

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.
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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. **U349**

November 28, 2024

Bearing Wall Rating - 2 Hr Rating Exposed to Fire on Interior Face Only (See Item 6)

Bearing Wall Rating - 1 Hr Rating Exposed to Fire on Exterior Face (See Item 7)

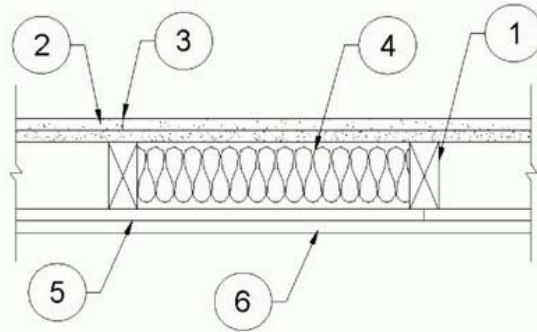
Bearing Wall Rating - 2 Hr Rating Exposed to Fire on Exterior Face (See Item 5C or 8)

For Wood Studs, Finish Rating — 55 min (Exposed to Fire on Interior Face)

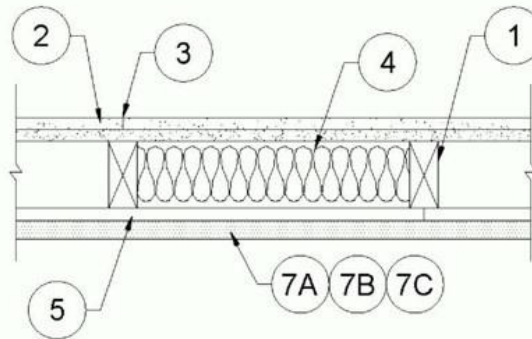
This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide [BXUV](#) or [BXUV7](#)

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

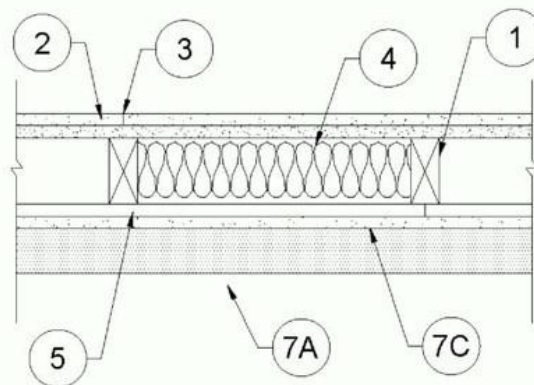
2-HOUR
(FIRE FROM INTERIOR ONLY)



2-HOUR INTERIOR
1-HOUR EXTERIOR



2-HOUR
(FIRE FROM EITHER FACE)



1. **Wood Studs** — Nom 2 by 4 in., spaced 16 in. OC in with two 2 by 4 top and one 2 by 4 bottom plates. As an option, nom 2 by 6 in., spaced 24 in. OC with two 2 by 6 top and one 2 by 6 bottom plates may be used in lieu of 2 by 4 studs and plates. Studs effectively fire stopped.

1A. **Steel Studs** — (Not Shown) — In lieu of Item 1. Corrosion protected steel studs, min No. 20 MSG and min. 3-1/2 in. deep, cold formed, shall be designed in accordance with the current edition of the Specification for the Design of Cold-Formed Steel Structural Members by the American Iron and Steel Institute. All design details enhancing the structural integrity of the wall assembly, including the axial design load of the studs, shall be as specified by the steel stud designer and/or producer, and shall meet the requirements of all applicable local code agencies. The max stud spacing of wall assemblies shall not exceed 16 in. OC. Studs attached to floor and ceiling tracks with 1/2 in. long Type S-12 steel screws on both sides of studs or by welded or bolted connections designed in accordance with the AISI specifications.

1B. **Steel Floor and Ceiling Tracks** — (Not Shown, for use with Item 1A) — Top and bottom tracks of wall assemblies shall consist of steel members, min No. 20 MSG and min. 3-1/2 in. deep. Attached to floor and ceiling assemblies with steel fasteners spaced not greater than 24 in. O.C.

