

BXUV.N761 - FIRE-RESISTANCE RATINGS - ANSI/UL 263

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. N761

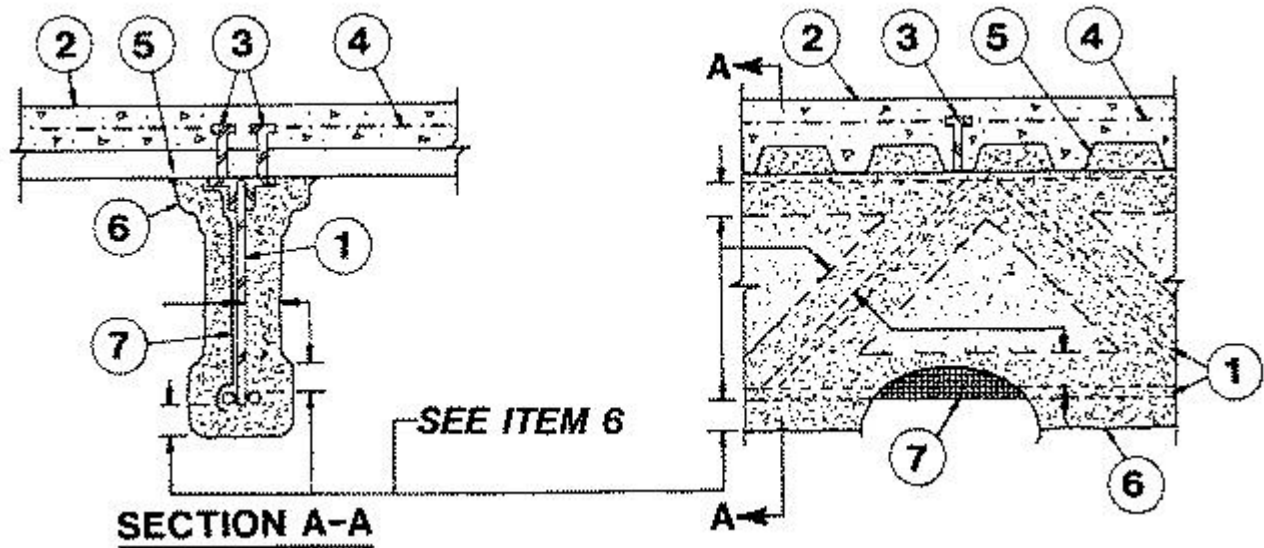
May 30, 2017

Restrained Beam Ratings — 1, 1-1/2, 2 and 3 Hr.

Unrestrained Beam Ratings — 1, 1-1/2, 2 and 3 Hr.

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 Joist — Composite or non-composite min 12k5 or min depth and weight shall be 12 in. and 7.1 lb/ft respectively. May be uncoated or provided with a shop coat of paint. Designed per S.J.I. specifications for a max design stress of 30,000 psi (30 ksi). Welded or bolted to end supports. Top chords shall consist of two angles measuring 1-1/2 by 1-1/2 by 0.156 in. thick. Bottom chord shall consist of two round bars measuring 0.675 in. in diam. or two angles measuring 1 by 1 by 0.125 in. thick. The second web member at each end shall consist of a 0.654 in. diam round bar. All remaining web members, including the end web members, shall consist of 0.774 in. diam round bars. Bridging per S.J.I. specifications is required when noncomposite joists are used.

1A. Steel Joists — (Not shown) — As an alternate to Item 1 — Composite or non-composite min 8k1 or min depth and weight shall be 8 in. and 4.9 lb/ft respectively. May be uncoated or provided with a shop coat of paint. Designed per S.J.I. specifications for a max design stress of 30,000 psi (30 ksi). Welded or bolted to end supports. The top chords shall consist of two angles measuring 1-1/4 by 1-1/4 by 0.127 in. thick. Bottom chords shall consist of two round bars measuring 0.566 in. in diam. Bearing plates shall consist of two angles measuring 1-1/2 by 2 by 0.188 in. thick and 5-1/16 in. long. Web members shall consist of 0.565 in. diam bars.

1B. Steel Joists — (Not shown) — As an alternate to Item 1 — Composite or non-composite min 10k1 or min depth and weight shall be 10 in. and 5.1 lb/ft respectively. May be uncoated or provided with a shop coat of paint. Designed per S.J.I. specifications for a max design stress of 30,000 psi (30 ksi). Welded or bolted to end supports. The top chords shall consist of two angles measuring min 1-1/2 by 1-1/2 by 0.128 in. thick. Bottom chords shall consist of two angles measuring min 1 by 1 by 0.110 in. thick. Bearing plates shall consist of two angles measuring min 1-1/2 by 1-1/2 by 0.153 in. thick and shall be min 5 in. long. All web members, including the end web members shall consist of min 0.564 round bars. Bridging per S.J.I. specifications is required when non-composite joists are used.

