ONLINE CERTIFICATIONS DIRECTORY

Design No. P535
BXUV.P535
Fire-resistance Ratings - ANSI/UL 263

Page Bottom

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

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. P535

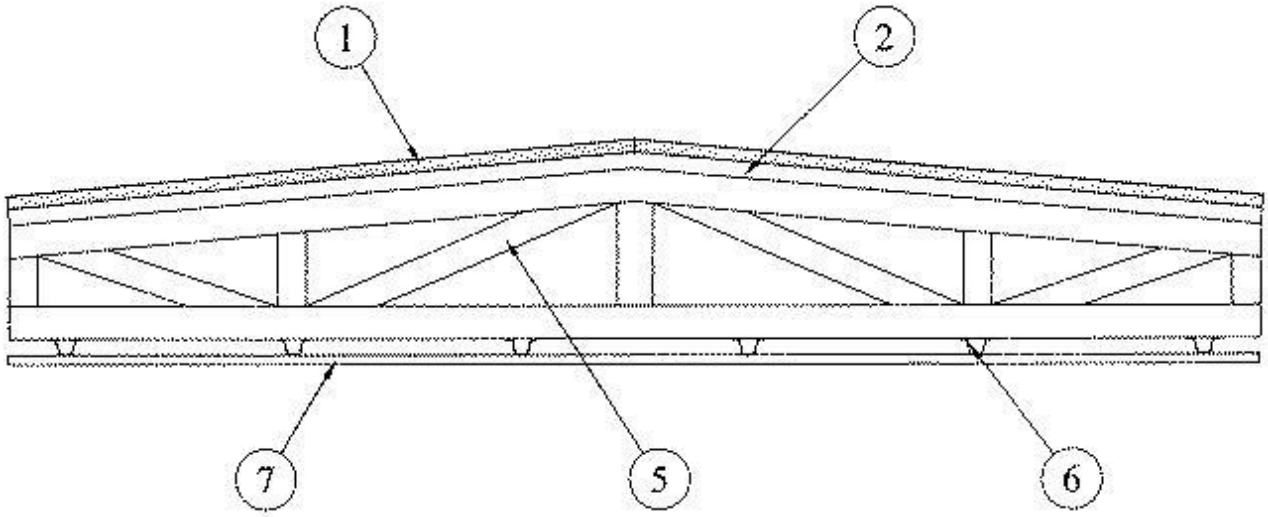
August 27, 2015

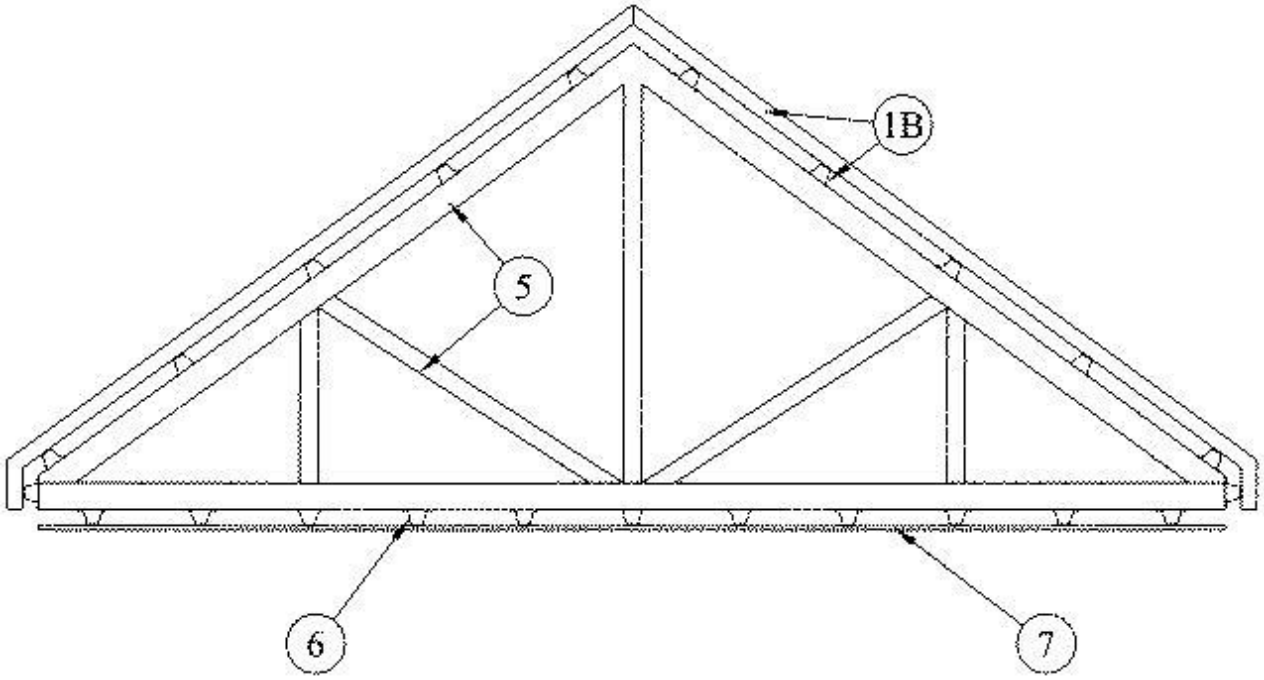
Restrained Assembly Rating - 1 Hr

Unrestrained Assembly Rating - 1 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. **Roof Covering* —** Consisting of hot-mopped or cold-application materials compatible with insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory - Roofing Systems (TGFU).

1A. **Roofing Membranes* —** In lieu of Item 1, single-ply membrane that is either ballasted, adhered or mechanically attached to the insulation(s) described herein as permitted under the respective company's Classification. See Fire Resistance Directory - Roofing Membranes (CHCI) Category.

1B. **Metal Roof Deck Panels* —** In lieu of or in addition to Items 1 and 1A, the roof covering may consist of mechanically fastened 24 MSG galv or painted steel roof deck panels. Panels may be installed above a steel purlin assembly per metal roof deck manufacturer's specifications. Steel purlin assembly to be installed transverse to steel roof trusses (Item 5). A line of sealant or tape may be used at panel side and end laps. See Metal Roof Deck Panels Category in the Roofing Materials and Systems Directory (TJPV) or Fire Resistance Directory (CETW) for names of manufacturers.

