

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. H521

November 12, 2019

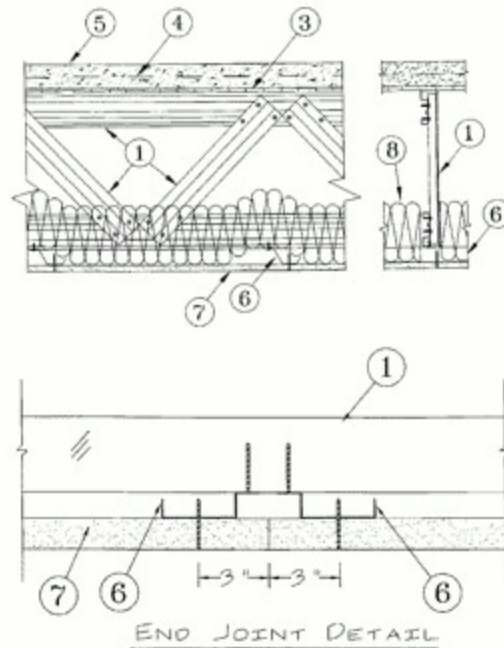
Restrained Assembly Rating - 2 Hr.

Unrestrained Assembly Rating - 2 Hr.

Unrestrained Beam Rating - 2 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. **Structural Steel Members*** — Pre-fabricated light gauge steel truss system consisting of cold-formed, steel chord and web sections. Trusses fabricated in various sizes, depths, and from various steel thickness. Trusses spaced a max of 48 in. OC.

AEGIS METAL FRAMING, DIV OF MITEK — Ultra-Span, Pre-fabricated Light Gauge Steel Truss System

2. **Bridging** — (Not Shown) — Location of lateral bracing for truss chord and web sections to be specified on truss engineering.

3. **Metal Lath** — 3/8 in. rib, 3.4 lb. per sq. yd expanded steel lath tied to each truss at every other rib and midway between trusses at side laps with 18 SWG galv. steel wire. As an alternate, the form material for the concrete may be corrugated steel deck, min 9/16 in. deep, 28 MSG galv. steel, mechanically fastened to trusses 15 in. OC. The concrete topping thickness shall be measured to the top plane of the steel deck.

3A. **Steel Form Units** — As an alternate to Item 3 - Min. 19/32 in. deep, 30 in. wide corrugated steel deck. Crests 1/2 in. wide, pitch 2-9/16 in., No. 28 MSG (0.018 in. thick) galvanized steel. Overlapped one corrugation at each side and attached to each joist with 5/8 in. long Type S-12 steel screws at each side joint and not more than 12-3/8 in. OC between sides. Concrete thickness measured at crests of steel deck.

4. **Welded Wire Fabric** — 6 by 6 in., 10/10 SWG.

5. **Normal Weight or Lightweight Concrete** — Carbonate or siliceous aggregate, 150 + or - 3 pcf unit weight, 3000 psi compressive strength. Lightweight concrete, expanded shale, clay or slate aggregate by rotary kiln method, 117 + or - 3 pcf unit weight, 3000 psi compressive strength. Min. thickness is 2 in.

6. **Furring Channels** — Hat channels min 25 MSG galv. steel, min 2-5/8 in. wide by min 7/8 in. deep, installed perpendicular to the trusses (Item 1), spaced a max of 12 in. OC when batts and blankets (item 8) or loose fill material (item 8A) are used and a max of 16 in. OC when they are not. Two courses of channel positioned 6 in. OC, 3 in. on each side of gypsum board end joints. Channel splices overlapped 4 in. beneath steel trusses. Channels secured to each truss with No. 18 SWG steel wire double strand saddle ties.