2. Normal Weight or Lightweight Concrete — 2-1/2 in. thick, min compressive strength of 3000 psi. For normal weight concrete, either carbonate or siliceous aggregate may be used. Unit weight, 145 +/-3 pcf. For lightweight concrete, unit weight may range from 104 to 120 pcf.

3. Shear Connector — (Optional) — Studs, min 1/2 in. diam headed type or equivalent per A.I.S.C. specifications. Welded to the top chord of joists through the steel floor units. Stud welding, as recommended by the stud manufacturer, should be followed.

4. Welded Wire Fabric — Min 6x6-W1.4xW1.4.

5. Steel Floor and Form Units — 1-1/2 to 3 in. deep corrugated, fluted or cellular units welded to joists.

6. Spray-Applied Fire Resistive Materials* — Prepared by mixing with water. Spray-applied in one or more coats to joist surfaces to a min final thickness as shown in the table below. Joist surfaces must be clean and free of dirt, loose scale and oil. Crest areas of deck above the joist shall be filled with Spray-Applied Fire Resistive Materials. When metal lath (Item 7) is used on joist, Spray-Applied Fire Resistive Materials is to be applied over lath with no min thickness requirement.

Min average density of 15 pcf and min individual density of 14 pcf for Type 300, 300AC, SB, 300ES, 300HS, 300N, 3000 and 3000ES. For Types 400, 400AC and 400ES min average and min individual density of 22 and 19 pcf, respectively. Min avg density of 44 pcf with min ind value of 40 pcf for Types M-II and TG. Min avg density of 47 pcf, with min individual value of 43 pcf for Type M-II/P. For method of density determination, see Design Information Section, Sprayed Material.

| | | |
|------------|--|-------------------|
| Rating, Hr | Normal Weight Concrete, Fluted Floor and Form Units, Min Thkns In. | |
| | Restrained Beam | Unrestricted Beam |

| | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist |
|-------|----------------------|----------------------|-----------------------|----------------------|----------------------|-----------------------|
| 1 | 9/16+ | 1 | 3/4 | 9/16+ | 1 | 3/4 |
| 1-1/2 | 1 | 1 | 3/4 | 1 | 1-9/16 | 1-1/8 |
| 2 | 1-3/8 | 1-5/8 | 7/8 | 1-3/8 | 2-1/16 | 1-9/16 |
| 3 | 2-1/4 | NR | 1-1/2 | 2-1/4 | NR | 2-5/16 |

Rating, Hr

Lightweight Concrete, Fluted Floor and Form Units, Min Thkns In.

Restrained Beam

Unrestrained Beam

| | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist |
|-------|----------------------|----------------------|-----------------------|----------------------|----------------------|-----------------------|
| 1 | 9/16+ | 1-1/8 | 15/16 | 9/16+ | 1-1/8 | 15/16 |
| 1-1/2 | 1 | 1-5/16 | 15/16 | 1 | 1-3/4 | 1-3/8 |
| 2 | 1-3/8 | 2-1/16 | 1-1/8 | 1-3/8 | 2-1/4 | 1-7/8 |
| 3 | 2-1/4 | NR | 1-15/16 | 2-1/4 | NR | 2-7/8 |

Rating, Hr

Normal Weight Concrete, Cellular or Corrugated Form Units, Min Thkns In.

Restrained Beam

Unrestrained Beam

| | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist |
|-------|----------------------|----------------------|-----------------------|----------------------|----------------------|-----------------------|
| 1 | 9/16+ | 1 | 15/16 | 9/16+ | 1 | 15/16 |
| 1-1/2 | 1 | 1 | 15/16 | 1 | 1-9/16 | 1-1/4 |
| 2 | 1-3/8 | 1-5/8 | 1-1/8 | 1-3/8 | 2-1/16 | 1-9/16 |
| 3 | 2-1/4 | NR | 1-15/16 | 2-1/4 | NR | 2-9/16 |

Rating, Hr

Lightweight Concrete, Cellular or Corrugated Form Units, Min Thkns In.

Restrained Beam

Unrestrained Beam

| | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist | Item 1 12K5 Joist | Item 1A 8K1 Joist | Item 1B 10K1 Joist |
|-------|----------------------|----------------------|-----------------------|----------------------|----------------------|-----------------------|
| 1 | 9/16+ | 1-1/8 | 1-1/16 | 9/16+ | 1-1/8 | 1-1/16 |
| 1-1/2 | 1 | 1-5/16 | 1-3/16 | 1 | 1-3/4 | 1-1/2 |
| 2 | 1-3/8 | 2-1/16 | 1-7/16 | 1-3/8 | 2-1/4 | 1-13/16 |
| 3 | 2-1/4 | NR | 2-1/2 | 2-1/4 | NR | 2-7/8 |

NR = No Rating.

