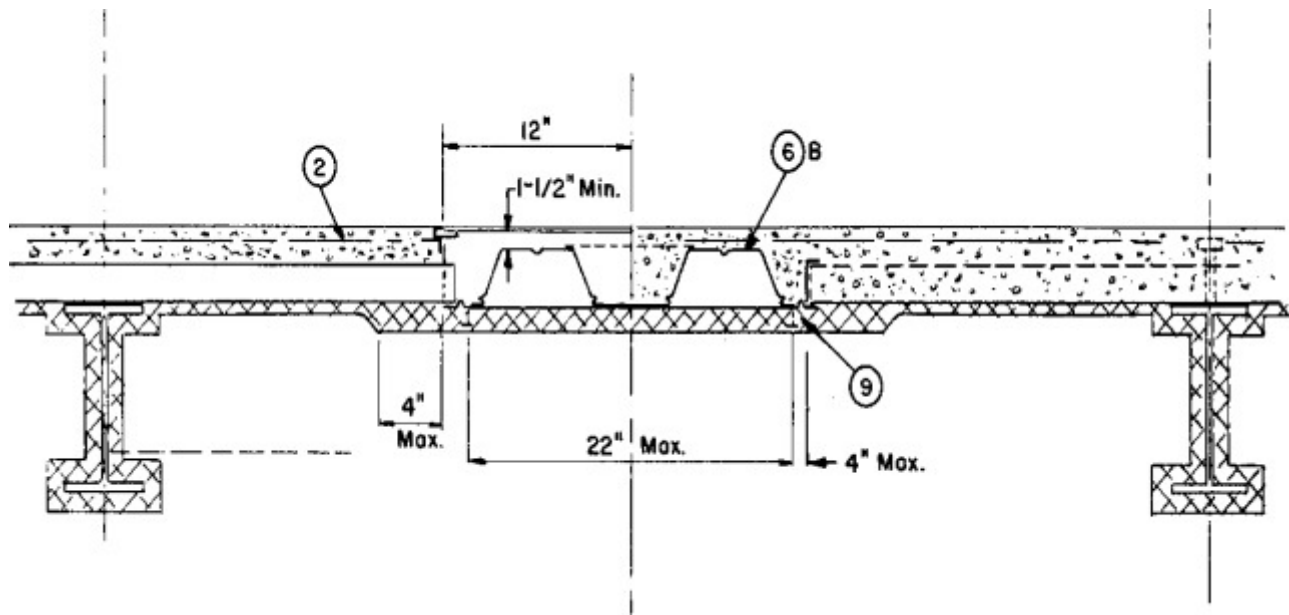
Unrestrained Assembly Ratings — 1, 1-1/2 and 2 Hr. (See Item 3)

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

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide [BXUV](#) or [BXUV7](#)

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**





Beam

— W6 x 12, min size.

1. Normal-Weight or Lightweight Concrete — Normal weight concrete, carbonate aggregate 145 +/- 3 pcf unit weight, 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 method, 112 pcf unit weight, 3000 psi compressive strength, vibrated, 4 to 7 percent entrained air.

2. Welded Wire Fabric — 6 x 6 — W1.4 x W1.4

3. Steel Floor and Form Units* — Composite or non-composite, 1-1/2, 1-5/8, 2 or 3 in. deep galv units. Alternating one 24 or 36 in. wide, 22 MSG min fluted unit to one 24, 30 or 36 in. wide, 20/18 MSG min cellular unit or all cellular units. Welded to supports 12 in. O.C. Unless noted otherwise, adjacent units button-punched or welded together 36 in. O.C. at side joints.

When the use of cellular steel deck exceeds a 1:1 blend with fluted deck, the max Restrained Assembly Rating is 2 Hr. and the max Unrestrained Assembly Rating is 1-1/2 Hr.

ASC STEEL DECK, DIV OF ASC PROFILES L L C — 32 in. wide Types NH-32, NHN-32, NHF-32, 2WH-36, 2WHS-36, 2WHF-36, 2WHF-36A, 3WxH-36, 3WxHF-36, 3WxHF-36A, 3WH-36, 3WHF-36, 3WHF-36A, 3W-36, 3WF-36, DG3W-36, DG3WF-36. All units may be galvanized or Prime Shield. Non-cellular decks may be vented designated with a "V" suffix to the product name.

CANAM GROUP INC — 36 in. wide Type P-3606 and P-3615 non-composite; 24 or 36 in. wide, Type LF3. Type LF3 may be phos/ptd.; 36 in. wide Types 1.5B, 1.5BI, 1.5BL and 1.5BL.