1C. **Roof Covering* —** In lieu of Items 1, 1A, and 1B - Any UL Class A, B or C Prepared Roof Covering (TFWZ) acceptable for use over plywood sheathing or non-veneer APA Rated Series Sheathing. Sheathing mechanically fastened through roof insulation to top chord of steel trusses with fasteners spaced a max of 12 in. OC. As an alternate to the plywood sheathing or non-veneer APA Rated Series Sheathing, the Prepared Roof Covering (TFWZ) may be applied directly to the Building Units* (Item 4C) if the building units also carry the UL Classification Marking for Prepared Roofing Accessories (TGDY). Fasteners to be of sufficient length to penetrate top chord of truss by 3/8 in.

2. **Mineral and Fiber Board* —** One layer of min. 1-7/8 in. thick by 24 in. wide boards, installed with long dimension perpendicular to steel roof trusses (Item 5). Mechanically fastened to truss top chords at 6 in. OC max with pneumatically driven 2-1/2 in. long and 0.1 in. diameter steel coil pins. Maximum allowable live load applied to boards shall be 50 lb/sq ft. As an alternate, when Item 3 or 3A is used, the min. thickness may be reduced to 1 in. if truss (Item 5) is spaced 24 in. OC, or 1-3/8 in. if truss (Item 5) is spaced 36 OC.

HOMASOTE CO — Type FireStall

3. **Cementitious Backer Units* —** (Not Shown) — Optional only when using 1-7/8 in. thick Mineral and Fiber Board (Item 2) and no Roof Insulation (Items 4, 4A, 4B, or 4C). Supplied in nom 32 in. wide by min 48 in. long by nom 1/2 or 5/8 in. thick sheets. Applied perpendicular to mineral and fiber board (Item 2). Units loosely laid, adhered or mechanically attached to mineral and fiber boards. Backer Units to be offset in both directions from Mineral and Fiber Board layer below in order to lap all joints.

UNITED STATES GYPSUM CO — Type DCB.