+ When bottom chords consist of 1 by 1 by 0.125 in. thick steel angles, the thickness of spray-applied fire resistive material shall be increased to 13/16 in. on the bottom chord only.

BERLIN CO LTD — Types 300, 300ES, 300N, or SB; Types M-II, TG, and M-II/P.

GREENTECH THERMAL INSULATION PRODUCTS MFG CO L L C — Types 300, 300AC, 400, or 400AC; Types M-II, TG, and M-II/P.

ISOLATEK INTERNATIONAL — Types 300, 300AC, 300ES, 300HS, 300N, SB, 400, 400AC, 400ES, 3000, or 3000ES; Types M-II, TG, and M-II/P.

NEWKEM PRODUCTS CORP — Types 300, 300ES, 300N, SB or 400, types M-II, TG, and M-II/P.

6B. **Spray-Applied Fire Resistive Materials*** — As an alternate to Item 6 - Prepared by mixing with water. Spray-applied in one or more coats to joist surfaces to a min final thickness as shown in the table below. Joist surfaces must be clean and free of dirt, loose scale and oil. Crest areas of deck above the joist shall be filled with Spray-Applied Fire Resistive Materials. When metal lath (Item 7) is used on joist, Spray-Applied Fire Resistive Materials is to be applied over lath with no min thickness requirement. Min avg density of 17.5 pcf with min ind density of 16 pcf for Type 300TW. Min avg density of 18 pcf and min ind density of 17 pcf for Type 280. For method of density determination, see Design Information Section, Sprayed Material.

Normal Weight Concrete

Min Thkns of Spray Applied Fire Resistive Mtl In.

| Rating Hr | Unrestrained Steel Joist Rating | | Restrained Steel Joist Rating | |
|-----------|---------------------------------|---------|-------------------------------|---------|
| | Item 1 | Item 1A | Item 1 | Item 1A |
| 1 | 9/16+ | 1 | 9/16+ | 1 |
| 1-1/2 | 1 | 1-9/16 | 1 | 1 |
| 2 | 1-3/8 | 2-1/16 | 1-3/8 | 1-5/8 |
| 3 | 2-1/4 | NR | 2-1/4 | NR |

+ When bottom chords consist of 1 by 1 by 0.125 in. thick steel angles, the thickness of spray-applied fire resistive material shall be increased to 13/16 in. on the bottom chord only.

Lightweight Concrete

Min Thkns of Spray Applied Fire Resistive Mtl In.

| Rating Hr | Unrestrained Steel Joist Rating | | Restrained Steel Joist Rating | |
|-----------|---------------------------------|---------|-------------------------------|---------|
| | Item 1 | Item 1A | Item 1 | Item 1A |
| 1 | 9/16+ | 1-1/8 | 9/16+ | 1-1/8 |
| 1-1/2 | 1 | 1-3/4 | 1 | 1-5/16 |
| 2 | 1-3/8 | 2-1/4 | 1-3/8 | 2-1/16 |
| 3 | 2-1/4 | NR | 2-1/4 | NR |

NR = No Rating.

+ When bottom chords consist of 1 by 1 by 0.125 in. thick steel angles, the thickness of spray-applied fire resistive material shall be increased to 13/16 in. on the bottom chord only.

ISOLATEK INTERNATIONAL — Types 280, 300TW.

7. **Metal Lath** — (Optional — Not shown) — 3/8 in. diamond mesh, expanded steel weighing min 2.5 lb/sq yd, secured to one side of joist using No. 16 SWG steel tie wire located at mid-height of every other web. When used, the metal lath must be fully covered with Spray-Applied Fire Resistive Materials with no min thickness requirements for material applied onto the lath between chords and web members.

7A. **Glass Fiber Mesh** — (Optional — Not shown) — As an alternate to metal lath (Item 7) — Min 3/32 in. square mesh, coated fiberglass scrim fabric, weighing a min of 1.9 oz per sq yd, polypropylene fabric mesh, weighing approximately 1.25 oz per sq yd or equivalent shall be attached to one side of each joist web member. The method of attachment must be sufficient to hold the mesh and fire protection material during application and curing of the material. . An acceptable method of attaching the mesh is by embedding the mesh in min

1/4 in. long beads of hot melted glue. The beads shall be spaced max 12 in. OC along the top chord of the joists. Another method of attachment is by 1-1/4 in. long by 1/2 in. wide hairpin clips formed from 0.064 in. diam steel wire, alternating from the top and bottom of the joist web member.

*** 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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