UL Product iQ™

BXUV.G559 -

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

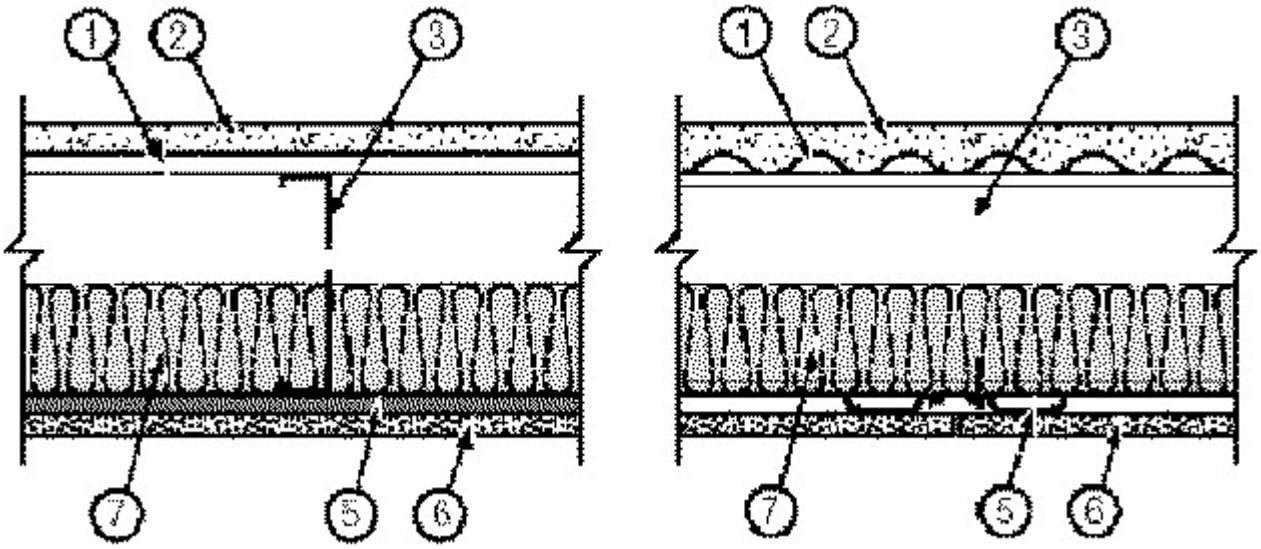
Design No. G559

October 23, 2018

Unrestrained Assembly 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. **Steel Deck —** Min 9/16 in. deep, 22 MSG galv corrugated fluted steel deck. Attached to each joist with #10 3/4 in. long screws at each side joint and no more than 12 in. OC between sides.

2. **Floor Topping Mixture* —** Compressive strength to be 2500 psi min. Minimum thickness to be 1 in. as measured from the top plane of the deck or the top plane of the **Floor Mat Material***. When 6 in. or 8 in. deep steel joists are used, floor topping mixture is to be a minimum of 1-1/8 in. thick. Refer to manufacturer's instructions accompanying the material for specific mix design. An ethylene vinyl acetate adhesive may be applied to the steel deck prior to the installation of the floor topping mixture at a maximum application rate of 0.025 lbs./ft^2.
UNITED STATES GYPSUM CO — CSD, LRK, HSLRK

Floor Mat Materials* — (Optional) — Not shown — Floor mat material loose laid over the subfloor. Refer to manufacturer's instructions regarding the minimum thickness of floor topping over each floor mat material.
UNITED STATES GYPSUM CO — Types SAM, LEVELROCK® Brand Sound Reduction Board, LEVELROCK® Brand Floor Underlayment SRM-25

Floor Mat Materials* — (Optional) — Not shown — Floor mat material loose laid over the crests of the steel deck. Flutes of the deck are not required to be filled prior to installation of sound mat. Min 1-3/8 in thick floor topping mixture applied over the floor mat.
UNITED STATES GYPSUM CO — Type SAM CSD

2A. **Floor Topping Mixture* —** (As an alternate to Item 2, not shown) — Various types of insulating concrete prepared and applied in the thickness indicated below:

