

# BXUV.D744

## 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. D744**

October 08, 2019

### **Restrained Assembly Rating — 2, 3 and 4 Hrs.**

**(See Item 9)**

### **Unrestrained Assembly Rating — 1, 1-1/2, 2 and 3 Hrs.**

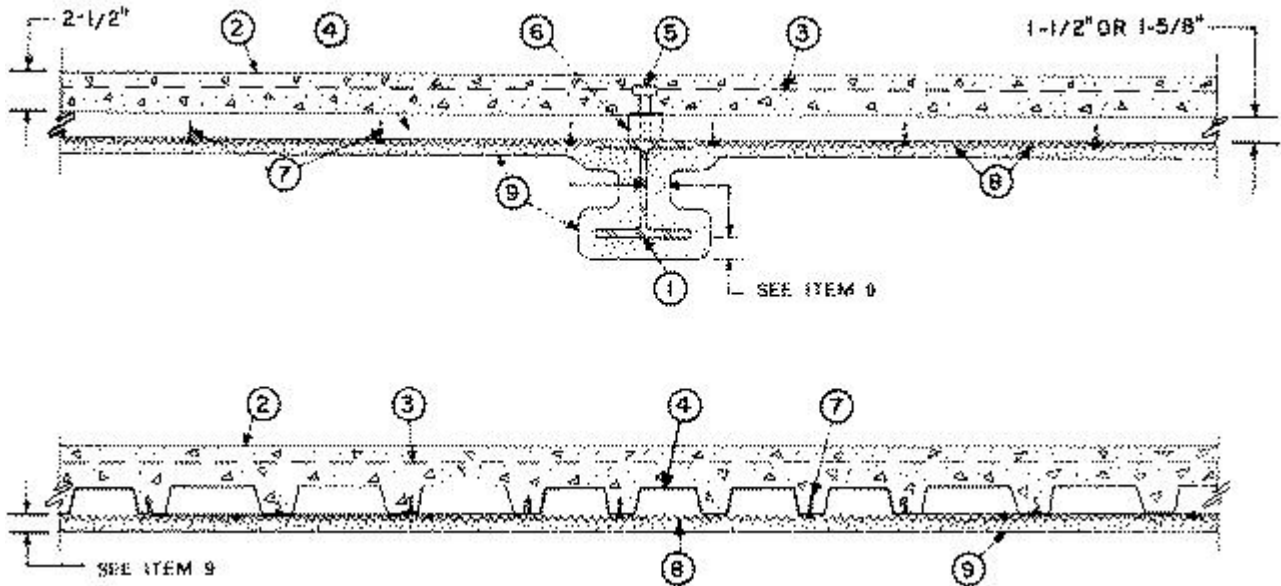
**(See Item 9)**

### **Unrestrained Beam Rating — 1, 1-1/2, 2, 3 and 4 Hrs.**

**(See Item 9)**

**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. **Steel Beam** — W6 x 15.5, min size.

2. **Normal Weight Concrete** — Normal weight concrete, carbonate or siliceous aggregate, 150 pcf unit weight, 4000 psi compressive strength. **Lightweight Concrete**— For use with item 9A. Expanded shale, clay or slate aggregate by rotary-kiln method, 116-120 pcf unit weight, 3000 psi compressive strength, vibrated. Min thickness as measured to crests of steel floor and form units, 2-1/2 in.

3. **Welded Wire Fabric** — 6 x 6 — W1.4 x W1.4.

4. **Steel Floor and Form Units\*** — Composite 1-1/2 or 1-5/8 in. deep galv units. Floor may consist of all fluted units, all cellular units or any combination of fluted and cellular units. Fluted units to be 24 in. wide, No. 22 MSG min. Cellular units to be 24 in. wide, No. 20/20 MSG min. Adjacent units buttoned punched together 36 in. O.C. at side joints. The cells of the cellular steel floor units shall not be penetrated by fasteners (Item 7).

5. **Shear Connector-(Optional)** — Studs, 3/4 in. diam by 3-7/8 in. long, headed type or equivalent per AISC Specification. Welded to top flange of beam through the floor units.

6. **Joint Cover** — 2 in. wide pressure sensitive cloth tape.

7. **Fasteners** — No. 12 by 1 in., Type AB, with high-low threads and a flat head. For powder actuated attachment, any standard concrete and steel fastener with a min length of 1-1/4 in., min shank diam of 0.145 in. and a min 1/16 by 1/2 in. diam washer. Fasteners spaced 12 in. O.C. in both direction to secure lath to floor units. Fasteners secured only to valley portion of the floor units and therefore shall not penetrate the cell areas of the cellular floor units.