6A. **Steel Framing Members** — (Not Shown) As an alternate to Item 6:

- a. **Main runners** — Installed perpendicular to Structural Steel Members — Nom 10 or 12 ft long, 5/16 in. or 1-1/2 in. wide face, spaced 4 ft OC. Main runners hung a min of 2 in. from bottom chord of Structural Steel Members with 12 SWG galv. steel wire. Wires located a max of 48 in. OC.

b. **Cross tees or channels** — Nom 4 ft long, 15/16 in. or 1-1/2 in. wide face or cross channels, nom 4 ft long, 1-1/2 in. wide face, installed perpendicular to the main runners, spaced 16 in. OC. Additional cross tees or channels used at 8 in. from each side of butted gypsum board end joints. The cross tees or channels may be riveted or screw-attached to the wall angle or channel to facilitate the ceiling installation.

c. **Wall angles or channels** — Used to support steel framing member ends and for screw-attachment of the gypsum board — Min 0.016 in. thick painted or galvanized steel angle with 1 in. legs or min. 0.016 in. thick painted or galvanized steel channel with a 1 by 1-1/2 by 1 in. profile, attached to walls at perimeter of ceiling with fasteners 16 in. OC.

USG INTERIORS LLC — Type DGL or RX.

6B. **Alternate Steel Framing Members*** — (Not Shown) - As an alternate to Item 7A - Not for use with Items 8 or 8A - Main runners nom 12 ft long, spaced 72 in. OC. Main runners suspended by min 12 SWG galv. steel hanger wires spaced 48 in. OC. Cross tees, nom 6 ft long, installed perpendicular to main runners and spaced 24 in. OC. Additional 6 ft long cross tees required at each gypsum board end joint with butted gypsum board end joints centered between cross tees spaced 8 in. OC. The main runners and cross tees may be riveted or screw attached to the wall angle or channel to facilitate the ceiling installation.

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6C. **Steel Framing Members*** — (Not Shown) — As an alternate to Items 6, furring channels and Steel Framing Members* as described below:

a. **Furring Channels** — Formed of No. 25 MSG galv. steel, 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, installed perpendicular to the trusses (Item 1), spaced a max of 12 in. OC when batts and blankets (Item 8) or loose fill material (Item 8A) are used and a max of 16 in. OC when they are not. Channels secured to trusses as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 SWG galv. steel wire near each end of overlap.

b. **Steel Framing Members*** — Used to attach furring channels (Item a) to the steel joists (Item 1). Clips spaced a max of 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to alternating joists with No. 8 x 2-1/2 in. coarse drywall screw through the center grommet. Furring channels are friction fitted into clips. RSIC-1 clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) clips for use with 2-23/32 in. wide furring channels. Adjoining channels are overlapped as described in Item a. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping No. 6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 9.

PAC INTERNATIONAL L L C — Types RSIC-1 or RSIC-1 (2.75)

7. **Gypsum Board*** — One layer of nom 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to trusses. Attached to the resilient channels using 1 in. long Type S bugle-head screws. Screws spaced a max of 12 in. OC along butted end-joints and in the field when no insulation (Item 8 or 8A) is fitted in the concealed space, or a max of 8 in. OC along butted end-joints and in the field when insulation (Item 8 or 8A) is fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane.

UNITED STATES GYPSUM CO — Types C, IP-X2, IPC-AR

7A. **Gypsum Board*** — As an alternative to Item 7 — Nom 5/8 in. thick, 48 in. wide gypsum board, installed and secured as described in Item 7 with max screw spacing 8 in. OC.

CGC INC — Type ULIX

UNITED STATES GYPSUM CO — ULIX

8. **Batts and Blankets** — Optional — Any thickness mineral wool or glass fiber insulation bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over the resilient channel/gypsum board ceiling membrane.

8A. **Loose Fill Material** — Optional — As an alternate to Item 8 - Any thickness of loose fill material bearing the UL Classification Marking for Surface Burning Characteristics, having a flame spread value of 25 or less and a smoke spread value of 50 or less. Insulation fitted in the concealed space, draped over the resilient channel/gypsum board ceiling membrane.

