

FIRE-RESISTANCE DESIGN

Assembly Usage Disclaimer

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. D788

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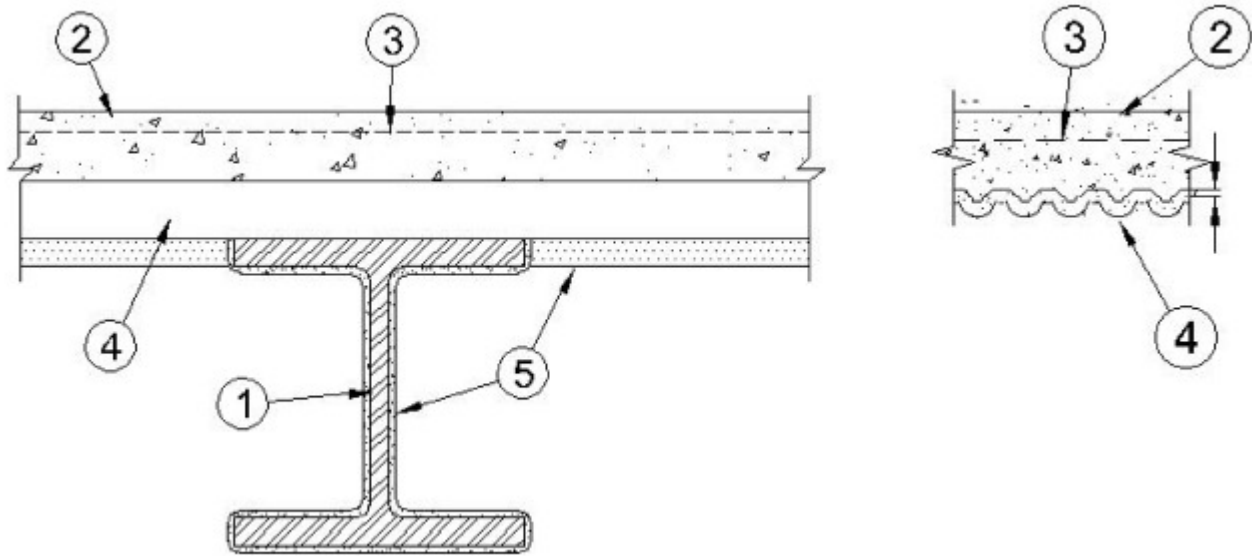
Restrained Assembly Ratings — 1, 1-1/2, 2, 3 or 4 Hr (See Items 1, 5)

Unrestrained Assembly Ratings — 1, 1-1/2, 2, 3 or 4 Hr(See Items 2, 5)

Unrestrained Beam Ratings — 1, 1-1/2, 2. 3, or 4 Hr (See Item 5)

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.**



1. **Support** — W8x28 min size steel beam or min. 10K1 steel joists.

2. **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 method, 3000 psi compressive strength, vibrated, 4 to 7 percent entrained air. Minimum 2-1/2 in. concrete thickness.

3. **Welded Wire Fabric** — 6x6 — 8/8 SWG.

4. **Steel Form Units*** — No. 28 MSG galv corrugated sheet steel min, 2-1/2 in. pitch and 1/2 in. depth of corrugations. Units welded to each joist, 36 welds per 100 sq ft of form units, with at least one weld at each joint.

4A. **Steel Form Units*** — (Not shown) — As an alternate to Item 3, 1-1/2 , 2, or 3 in. deep min. 22 gauge, fluted units, welded to the beam.

(1) all 18, 24, 26, 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 18, 24, 26, 28, or 36 in. wide cellular.

(5) 3 in. deep, 30 in. wide cellular with 8-1/8 in. wide valley along side 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 unit.

(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 STEEL DECK, DIV OF ASC PROFILES L L C — 32 in. wide Types NH-32, NHN-32, NHF-32; 36 in. wide Types BH-36, BHN-36, BHN-35-1/4, BHF-36, BHF-36A, 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 STEEL CORP — 36 in. wide Type P-3623, P-3606, P-3615 composite; 24 in. wide Type P-2432 composite.

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

CANAM STEEL CORP — 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 Cell; 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.

NEW MILLENNIUM BUILDING SYSTEMS L L C — 24 or 36 in. wide Types Mac-Lok 2, Mac-Lok 3; 24 in. wide, Types B2C, B2FC, NC, NFC; 30 in. wide Type B3C; 12 in. wide Mac-Way cellular 45 MOW, 2-633 MTWA, 3-633 MTWA, 2-633MTWV, 3-633MTWV+

DECK WEST INC — 36 in. wide Type B-DW, Inverted B-DW, BA-DW, Inverted BA-DW, 2-DW or 3-DW. Side joints of Type 2-DW and 3-DW may be fastened together with min 1 in. long No. 12 x 14 self-drilling, self-tapping steel screws 36 in. OC.

EPIC METALS CORP — 24 in. wide Types EC150, ECP150, EC300, ECP300, EC366, ECP366, EC150, EC300 inverted, 30 in. wide Types ECB150, ECBR150; 36 in. wide Type EC266.

GENS METALS INC — 24 or 36 in. wide Types LF2, LF3.

