



Design No. D929
BXUV.D929
Fire-resistance Ratings - ANSI/UL 263

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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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BXUV - Fire Resistance Ratings - ANSI/UL 263

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

[See General Information for Fire-resistance Ratings - ANSI/UL 263](#)

[See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada](#)

Design No. D929

December 04, 2015

Restrained Assembly Rating — 1, 1-1/2, 2, or 3 Hr

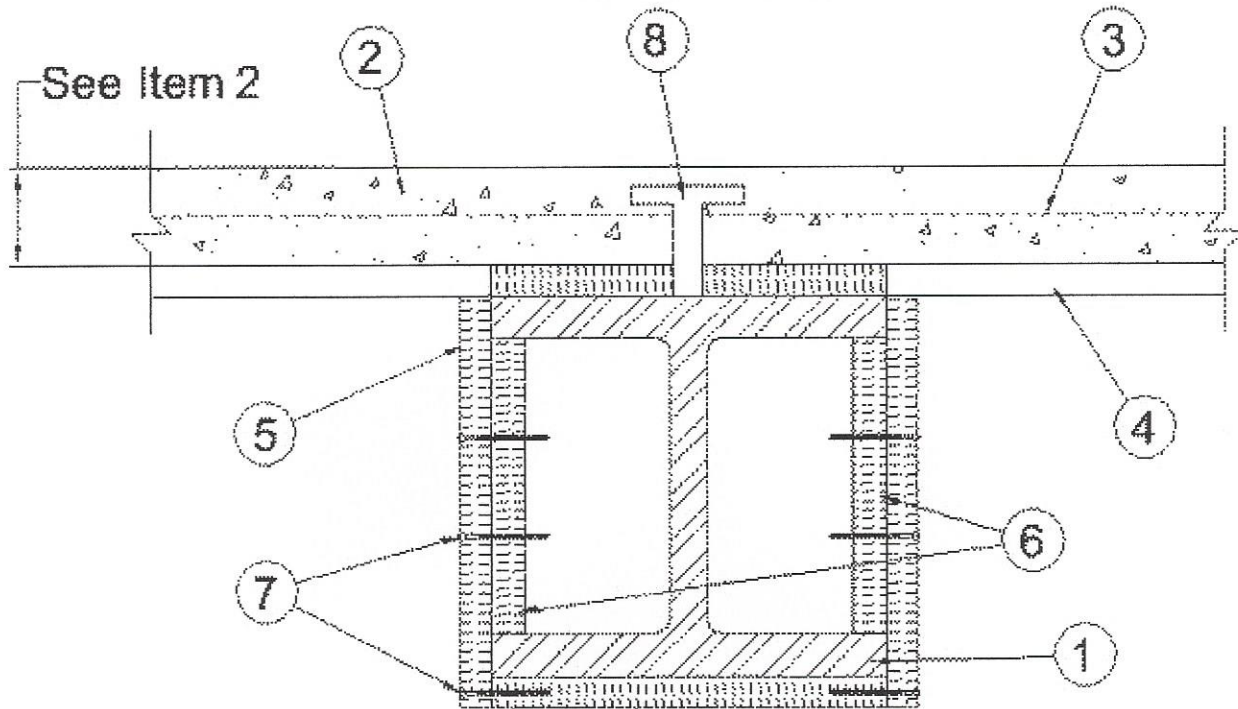
(See Items 1, 5, 9, 10, 14)

Unrestrained Assembly Ratings — 0 Hr (See Item 4 & 5)

Unrestrained Beam Ratings — 1, 1-1/2 or 2 Hr (See Items 5, 10 & 14)

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. **Supports** — W8x28 min size steel beams.

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.

Restrained Assembly Rating Hr	Concrete (Type)	Concrete Unit Weight pcf	Concrete Thkns 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.

3. **Welded Wire Fabric** — 6 x 6, 10 x 10 SWG.

4. **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 gauges are 22 MSG for fluted and 20/20 MSG for cellular units. The following combinations of units may be used:

- (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 that 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 2 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. Cellular deck top and bottom sections may be riveted together (designated with "Fr") vs. arc spot welded, "F".