CANAM STEEL CORP — 36 in. wide Type P-3606 and P-3615 non-composite

KAM INDUSTRIES LTD, DBA CORDECK — QL Types, 24 in. wide, 2 in. 99, AKD, AKX, 21, NKX; 36 in. wide, 2 or 3 in. 99, AKD, AKX, WKD, WKX; 24 or 30 in. wide, 3 in. QL-GKX, -GKXH, -GKX-A.

CHIA TEH CONSTRUCTION MATERIAL CO LTD — 24 or 36 in. wide Mac-Lok 3; 24 in. wide CFD-3.

CANAM STEEL CORP — 24, 30 or 36 in. wide, Types 1-1/2 in. BL, BLC; 24 in. wide, Types LF2, LF3, LF15, LFC1, LFC2, LFC3; 36 in. wide, Types LF2, LF3, LFC2, LFC3; 24 in. wide, Types NL, NLC. Types BL, LF2, LF3, NL may be phos/ptd.

DECK WEST INC — 36 in. wide Type 2-DW or 3-DW.

DESIGN ASSISTANCE CONSTRUCTION SYSTEMS INC — 24 in. wide Type DACS2.0CD, or DACS3.0CD.

EPIC METALS CORP — 24 in. wide Types EC150, -300, -366, ECP150, -300, -366; 24 or 30 in. wide Types EPC2, EPC3; 36 in. wide Types EC266, ECP266.

KAM INDUSTRIES LTD, DBA CORDECK — Hi-Bond Types 24 in. wide 3KA1F24; 30 in. wide 3KF30, 3P30.

MARLYN STEEL DECKS INC — Type 1.5 CF, 2.0 CF or 3.0 CF.

NEW MILLENNIUM BUILDING SYSTEMS L L C — Type B, 1.5CD, 1.5CDR, 2.0CD or 3.0CD. Units may be phos/painted or galvanized.

STEEL MASTERS INTERNATIONAL DEPENDABLE STEEL — 36 in. wide Types 2WH-36, 3WH-36. Units may be phos/painted or galvanized.

VERCO DECKING INC - A NUCOR CO — FORMLOK™ deck types PLB, B, BR, PLN3, N3, PLN, N, PLW2, W2, PLW3, W3. Units may be galvanized or phos./ptd. Units may be cellular with the suffix "CD" added to the product name, respectively. All non-cellular deck may be vented or non-vented.

VULCRAFT, DIV OF NUCOR CORP — 24 or 36 in. wide, Types 2VLI, 2.0PLVLI, 2VLP, 2.0PLVLP, 3VLI, 3.0PLVLI, 3VLP, 3.0PLVLP. Types 2VLI, 2.0PLVLI, 3VLI, 3.0PLVLI units may be phos/ptd. 36 in. wide Types 1.5 SB, 1.5 SBR; 24 or 36 in wide Types 2.0 SB, 3.0 SB; 36 in. wide Type High Strength 1.5 SBI, 36 in. wide Type High Strength 1.5 SBN units may be phos/ptd.

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

4. **Joint Cover** — 2 in. wide, pressure-sensitive cloth tape.

5. **Shear-Connector** — (Optional) — Studs 3/4 in. diam by 3-1/2 in. long, headed type or equivalent, per AISC specifications. Welded to the top flange of beam through the deck.

6. **Trench Header** — (Bearing the UL Listing Mark). Housing constructed of steel with metal edge screeds. The Spray-Applied Fire Resistive Materials thickness on steel floor units beneath this trench header shall be 7/8 in. below the bottom plane of units with the flutes completely filled except for 2 and 3 in. deep floor units where the minimum thickness in the flutes shall be 1-1/8 in.

6A. **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, placed along the sides of the desired trench location and welded or riveted to the floor units. The side rails, consisting of extruded aluminum screeds secured to galvanized steel rails, consisting of extruded aluminum screeds secured to galvanized steel channels (min 18 MSG) are positioned over the cell closers, aligned and welded to the closers and floor units. A separate U shaped channel (min 18 ga) 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 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. **For 1 Hr Restrained Assembly Rating** the required fireproofing thicknesses are 1-3/16 in. in the crests and 1 in. on valleys and flat plates. **For 1-1/2 Hr Restrained Assembly Rating** the required fireproofing thicknesses are 1-1/2 in. in the crests and 1-1/4 in. on valleys and flat plates.