HAMBRO STRUCTURAL SYSTEMS, DIV OF CANAM STEEL CORP — 36 in. wide, 1-1/2 in. Type P3615HB. The max superimposed loadings for Type P3615HB units shall not 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. spans with a max total superimposed loading of 240 PSF.

H H ROBERTSON — QL Types, 24 in. wide 3 or 3 inverted, UKX, UKX-3, 2 in. 99, AKX, 21 or 21 inverted, 121, NKX, TKX; 24 or 30 in. wide GKX, GKXH, GKX-A; 36 in. wide 99, AKX, WKX; 24, 26, or 36 in. wide NKX; 1.5NKC, 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 QL, 99, 121, WKX, TKX, TKC, and Metric units - QL-77-900; QLC-78-900 may be welded together 60 in. OC. Side joints of 99, AKX, WKX, GKX, GKX-A, TKX and Metric units - QL-77-900 and QLC-78-900 may be fastened together with min 1 in. long No. 12x14 self-drilling, self-tapping steel screws 36 in. OC.

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

NEW MILLENNIUM BUILDING SYSTEMS L L C — 24 or 36 in. wide Types 2.0CD, 3.0CD, 2.0CFD, 3.0CFD, 3.0CFDES; 24, 30 or 36 in. wide Types 1.5CD, 1.5CDI, 1.5CDR, 1.5CFD. Fluted units may be phos/painted or galvanized.

ROOF DECK INC — 36 in. wide Types LOK 1 1/2, LOK 1 1/2 R; 24 in. wide Types LOK-2, LOK-3.

VALLEY JOIST — 24 or 36 in. wide Types WVC 1-1/2 or WVC 2.

VERCO DECKING INC - A NUCOR CO — Types PLB, HSB, PLN3, HSN3, PLN, N, and 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. 12 in. wide PLW2, W2, PLW3 or W3 units may be blended with 24 or in. wide PLW2, W2, PLW3 or W3 units, respectively.

VULCRAFT, DIV OF NUCOR CORP — 24, 30 or 36 in. wide, Types 1.5VL, 1.5VLI, 1.5VLP, 1.5VLR; 24 or 36 in. wide, Types 2VLI, 3VLI, 2VLP, 3VLP. Side joints of Type 1.5VL may be fastened together with min 1 in. long No. 12x14 self-drilling, self-tapping steel screws 36 in. OC max. Units may be phos/painted or galvanized.

WIREMOLD CO — 24 in. wide, Types 2 or 3 in. WDR.

5. Spray-Applied Fire Resistive Materials* — Applied by mixing with water and spraying in more than one coat to a final thickness as shown below to steel surfaces which must be 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, see Design Information Section, sprayed materials.

Min. Required SFRM Thickness					
Restrained Assembly	Unrestrained Assembly	Unrestrained Beam	Deck++	Joist Thickness	Joist Thickness Joist spacing 4 ft. OC spacing or less
1	1	1	3/8	3/4	9/16
1-1/2	1	1	3/8	13/16	13/16
1-1/2	1-1/2	1-1/2	3/8	1-3/16	15/16
2	1	1	3/8	1-5/16	1-1/4
2	2	2	3/8	1-5/8	1-1/4
3	3	3	11/16	2-9/16	2

Min. Required SFRM Thickness					
Restrained Assembly	Unrestrained Assembly	Unrestrained Beam	Concrete	Deck++	Beam Thickness
1	1	1	LW or NW	3/8	3/8
1-1/2	1	1	LW or NW	3/8	3/8
1-1/2	1-1/2	1-1/2	LW or NW	3/8	9/16
2	1	1	LW or NW	3/8	3/8
2	2	2	LW or NW	3/8	13/16
3	1-1/2	1-1/2	LW or NW	11/16	9/16
3	2	2	LW or NW	11/16	13/16
3	3	3	LW or NW	11/16	1-1/4
4	4	4	LW or NW	1-7/16	1-5/8

++ When 1.5 in. deep steel floor units are used thickness of SFRM in crests shall be a min. of 1/2in.

The thickness 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 by one-half and the beams are supporting solid concrete slabs or floor assemblies containing only fluted floor or form units.

W8x28 Half Flange Beam Thickness					
Restrained Assembly	Unrestrained Assembly	Unrestrained Beam	Concrete	Deck++	Half Flange Beam Thickness
1	1	1	LW or NW	3/8	3/8+
1-1/2	1	1	LW or NW	3/8	3/8+
1-1/2	1-1/2	1-1/2	LW or NW	3/8	9/16
2	1	1	LW or NW	3/8	3/8+
2	2	2	LW or NW	3/8	13/16
3	1-1/2	1-1/2	LW or NW	11/16	9/16
3	2	2	LW or NW	11/16	13/16
4	4	4	LW or NW	1-7/16	1-15/16

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

++ When 1.5 in. deep steel floor units are used thickness of SFRM in crests shall be a min. of 1/2in.

SOUTHWEST FIREPROOFING PRODUCTS CO — Types 4, 5, 5EF, 5GP, 5 AR, 5GP/AR, 5EF/AR, 5MD/AR, 5MD, 7GP, 7HD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD.

6. **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.

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.

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