CANAM STEEL CORP — 36 in. wide Type P-3623, P-3606 and P-3615 composite; 24 in. wide Type P2432 composite.

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, Type 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 in. wide, Types CFD-2, CFD-3; 24, 30 or 36 in. wide, Type CFD-1.5; 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+, 24 in. wide, Type Versa-Dek; 24 in. wide Type Versa-Dek Composite LS Acoustical, Type Versa-Dek Composite S Acoustical.

DESIGN ASSISTANCE CONSTRUCTION SYSTEMS INC — 36 in. wide Type DACS1.5CD, or 24 in. wide Type DACS2.0CD, or DACS3.0CD.

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

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, 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.

KAM INDUSTRIES LTD, DBA CORDECK — 24 in. wide, Types 2 or 3 in. WDR.

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

NEW MILLENNIUM BUILDING SYSTEMS L L C — Type 1.5CD, 1.5CDI, 2.0CD or 3.0CD. 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 — 24, 30 or 36 in. wide Types PLB, B, BR; 24 or 36 in. wide Types PLW2, W2, PLW3, W3; 24 in. wide Types PLN, N. 12 in. wide PLW2, W2, PLW3 or W3 units may be blended with 24 in. wide PLW2, W2, PLW3 or W3 units, respectively; or Types N3, PLN3. Units may be phos/ptd.

VULCRAFT, DIV OF NUCOR CORP — 24, 30 or 36 in. wide, Type 1.5 VL, 1.5VLI, 1.5PLVLI, 1.5VLP, 1.5PLVLP; 24 or 36 in. wide, Types 2VLI, 2.0PLVLI, 3VLI, 3.0PLVLI, 2VLP, 2.0PLVLP, 3VLP, 3.0PLVLP.

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 along side joints.

5. Mineral and Fiber Boards — Boards cut in various widths to be compatible with the size of beam being protected. Boards placed parallel with the flange of the beams being protected. Boards placed parallel with the flange of the beams are cut the width of the flange. Boards placed parallel with the web of the beams are cut the width of the beams (web side) plus twice the board thickness. The voids created by the flutes above the beam to be filled with mineral wool batts having a nom density of 4 lb per cu ft.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Mineral & Fiber Board Thkns In.
1	1	1	3/4
1-1/2	1	1	3/4
1-1/2	1-1/2	1-1/2	3/4
2	1	1	3/4
3	2	2	1-5/8

ALBI MFG, DIV OF STANCHEM INC — Type Dri-Clad.

6. Noggings — Min 1-1/2 in. thick, pieces of mineral and fiber board (See Item 5). Cut to friction fit between beam flanges.

7. Fasteners — The boards are fastened to the noggings and to each other by means of spiral type screws, spaced a max of 6 in. OC. The fasteners are installed on both sides of horizontal joints.

8. Shear — Connector Studs — Optional — Studs 3/4 in. diam by 3 in. long, for 1-1/2 in. deep form units to 5-1/4 in. long for 3 in. deep form units, headed type or equivalent per AISC specifications. Welded to the top flange of the beam through the steel form units.

9. Electrical Inserts — (Not shown) Classified as "Outlet Boxes and Fittings Classified for Fire Resistance".

H H ROBERTSON — Preset Inserts.

For use with 2-1/2 in. lightweight concrete topping over QL-WKX steel floor units. Installed over factory-punched holes in floor units per accompanying installation instructions. Spacing shall not be more than one insert in each 14 sq ft of floor area with spacing along floor units not less than 48 in. OC. The holes cut in insert cover for passage of wires shall be no more than 1/8 in. larger diam than wire. Restrained Assembly Rating is 3/4 hr with Tapmate II-FS-1 and 1 hr with Tapmate II-FS-2 inserts.

H H ROBERTSON — Tapmate II-FS-1, II-FS-2; Series KEB.

WIREMOLD CO — After set Inserts.