9. **Finishing System** — (Not Shown) — Vinyl, dry or premixed joint compound, applied in two coats to joints and screw-heads; paper tape, 2 in. wide, embedded in first layer of compound over all joints. As an alternate, nom 3/32 in. thick veneer plaster may be applied to the entire surface of gypsum wallboard.

10. **Steel Beam** — **Optional** — (Not Shown) — W8x35 min size, used to support structural steel members (Item 1) at ends.

ALTERNATE CONSTRUCTION: 2 Hr. Rating

1. **Structural Steel Members*** — Pre-fabricated light gauge steel truss system consisting of cold-formed, steel cord and web sections. Trusses fabricated in various sizes, depths, and from various steel thickness. Trusses spaced a max of 24 in. OC.

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6D. **Resilient Channels** — Resilient channels formed of 25 MSG galv. steel, 1/2 in. deep, installed perpendicular to the steel trusses (Item 1), spaced a max of 16 in. OC when no insulation (Item 8 or 8A) is fitted in the concealed space, or a max of 12 in. OC when insulation (Item 8 or 8A) is fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane. Two courses of resilient channel positioned 6 in. OC at wallboard butt-joints (3 in. from each end of wallboard). Channels oriented opposite at wallboard butt-joints. Channel splices overlapped 4 in. beneath steel trusses. Channels secured to each truss with Type S12 by 1/2 in. long screws.

ALTERNATE CONSTRUCTION: 2 Hr. Rating

1. **Structural Steel Members*** — Pre-fabricated light gauge steel truss system consisting of cold-formed, steel cord and web sections. Trusses fabricated in various sizes, depths, and from various steel thickness. Trusses spaced a max of 24 in. OC.

AEGIS METAL FRAMING, DIV OF MITEK — Ultra-Span, Pre-fabricated Light Gauge Steel Truss System

5A. **Structural Cement-Fiber Units*** — (Not Shown)- As an alternate to Items 3, 4 and 5 -Nom 3/4 in. thick, with long edges tongue and grooved. Long dimension of panels to be perpendicular to joists with end joints staggered a min of 2 ft and centered over the joists. Panels secured to steel joists with 1-5/8 in. long No. 8 self-drilling, self-countersinking steel screws spaced a max of 12 in. OC in the field with a screw located 1 in. and 2 in. from each edge, and 8 in. OC on the perimeter with a screw located 2 in. from each edge, located 1/2 in. from the side edges of the panel.

UNITED STATES GYPSUM CO — Types STRUCTO-CRETE or USGSP

5B. **Gypsum Board*** — (Not Shown) — Min 1/4 in. thick, 4 ft by 4 ft gypsum board underlayment, Classified as to Surface Burning Characteristics. Bonded and attached to Structural Cement Fiber Unites (Item 1A) with a mortar applied with a 1/4 in. by 1/4 in. notched trowel, and 1-1/4 in. long coarse thread screws spaced max 8 in. OC. Joints between Structural Cement Fiber Units and of Gypsum Board staggered a min of 6 in.

UNITED STATES GYPSUM CO — Type FRX-G

6D. **Resilient Channels** — Resilient channels formed of 25 MSG galv. steel, 1/2 in. deep, installed perpendicular to the steel trusses (Item 1), spaced a max of 16 in. OC when no insulation (Item 8 or 8A) is fitted in the concealed space, or a max of 12 in. OC when insulation (Item 8 or 8A) is fitted in the concealed space, draped over the resilient channel/gypsum wallboard ceiling membrane. Two courses of resilient channel positioned 6 in. OC at wallboard butt-joints (3 in. from each end of wallboard). Channels oriented opposite at wallboard butt-joints. Channel splices overlapped 4 in. beneath steel trusses. Channels secured to each truss with Type S12 by 1/2 in. long screws.

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Last Updated on 2019-11-12

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