1C. **Lateral Support Members** — (Not Shown, for use with Item 1A) — Where required for lateral support of steel studs, support may be provided by means of steel straps, channels or other similar means as specified in the design of a particular steel stud wall system.

2. **Gypsum Board*** — **Any 5/8 in. thick UL Classified Gypsum Board that is eligible for use in Design Nos. L501, G512 or U305.** Nom 5/8 in. thick, 4 ft. wide, two layers applied vertically or horizontally if all joints (side and butt end joints) of applied gypsum board are backed by the same type studs as specified in Item 1. Base layer nailed to wood studs and bearing plates 6 in. OC. with 6d cement coated nails, 1-7/8 in. long, 0.0915 in. shank diam. and 1/4 in. diam. head. The face layer, with joints staggered from base layer, nailed to the studs and bearing plates over the base layer, 8 in. OC. with 8d cement coated nails, 2-3/8 in. long, 0.113 in. shank diam. 9/32 in. diam. head. For securement to steel studs and track, 1 in. long Type S or S-12 steel screws to be used to install the base layer and 1-5/8 in. long Type S or S-12 steel screws to be used to install the face layer. Spacings of screws that same as described for nails.
CABOT MANUFACTURING ULC ([View Classification](#)) — CKNX.R25370

AMERICAN GYPSUM CO ([View Classification](#)) — CKNX.R14196

BEIJING NEW BUILDING MATERIALS PUBLIC LTD CO ([View Classification](#)) — CKNX.R19374

CERTAINTED GYPSUM INC ([View Classification](#)) — CKNX.R3660

CERTAINTED GYPSUM INC ([View Classification](#)) — CKNX.R18482

CGC INC ([View Classification](#)) — CKNX.R19751

GEORGIA-PACIFIC GYPSUM L L C ([View Classification](#)) — CKNX.R2717

GEORGIA-PACIFIC GYPSUM L L C ([View Classification](#)) — CKNX.R6937

NATIONAL GYPSUM CO ([View Classification](#)) — CKNX.R3501

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM ([View Classification](#)) — CKNX.R7094

PANEL REY S A ([View Classification](#)) — CKNX.R21796

SIAM GYPSUM INDUSTRY (SARABURI) CO LTD ([View Classification](#)) — CKNX.R19262

THAI GYPSUM PRODUCTS PCL ([View Classification](#)) — CKNX.R27517

UNITED STATES GYPSUM CO ([View Classification](#)) — CKNX.R1319

3. **Joints and Nailheads** — Gypsum board joints covered with tape and joint compound. Nail heads covered with joint compound.

4. **Batts and Blankets*** — Faced or unfaced mineral fiber insulation, 3-1/2 in. thick, nom 3.0 pcf, pressure fit in the wall cavity between stud, plates, and cross bracing. If 2 by 6 in. studs (Item 1) are used, min. 5-1/2 in. of unfaced mineral fiber insulation, nom 3.0 pcf, pressure fit in the wall cavity between stud, plates, and cross bracing. Insulation may be applied in multiple layers to achieve final thickness.

See **Batts and Blankets*** (BZJZ) category for names of Classified manufacturers.

4A. **Glass Fiber Insulation** — (As an alternate to Item 4 when wood studs are used to frame the wall) — Faced or unfaced glass fiber batts 3-1/2 in. thick, nom 0.25 pcf, pressure fit in the wall cavity between stud, plates, and cross bracing may be used. If 2 by 6 in. studs (Item 1) are used, min. 5-1/2 in. of unfaced glass fiber batts, nom 0.25 pcf, pressure fit in the wall cavity between stud, plates, and cross bracing. Insulation may be applied in multiple layers to achieve final thickness. When Item 5C is used, the minimum density shall be 0.61 pcf.

See **Batts and Blankets*** (BZJZ) category for names of Classified manufacturers.

4B. **Loose Fill Materials** — Blown-in fiberglass loose-fill insulation material as an alternate to Item 4A. The insulation is blown into the wall cavity to a minimum thickness of 3-1/2 in. with a minimum density of 0.25 pcf. If 2 by 6 in. studs (Item 1) are used the minimum thickness is increased to 5-1/2 in. When Item 5C is used, the minimum density shall be 0.61 pcf.