3A. **Gypsum Board —** (Not Shown — Classified or Unclassified) — As an alternate Item 3, gypsum sheathing, supplied in sheets 4 ft wide by 8 to 12 ft long by min 1/2 in. thick, applied perpendicular to mineral and fiber board (Item 2). Sheathing loosely laid, adhered or mechanically attached to mineral and fiber board. Sheathing to be offset in both directions from Mineral and Fiber Board layer below in order to lap all joints. See Gypsum Board (CKNX) category for names of Classified companies.

4. **Roof Insulation - Foamed Plastic* —** (Not Shown, Optional) — Any polyisocyanurate foamed plastic insulation boards bearing the UL Classification Marking. No minimum or maximum thickness. Roof insulation loosely laid, adhered or mechanically fastened to cementitious backer units (Item 3), or gypsum sheathing (Item 3A). When applied in more than one layer, each layer of board to be offset in both directions from layer below in order to lap all joints. See Foamed Plastic (CCVW) Category in the Fire Resistance Directory.

4A. **Roof Insulation - Foamed Plastic* —** (Not Shown, Optional) — As an alternate to Item 4 — Any polystyrene foamed plastic insulation boards bearing the UL Classification Marking. No min or max thickness. Roof insulation loosely laid, adhered or mechanically fastened to cementitious backer units (Item 3), or gypsum sheathing (Item 3A). When applied in more than one layer, each layer of board to be offset in both directions from layer below in order to lap all joints. See Foamed Plastic (BRYX) category in the Building Materials Directory or Foamed Plastic (CCVW) category in the Fire Resistance Directory.

4B. **Roof Insulation - Mineral and Fiber Boards* —** (Not Shown, Optional) — As an alternate to Item 4 - Mineral wool, glass fiber or perlite insulation boards, 24 by 48 in. min size, 48 by 96 max size, applied in one or more layers. No min or max thickness. Boards installed over the cementitious backer units (Item 3) or gypsum sheathing (Item 3A), with end-joints staggered in adjacent rows. When applied in more than one layer, each layer of board to be offset in both directions from layer below in order to lap all joints. See Mineral and Fiber Boards (BQXR) Category in the Building Materials Directory.

4C. **Roof Insulation - Building Units* —** (Not shown, Optional) — As an alternate to Item 4 — Any polyisocyanurate foamed plastic insulation faced on the top surface with oriented strand board or faced on the underside or both sides with wood fiber board, bearing the UL Classification Marking for Fire Resistance. No min or max thickness. Boards loosely laid, adhered or mechanically fastened to cementitious backer units (Item 3) or gypsum sheathing (Item 3A), with the end-joints staggered in adjacent rows. When applied in more than one layer, each layer of board to be offset in both directions from layer below in order to lap all joints. See Building Units (BZXX) category in the Fire Resistance Directory.

5. **Steel Roof Trusses —** Cold-formed galvanized steel truss chord and web sections manufactured from steel conforming to ASTM A653 Grade 33 or higher yield strength. Steel thickness of truss chord and web sections as required by design to meet governing code requirements. Truss members connected together with No. 10-16 (min size) self-drilling screws or equivalent. Truss chord and web members to be designed in accordance with the American Iron and Steel Institute's Specification for the Design of Cold-Formed Steel Structural Members, 1996 Edition. Trusses spaced a max of 24, 36 or 48 in. OC, refer to Item 2. Where the truss intersects with the interior face of the exterior walls, the min truss depth shall be 11-7/8 in. or 5 in. with a min roof slope of 3/12 and a min area in the plane of the truss of 20 sq/ft.

6. **Furring Channels —** Resilient channels formed of 25 MSG thick galv steel, spaced 24 in. OC, perpendicular to steel trusses when steel trusses are spaced a max. 24 in. OC. Resilient channels spaced a max of 12 in. OC when Batts and Blankets (Item 11) are used. 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 or with No. 18 SWG galv steel wire double strand saddle ties. Channels tied together with double strand of No. 18 SWG galv steel wire at each end of overlap.