A. **Vermiculite Concrete —** 6 cu ft of Vermiculite Aggregate* to 94 lbs. of Portland cement and 0.5 lb. of air entraining agent. Min 2-1/2 in. thickness above top plane of steel deck when no foamed plastic insulation boards (Item 9) are used. When foamed plastic insulation boards are used, min thickness above foamed plastic is 2 in. and min thickness between the top plane of the steel deck and the foamed plastic is 1/8 in. The max vermiculite concrete thickness shall be determined by job site conditions.
SIPLAST INC

THE STRONG CO INC

VERMICULITE PRODUCTS INC

B. **Cellular Concrete — Roof Topping Mixture* —** Foam concentrate mixed with water and Portland cement per manufacturer's specifications. Cast dry density and 28-day compressive strength of min 190 psi as determined in accordance with ASTM C495-66. Thickness of cellular concrete topping to be 2-3/4 in. min above top plane of steel

deck when no foamed plastic insulation boards (Item 9A) are used. When foamed plastic is used, a 1/8 in. min slurry coat of cellular concrete, as measured to the top of the steel form unit corrugations, shall be employed. The cellular concrete topping thickness above foamed plastic, shall be 2 in. min.
CELCORE INC — Type Celcore with cast dry density of 31 (+ or - 3.0) pcf or Type Celcore MF with cast dry density of 29 (+ or - 3.0) pcf.

AERIX INDUSTRIES — Cast dry density 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 —** Mix consists of 6 cu ft of Perlite Aggregate* to 94 lb of Portland cement and 1-1/2 pints of air entraining agent. Min 2-1/2 in. thickness above top plane of steel deck when no foamed plastic insulation boards (Item 9B) are used. When foamed plastic boards are used, min thickness above foamed plastic is 2 in. and min thickness between the top plane of the steel deck and the foamed plastic is 1/8 in.
See **Perlite Aggregate** (CFFX) category in Fire Resistance Directory for names of Classified companies.

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. A 1/8 in. min slurry coat shall be employed below the foamed plastic (Item 9A or 9B). The cellular concrete topping thickness, above the foamed plastic, shall be 2 in. min.
AERIX INDUSTRIES — Mix #3.

SIPLAST INC — Mix #3.

2B. **Lightweight Concrete —** (As an alternate to Items 2 and 2A, not shown) -- Lightweight concrete, expanded shale or slate aggregate by rotary-kiln method or expanded clay aggregate by rotary-kiln or sintered-grate method, 107 - 113 pcf unit weight, 3000 psi compressive strength, vibrated, 4 to 7 per cent entrained air. Min. thickness as measured from the top plane of the steel deck, 2-1/2 in.

3. **Structural Steel Members* —** The proprietary joists are channel-shaped, 9-1/4 in. min depth. Joists are fabricated from min No. 16 MSG galv steel. Joists spaced max 24 in. OC. Joists attached to rim joist with a minimum of three #10 3/4 in. long self-drilling screws at the rim track clip to the outside of the web joist, and a #10 1/2 in. long screw through the top and bottom flange of the joists to the top and bottom flange of the rim track. At rim joist splices bearing on supports, rim joists are connected using an overlapping section of a 12 in. long splice plate (a joist piece), with a minimum of six 3/4 in. long self-drilling #10 screws to each rim piece.
CALIFORNIA EXPANDED METAL PRODUCTS CO — Type SSCJ floor joists, SSRT rim joists or Type SSTT rim joists. When Type SSTT rim joists are used, secured to preformed clip tabs in accordance with manufacturers installation instructions.