8. **Metal Lath** — 3/8 in. diamond mesh, 2.5 lbs per sq yd painted or galv expanded steel. Adjacent pieces of lath overlapped 3 in.

9. **Spray-Applied Fire Resistive Materials\*** — Applied by mixing with water and spraying or troweling in one or more coats to a final thickness as shown in the table below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Thickness beneath floor units measured to face of lath. Min avg density of 38 pcf with min ind value of 35 pcf for Type 800. Min avg density of 44 pcf with min ind value of 40 pcf for Type M-II. Min avg density of 47 pcf, with min individual value of 43 pcf for Type M-II/P. Min avg density of 44 pcf with min ind value of 42 pcf for Type TG. For method of density determination, see Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor

2	1	1	1/2	5/8
2	2	2	3/4	5/8
3	1-1/2	1-1/2	5/8	5/8
3	3	3	1-1/16	5/8
4	2	2	3/4	5/8
4	3	3	1-1/16	5/8
4	3	4	1-1/2	5/8

**GREENTECH ASIA PACIFIC SDN BDH** — Types M-II, or M-II/P, investigated for exterior use.

**GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C** — Types M-II, M-II/P or TG. Types M-II, M-II/P and TG investigated for exterior use.

**ISOLATEK INTERNATIONAL** — Types 800, M-II, M-II/P or TG investigated for exterior use.

**NEWKEM PRODUCTS CORP** — Types M-II or TG. Types M-II and TG investigated for exterior use.

9A. **Alternate Spray-Applied Fire Resistive Materials\*** — Applied by mixing with water and spraying in one or more coats to a final thickness as described below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Thickness beneath floor units measured to face of lath. Min avg density of 41 pcf with min ind value of 37 pcf. For method of density determination, see Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In. for NW concrete		Min Thk of Spray Applied Fire Resistive Mtl In. for LW concrete	
			Beam	Beneath Floor	Beam	Beneath Floor
2	1	1	11/16	7/8	15/16	1-1/8
3	1-1/2	1-1/2	1	7/8	1-3/16	1-1/8
4	2	2	1-1/4	7/8	1-3/8	1-1/8
4	3	3	1-9/16	7/8	1-7/8	1-1/8
4	3	4	2-1/8	7/8	2-3/8	1-1/8

**PYROK INC** — Types HD, HDR and Acoustement 40, investigated for exterior use.

9B. **Alternate Spray-Applied Fire Resistive Materials\*** — Applied by mixing with water and spraying in one or more coats to a final thickness as described below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Thickness beneath floor units measured to face of lath. Min avg density of 33 pcf with min ind value of 30 pcf. For method of density determination, see Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor

2	1	1	11/16	7/8
3	1-1/2	1-1/2	1	7/8
4	2	2	1-1/4	7/8
4	3	3	1-5/8	7/8
4	3	4	1-15/16	7/8

**PYROK INC** — Types MD, MDR and Acoustement 30, investigated for exterior use.

9C. **Alternate Spray-Applied Fire Resistive Materials\*** — Applied by mixing with water and spraying in one or more coats to a final thickness as described below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Thickness beneath floor units measured to face of lath. Min avg and min ind density of 15/14 pcf respectively for Types 4, 5, 5EF, 5GP, 5MD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD, MK-10 HB, MK-10 HB Extended Set, LD, MK-6/ED, MK-6/CBF, MK-6/HY, MK-6s, RG. Min avg and min ind density of 19/18 pcf for Types 7GP, 7HD, 105. Min avg and min ind density of 22/19 pcf for Types KM-601, Z-106, Z-106/G, Z-106/HY. For method of density determination, see Design Information Section.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor
4	3	3	1-1/2	3/4

**ARABIAN VERMICULITE INDUSTRIES** — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6/HB, MK-10 HB, MK-10 HB Extended Set, MK-6s, Z-106, Z-106/G, Z-106/HY.

**GCP KOREA INC** — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6/HB, MK-10 HB, MK-10 HB Extended Set, MK-6s, Monokote Acoustic 1, Monokote Acoustic 5, Z-106, Z-106/G, Z-106/HY.

**PYROK INC** — Type LD.

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

**GCP APPLIED TECHNOLOGIES INC** — Types 105, MK-6/HY, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, Monokote Acoustic 1, RG, Monokote Acoustic 5, Z-106, Z-106/G, Z-106/HY.

9D. **Alternate Spray-Applied Fire Resistive Materials\*** — Prepared by mixing with water according to instructions on each bag of material and spray or trowel applied in one or more coats to final minimum thicknesses shown below. Steel surfaces must be clean and free of dirt, loose scale and oil. Where lath is present thicknesses are to be measured to face of lath. Min. avg. density of 28 pcf with min ind density of 25 pcf for the Type 239. The min average density of 40 pcf with a min individual density of 37 pcf for the Type 40 and 40T. For method of density determination, see Design Information Section. Surface of material may be lightly finished with a trowel.