6A. **Furring Channels —** (Not Shown) — As an alternate to Item 6 — Hat channels min 20 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 16 in. OC. Two courses of channel positioned 6 in. OC, 3 in. from each end of wallboard. Channel splices overlapped 6 in. beneath steel trusses. Channels secured to each truss with No. 18 SWG steel wire double strand saddle ties. Channels tied together with double strand of No. 18 SWG steel wire at each end overlap.

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 spaced 12 in. OC along butted end-joints and in the field. End-joints fastened to additional pieces of furring channel to extend a min of 3 in. beyond ends of butted end-joints. When Batts and Blankets (Item 11) are used screws spaced a max 8 in. OC

CGC INC — Type C, IP-X2.

UNITED STATES GYPSUM CO — Type C, IP-X2.

USG BORAL ZAWAWI DRYWALL L L C SFZ — Type C

USG MEXICO S A DE C V — Type C, IP-X2.

8. **Finishing System —** (Not Shown) - Vinyl, dry of 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.

9. **Batts and Blankets* —** Optional - Not Shown - When used Ratings are limited to 1 Hr. - 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 steel framing members/gypsum wallboard ceiling membrane.**Alternate Ceiling Membrane —** Not Shown.

10. **Steel Framing Members* —** Main runners, cross tees, cross channels and wall angle as listed below:

a. **Main Runners —** Nom 10 or 12 ft. long, 15/16 in. or 1-1/2 in. wide face, spaced 4 ft. OC.

b. **Cross Tees —** Nom 4 ft. long, 1-1/2 in. wide face, 15/16 in. wide face installed at sides of light fixtures, installed perpendicular to the main runners, spaced 24 in. OC. When Batts and Blankets* (Item 9) are used, cross tees spaced 16 in. OC. Additional cross tees or cross channels used at 8 in. from each side of butted wallboard end joints. The cross tees or cross channels may be riveted or screw attached to the wall angle or channel to facilitate the ceiling installation.

c. **Cross Channels —** Nom 4 ft. long, installed perpendicular to main runners, spaced 24 in. OC. When Batts and Blankets* (Item 9) are used, cross channels spaced 16 in. OC.

d. **Wall Angle or Channel —** Painted or galv steel angle with 1 in. legs or channel with 1 in. legs, 1-9/16 in. deep attached to walls at perimeter of ceiling with fasteners 16 in. OC. To support steel framing member ends and for screw-attachment of the gypsum wallboard.

CGC INC — Type DGL or RX.

USG INTERIORS LLC — Type DGL or RX.

11. **Gypsum Board* —** For use with **Steel Framing Members*** (Item 10) when **Batts and Blankets*** (Item 9) are not used - One layer of nominal 5/8 in. thick by 48 in. wide boards, installed with long dimension parallel to the main runners. Wallboard fastened to each cross tee or channel with five wallboard screws, with one screw located at the midspan of the cross tee or channel, one screw located 12 in. from and on each side of the cross tee or channel mid span and one screw located 1-1/2 in. from each wallboard side joint. Except at wallboard end joints, wallboard screws shall be located 1/2 in. from the joint. Wallboard fastened to main runners with wallboard screws 1/2 in. from side joints, midway between intersections with cross tees or channels (16 in. OC). End joints of adjacent wallboard sheets shall be staggered not less than 32 in. Wallboard sheets screw attached to leg of wall angle with wallboard screws spaced 12 in. OC. Joints treated as described in Item 7. For use with **Steel Framing Members*** (Item 10) when **Batts and Blankets*** (Item 9) are used - - Ratings limited to 1 Hour- 5/8 in. thick, 4 ft wide; installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Fastened to cross tees with 1 in. long steel wallboard screws spaced 8 in. OC in the field and 8 in. OC along end joints. Fastened to main runners with 1 in. long wallboard screws spaced midway between cross tees. Screws along sides and ends of boards spaced 3/8 to 1/2 in. from board edge. End joints of the sheets shall be staggered with spacing between joints on adjacent boards not less than 4 ft OC.

CGC INC — Type C, IP-X2.

UNITED STATES GYPSUM CO — Type C, IP-X2.

USG BORAL ZAWAWI DRYWALL L L C SFZ — Type C

USG MEXICO S A DE C V — Type C, IP-X2.

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Last Updated on 2015-08-27