For 2 Hr Restrained Assembly Rating the required fireproofing thicknesses are 1-3/4 in. in the crests and 1-5/8 in. on valleys and flat plates. For 1 Hr Restrained Assembly Rating for assemblies consisting of 2 or 3 in. deep units, fire proofing thicknesses may be reduced to 1-1/2 in. in the crests and 1 in. on valleys and flat plates. These thicknesses shall extend a min of 4 in. beyond the edge of the trench header.

6B. **Feeder Duct System** — (As an alternate to Items 6 or 6A). Consists of 3 in. deep, nom 24 in. wide, 20/18 MSG Type QL-WKM or QM-WKM-E cellular steel floor unit (feeder unit) and nom 24 by 24 in. junction boxes. The valley between the two cells of the feeder

duct may or may not be covered by a steel plate to form a third cell. Feeder duct installed at the same elevation and perpendicular to 2 or 3 in. deep fluted and/or cellular steel floor units which are cantilevered from support beams on one or both sides of the feeder duct. The junction boxes consisting of extruded aluminum screeds, 18 galv steel outside flute closures, 16 galv steel compartment divider, and 0.21 in. thick steel cover plate are used at intersections of 2 or 3 in. cellular units and the feeder duct where desired. Bottom tabs of the flute closures are fastened to the valleys of the 2 or 3 in. units and to the feeder duct with self-drilling tek fasteners, while the cover plate is retained in position by four latch clips, one near each corner of the plate. The height and the level of the aluminum screed are adjusted by four adjustment screws, two each on opposite sides. In between the junction boxes the ends of the 2 or 3 in. fluted and/or cellular units are covered with steel end closure angles tack-welded to the top of the units. Welded wire fabric (Item 2) extends over the feeder duct between junction boxes. The allowable superimposed load for spans with the feeder duct system shall be based on noncomposite design. Steel studs with discs (Item 9) shall be welded to the underside of the feeder duct in two rows. The spacing between rows shall not exceed 22 in. O.C. and the spacing of studs in each row shall not exceed 24 in. O.C. The use of this feeder duct system requires additional protection underneath the feeder duct. For **2 Hr Restrained Assembly Rating** the required fireproofing thickness beneath the feeder duct is 1-3/4 in. For **1 Hr Restrained Assembly Rating** for assemblies consisting of 3 in. deep units, fire proofing thickness may be reduced to 1 in. These thicknesses shall extend a min of 4 in. beyond the edges of the feeder duct.

6C. Trench Header — With an intermittent bottom (as an alternate to Item 6 or 6A) — (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 24 in., consists of a horizontal closure plate (min. No. 22 MSG), over the fluted deck sections at the desired trench header location and affixed to the floor units by welding or screws (No. 14 by 3/4 in. long self-tapping, self-drilling). At the trench header where horizontal plates cover the fluted units, concrete is to be vibrated into the voids formed by the plate and fluted units. The side rails consist fo extruding aluminum screeds secured to the galv steel channels (min No. 18 MSG), positioned over the edge of the horizontal closure plates, aligned and welded to the cells and fluted floor units. A separate U-shaped galv steel channel (min No. 18 MSG), serving as the power compartment is welded to the horizontal closure plates and floor units. Steel cover plates 1/4 in. thick, shall be screw attached to the side rails. For **2 h or less Restrained Assembly Rating**, the required fireproofing thickness shall be 1-1/8 in. applied in conjunction with stud pins with discs below the trench header (see Item 9). **KAM INDUSTRIES LTD, DBA CORDECK** — 24 in. wide Type QL-WKM or QL-WKM-E.

7. Access Openings — As required, with grommets.

8. Spray-Applied Fire Resistive Materials* — Applied by mixing with water and spraying in more than one coat to a final thickness as shown above, to surfaces which must be clean and free of dirt, loose scale and oil. Min avg and min ind density of 15/14 pcf respectively. Min avg and min ind density of 19/18 pcf respectively for Type 7GP and 7HD. For method of density determination, refer to Design Information Section. Types 4, 5GP, 7GP, 7HD, 8GP, 9GP 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 Types DK, DK2, DK3, SK-1 or SK-III is required on all cellular units with flat plate on bottom, optional on other steel surfaces. Thickness of the spatter coat is included in the total final thickness of the protection material.

Mtl Thkns on Beam Thkns In.	Concrete	Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr
3/4	Light-weight	2 Hr	1 Hr	1 Hr
3/4	Normal-weight	2 Hr	1 1/2Hr	1 1/2 Hr
1 1/8	Normal-weight	2 Hr	2 Hr	2 Hr

For method of density determination see Design Information Section.