4. **Joist Bridging —** Not shown — Installed immediately after joists are erected and before construction loads are applied. The structural bridging, Type CEMCO Sure Bridging, consisting of No. 18 MSG galv steel, 2-1/2 in. wide by 25-1/2 in. long with 1-5/16 in. long legs structural bridging staggered between the steel joists and attached to the bottom joist flange with two #10 1/2 in. long self-drilling screws at each end tab of bridging. Solid bridging consisting of cut to length joist sections placed between outer joists and at center joist with 8 ft OC max spacing. Solid bridging is seated in the structural bridging and is screw-attached at joist web using Type CEMCO Sure-Support Clips (1-1/2 in. by 1-1/2 in. by 7 in. long, 16 MSG, min 50 ksi support clip) with three #10 3/4 in. long self-drilling screws per leg on one side and the other side with Type CEMCO Sure-Support Clips (4 in. by 1-1/2 in. by 7 in. long, 16 MSG, min 50 ksi support clip) with three #10 3/4 in. long self-drilling screws per leg.

5. **Resilient Channels —** 1/2 in. deep, formed of 25 MSG galv steel, spaced 12 in. OC perpendicular to joists. Channel splices overlapped 4 in. beneath steel joists. Channels secured to each joist with 1/2 in. Type S-12 low profile screws. Channels oriented opposite at wallboard butt joints (spaced 5-1/2 in. OC) as shown in the above illustration.

5A. **Alternate Steel Framing Members —** (Not Shown) - As an alternate to Item 5, 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. Main runners suspended by min 12 SWG galv steel hanger wires spaced 48 in. OC. Hanger wires to be located adjacent to main runner/cross tee intersections. Hanger wires inserted through holes drilled through web of joists and twist-tied.

b. **Cross Tees —** Nom 4 ft long, 1-1/2 in. wide face, installed perpendicular to the main runners, spaced 16 in. OC. Additional cross tees or cross channels used at 8 in. from each side of butted gypsum panel 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 or 12 ft long, installed perpendicular to main runners, 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 panel.

CGC INC — Type DGL or RX.

USG INTERIORS LLC — Type DGL or RX.

6. **Gypsum Board* —** Nom 5/8 in. thick, 48 in. wide gypsum panels. When resilient channels (Item 5) are used, gypsum panels installed with long dimension perpendicular to resilient channels. Gypsum panels secured with 1 in. long Type S bugle-head screws spaced 8 in. OC in both the field and the perimeter, and 1-1/2 in. from side edges of the board. When Steel Framing Members (Item 5A) are used, gypsum panels installed with long dimension perpendicular to cross tees with side joints centered along main runners and end joints centered along cross tees. Panels fastened to cross tees with 1 in. long Type S bugle-head screws spaced 8 in. OC in the field and along end joints. Panels fastened to main runners with 1 in. long Type S bugle-head screws spaced midway between cross tees. Screws along sides and ends of panels spaced 3/8 to 1/2 in. from panel edge. End joints of panels shall be staggered with spacing between joints on adjacent panels not less than 2 ft OC.

CGC INC — Types C, IP-X2, IPC-AR

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

USG MEXICO S A DE C V — Types C, IP-X2, IPC-AR

7. **Batts and Blankets* —** Glass fiber insulation, min 3-1/2 in. thick, bearing the UL Classification Marking for Surface Burning Characteristics and/or Fire Resistance. Insulation fitted in the concealed space, draped over the resilient channel/gypsum panel ceiling membrane. See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

8. **Joint 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.

9. **Foamed Plastic* —** Optional — For vermiculite concrete applications — Foamed plastic insulation boards with holes and/or slots. Nom 24 by 48 in. size. Thickness 1 in. to max 8 in.

VERMICULITE PRODUCTS INC

9A. **Foamed Plastic* —** Nom 24 by 48 in., 48 by 48 in. or 24 by 96 in. or 48 by 96 in. by max 8 in. thick polystyrene foamed plastic insulation boards with holes symmetrically placed having a max density of 2.0 pcf. For use only with cellular concrete roof topping mixture.

STARRFOAM MFG INC

9B. **Foamed Plastic* —** Nominal 24 by 48 by max 8 in. thick polystyrene foamed plastic insulation boards having a density of 1.0 + 0.1 pcf encapsulated within cellular or perlite concrete topping (Item 3B or 3C). Each insulation board shall contain six nom 3 in. diameter holes oriented in two rows of three holes each with the 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.

* 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 2018-10-23