Single-service after set inserts installed per accompanying installation instructions in 2-1/2 in. diam hole core-drilled through min 3-1/4 in. thick concrete topping to top of cell of any min 3 in. deep cellular steel floor unit specified under Item 3. Spacing shall be no more than one insert in each 10 sq ft of floor area in each span with a min center to center spacing of 16 in. If the high potential and low potential raceways of the cellular steel floor unit are separated by a valley filled with concrete, the center to center spacing of the high potential and

low potential single-service after set inserts may be reduced to a min of 7-1/2 in. Restrained Assembly Rating is 2 hr or less with internally protected Type 436 after set insert with Type M4-, M6- or M8- Series single-service activation fitting.

WIREMOLD CO — Internally protected Type 436 after set insert with Type M4-, M6- or M8- Series single-service activation fitting.

10. Mineral and Fiber Boards* — (Optional, not shown. For use with the 3-1/4 in. lightweight concrete topping only) — Applied over concrete floor with no restriction on thickness. When the insulation is used, the Restrained Assembly Rating is reduced to 1-1/2 h.

See Mineral and Fiber Board (CERZ) category for names of manufacturers.

11. Roof Covering Materials* — (Optional, not shown) Consisting of materials compatible with insulation described herein which provide Class A, B or C coverings. See Built-Up Roof Covering Materials in Building Materials Directory.

12. Insulating Concrete — (not shown) Optional. Various types of insulating concrete prepared and applied in the thickness indicated:

A. Vermiculite Concrete — (not shown) Optional.

1. Blend 6 to 8 cu ft of Vermiculite Aggregate* to 94 lb Portland Cement and air entraining agent. Min thickness of 2 in. as measured to the top surface of the structural concrete or foamed plastic (Item 13) when it is used.

ELASTIZELL CORP OF AMERICA

GCP APPLIED TECHNOLOGIES INC

2. Blend 3.5 cu ft or Type NVS Vermiculite Aggregate* to 94 lb Portland Cement. Slurry coat, 1/8 in. thickness beneath foamed plastic (Item 10) when used, 1 in. min topping thickness.

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Vermiculite concrete may be covered with Roof Covering Materials (Item 11).

B. Cellular Concrete — Roof Topping Mixture* — Concentrate mixed with water and Portland cement per manufacturers specifications. Min. thickness of 2-in. as measured to the top surface of the structural concrete or foamed plastic (Item 13) when it is used. Cast dry density and 28-day min compressive strength of 190 psi as determined with ASTM C495-66.

CELCORE INC — Cast dry density of 31 (+ or -) 3.0 pcf.

AERIX INDUSTRIES — 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.

C. Perlite Concrete — 6 cu ft of Perlite Aggregate* to 94 lb of Portland Cement and 1-1/2 pt air entraining agent. Min thickness 2 in. as measured to the top surface of structural concrete or foamed plastic (item 10A) when it is used.

See Perlite Aggregate (CFFX) in Fire Resistance Directory for names of manufacturers.

D. Cellular Concrete-Roof Topping Mixture* — Foam Concentrate mixed with water, Portland Cement and UL Classified Vermiculite Aggregate 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.

AERIX INDUSTRIES — Mix No. 3.

13. Foamed Plastic* — For use with vermiculite or cellular concretes. Nom 24 by 48 in. polystyrene foamed plastic insulation boards having a density of 1.0 + 0.1 pcf encapsulated within vermiculite or cellular concrete topping (Items 12A or 12B). Each insulation board shall contain six nom 3 in. diam holes oriented in two rows of three holes each with the holes spaced 12 in. OC, transversely and 16 in. OC longitudinally.

See **Foamed Plastic* (BRYX)** category in Building Materials Directory or **Foamed Plastic* (CCVW)** category in Fire Resistance Directory for list of manufacturers.

14. Foamed Plastic* — (Optional, not shown. For use with 3-1/4 in. lightweight concrete topping only — Polyisocyanurate roof insulation, applied over concrete floor with no restriction on thickness. When the insulation is used the Restrained Assembly Rating is reduced to 1-1/2 h.

See Foamed Plastic (CCVW) category for list of manufacturers.

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