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

PYROK INC — Type LD.

SOUTHWEST FIREPROOFING PRODUCTS CO — Types 4, 5, 5EF, 5GP, 5MD, 7GP, 7HD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD, DK, DK2, DK3.

GCP APPLIED TECHNOLOGIES INC — Types MK-6/HY, MK-6s, Monokote Acoustic 1, RG, SK-III.

9. **Steel Studs With Discs** — The stud consists of No. 12 SWG 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 the rows shall not exceed 22 in. The spacing between studs in each row shall not exceed 24 in.

10. **Electrical Inserts** — (Not Shown) — Preset 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.

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

(1)**KAM INDUSTRIES LTD, DBA CORDECK** Inserts.

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 Spray Applied Fire Resistive Mtl Thk In.
(Tapmate II or II-EA)			
1	QL-AKX	NW	9/16
1	QL-WKX	NW or LW	1/2
1	QL-AKX	LW	5/8
2	QL-AKX, -WKX	NW	7/8
2	QL-AKX	LW	11/16
2	QL-WKX	LW	15/16
(Tapmate II-FN or II-EAFN)			
1	QL-AKX, -WKX	LW	1/2
11/2	QL-AKX, -WKX	LW	9/16
1 or 11/2	QL-AKX, -WKX	NW	3/8
2	QL-AKX, -WKX	LW	3/4
2	QL-AKX, -WKX	NW	1/2

The hole cut in insert cover for passage of wires shall be no more than 1/8 in. larger diam than 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 material thicknesses on floor units with inserts are:

Restrained Assembly Rating, Hr	Floor Unit Type	Concrete Type	Min Spray Applied Fire Resistive Mtl Thk In.
1 or 1-1/2	QL-WKX	NW	3/8
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 in QL-AKD or QL-WKD floor units. Inserts are used in the pre-active, active or abandoned condition. Required spray-applied resistive material 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, III-EAFN; Series KEC)			
1	QL-AKD, -WKD	LW	9/16
1-1/2	QL-AKD, -WKD	LW	5/8
1	QL-AKD, -WKD	NW	3/8
1-1/2	QL-AKD, -WKD	NW	7/16
2	QL-AKD, -WKD	LW	13/16
2	QL-AKD, -WKD	NW	1/2
(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, IV-H-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 material 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)			
1	QL-GKX	LW	9/16
1-1/2	QL-GKX	LW	5/8
1	QL-GKX	NW	3/8
1-1/2	QL-GKX	NW	7/16
2	QL-GKX	LW	13/16
2	QL-GKX	NW	1/2

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 VI)

Installed per accompanying installation instructions over factory-punched holes in 3 in. deep Type QL-GKX, 24 in. wide cellular steel floor units. 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.
1, 1-1/2	QL-GKX	LW, NW	3/8
2	QL-GKX	LW, NW	1/2

KAM INDUSTRIES LTD, DBA CORDECK — 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 VI.

(2) **Wiremold Co** and **Kam Industries LTD d/b/a Cordeck** Preset Inserts.

The NRG Bloc IV insert is furnished by KAM INDUSTRIES LTD d/b/a CORDECK. The service fitting components are furnished by Wiremold Co. Installed per accompanying installation instructions over factory-punched holes in 3 in. deep K-Type cellular steel floor units (furnished by KAM INDUSTRIES LTD d/b/a CORDECK). Either Type RAKM-II, FAKM-II, S36BB, S36CC, S36PB, S36PP, S38CC, S38BB, S38PB, S38PP, FPCTC, FPBTC, FPFPTC service fittings or Type S3AXBP abandonment plate 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, S3AXBP)			
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

WIREMOLD CO – Type N-R-G Bloc IV Series inserts; Type RAKM-II, FAKM-II, S36BB, S36CC, S36PB, S36PP, S38CC, S38BB, S38PB, S38PP, FPCTC, FPBTC, FPFPTC service fittings or Type S3AXBP abandonment plate.

11. **Metal Lath** – (Not Shown) – Where Type 7HD is applied to steel deck, 3/8 in. metal ribbed lath weighing 3.4 lb/yd² shall be secured to the underside of the steel deck (ribs upward) with S-12 by 3/8 in. long pan head, self-tapping steel screws spaced 12 in. OC in all directions. Steel screws shall be fitted with 1/2 in. diameter steel washers. Adjacent pieces of lath shall be overlapped 1 in. min.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

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