The thicknesses shown below are applicable when metal lath (Item 10) is used:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor
2	1	1	11/16	7/8

3	1-1/2	1-1/2	1	7/8
4	2	2	1-1/4	7/8
4	3	3	1-5/8	7/8
4	3	4	1-15/16	7/8

The thicknesses shown below are applicable when metal lath (Item 10) is omitted:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor
2	1	1	1-1/16	7/8
3	1-1/2	1-1/2	1-3/8	7/8
4	2	2	1-5/8	1-5/8
4	3	3	2	7/8
4	3	4	2-5/16	7/8

**CARBOLINE CO** — Type 40, Type 239. Investigated for exterior use.

**CARBOLINE (INDIA) PVT LTD** — Type 40, Type 239. Investigated for exterior use.

**PERLITA Y VERMICULITA SLU** — Type 40, 40T, Type 239. Investigated for exterior use.

**STONCOR MIDDLE EAST L L C** — Type 40, Type 239. Investigated for exterior use.

**STONCOR SOUTH CONE S A** — Type 40, Type 239. Investigated for exterior use.

9E. **Alternate Spray-Applied Fire Resistive Materials\*** — Prepared by mixing with water according to instructions on each bag of material and spray or trowel applied in one or more coats to final minimum thicknesses shown below. Steel surfaces must be clean and free of dirt, loose scale and oil. Where lath is present thicknesses are to be measured to face of lath. Min. avg. density of 50 pcf with min ind density of 45 pcf. For method of density determination, see Design Information Section. Surface of material may be lightly finished with a trowel.

The thicknesses shown below are applicable when metal lath (Item 10) is used:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor
2	1	1	11/16	7/8
3	1-1/2	1-1/2	1	7/8
4	2	2	1-1/4	7/8
4	3	3	1-5/8	7/8
4	3	4	1-15/16	7/8

The thicknesses shown below are applicable when metal lath (Item 10) is omitted:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor
2	1	1	15/16	7/8
3	1-1/2	1-1/2	1-1/4	7/8
4	2	2	1-1/2	7/8
4	3	3	1-7/8	7/8

**CARBOLINE CO** — Type 240. Investigated for exterior use.

**STONCOR SOUTH CONE S A** — Type 240. Investigated for exterior use.

9F. **Alternate Spray-Applied Fire Resistive Materials\*** — Prepared by mixing with water according to instructions on each bag of material and spray or trowel applied in one or more coats to final minimum thicknesses shown below. Steel surfaces must be clean and free of dirt, loose scale and oil. Where lath is present thicknesses are to be measured to face of lath. Min. avg. density of 55 pcf with min ind density of 50 pcf. For method of density determination, see Design Information Section. Surface of material may be lightly finished with a trowel.

The thicknesses shown below are applicable when metal lath (Item 10) is used:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor
2	1	1	11/16	7/8
3	1-1/2	1-1/2	1	7/8
4	2	2	1-1/4	7/8
4	3	3	1-5/8	7/8
4	3	4	1-15/16	7/8

The thicknesses shown below are applicable when metal lath (Item 10) is omitted:

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Thk of Spray Applied Fire Resistive Mtl In.	
			Beam	Beneath Floor
2	1	1	15/16	7/8
3	1-1/2	1-1/2	1-1/4	7/8
4	2	2	1-1/2	7/8
4	3	3	1-7/8	7/8

**CARBOLINE CO** — Type 241, Type 241 HD. Investigated for exterior use.

**CARBOLINE (INDIA) PVT LTD** — Type 241, Type 241 HD. Investigated for exterior use.

**PERLITA Y VERMICULITA SLU** — Type 241, Type 241 HD. Investigated for exterior use.

**STONCOR MIDDLE EAST L L C** — Type 241, Type 241 HD. Investigated for exterior use.

**STONCOR SOUTH CONE S A** — Type 241, Type 241 HD. Investigated for exterior use.

10. **Metal Lath** — (Optional-See tables in Items 9F, 9G and 9H) — 3,4 lb/sq yd galv or painted expanded steel applied only to bottom flange of beam. Secured by bending tight around flange a minimum of 1-1/2 in. toward web of beam.

11. **Metal Lath** — (Not Shown) — Where Type 7HD is applied to steel deck, 3/8 in. metal ribbed lath weighing 3.4 lb/yd<sup>2</sup> 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.**

Last Updated on 2019-10-08

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