4C. **Fiber, Sprayed*** — (As an alternate to Item 4 when wood studs are used to frame the wall) — (100% Borate Formulation) — Spray applied cellulose material. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product with a nominal dry density of 2.7 lb/ft³. Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 3.5 lb/ft³, in accordance with the application instructions supplied with the product.

Applegate Greenfiber Acquisition LLC — Insulmax and SANCTUARY for use with wet or dry application.

4D. **Fiber, Sprayed*** — (As an alternate to Item 4 when wood studs are used to frame the wall) - Spray applied cellulose fiber. The fiber is applied with water to completely fill the enclosed cavity in accordance with the application instructions supplied with the product. The minimum dry density shall be 4.30 lbs/ft³.

INTERNATIONAL CELLULOSE CORP — Celbar-RL

4E. **Fiber, Sprayed*** — (As an alternate to Item 4 when wood studs are used to frame the wall) - Spray applied cellulose insulation material. The fiber is applied with water to interior surfaces in accordance with the application instructions supplied with the product. Applied to completely fill the enclosed cavity. Minimum dry density of 4.3 pounds per cubic ft.

NU-WOOL CO INC — Cellulose Insulation

5. **Building Units*** — Building units nailed to the wood framing with 1-7/8 in. long, 6d nails, spaced 6 in. OC. on the perimeter and 12 in. OC. in the field. When steel studs are used min. 1-7/8 in. long steel screws installed 6 in. OC on the perimeter and 12 in. OC in the field.

LOUISIANA-PACIFIC CORP — Type Blazeguard 2-Side

LOUISIANA-PACIFIC CORP — Type LP FlameBlock 2-Side

5A. **Foamed Plastic*** — (Optional — for use with Item 5) — Foamed plastic boards, faced or unfaced, may or may not be bonded to fiberboard, plywood or OSB, and placed between building units (Item 5) and exterior facings (Items 6, 7 or 8).

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — Types "TSX-8500", "ECOMAXci FR", "TSX-8510", "ECOMAX xi FR White", "ECOMAXci", "ECOMAXci FR Air Barrier", "Thermasheath-XP", "Thermasheath", "Durasheath"

ATLAS ROOFING CORP — "EnergyShield®", "EnergyShield® CGF", "EnergyShield® XR", "EnergyShield® Pro Wall Insulation", "EnergyShield® CGF Pro", "EnergyShield® Ply Pro"

5B. **Building Unit*** — (Optional — for use with Item 5) — Polyisocyanurate composite foamed plastic insulation boards to be placed between building units (Item 5) and exterior facings (Item 6). Attached to studs with 8d nails or 2-1/2 in. long Type W screws.

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — Types "Thermasheath-SI", "ECOBASEci", "ECOMAXci FR Ply", "ThermaBase-CI" and "ECOMAXci Ply" polyisocyanurate composite foamed plastic insulation boards

ATLAS ROOFING CORP — "EnergyShield® Ply"

5C. **Batts and Blankets *** — (Optional - Not Shown— for use with Items 5 and wood studs (Item 1), spaced 16 in. OC. Studs loaded as braced by sheathing, calculated by the ASD method provided in the 2018 Edition of the National Design Specification for Wood Construction. 85 minute finish rating.) — Required for 2 Hour Rating from the Exterior Face. 24 in by 48 in. unfaced mineral fiber insulation, min. 2 in. thick, min. 6.4 pcf, installed in a stacked bond pattern, butt end vertical joints centered between the studs (Item 1), and screwed to the studs through building units (Item 5), with 3-1/2 inch long, 0.15 inch thick exterior wood screws and 1-1/4 inch diameter 0.03 thick galvanized washers. Screws installed at 3 inches from both the top and bottom long edge and at the center, for a total of 5 screws, for a 24 inch by 48 inch piece, on 3 studs spaced 16 in. OC. When smaller pieces of insulation are used, the number of studs dictate the fasteners required. When spanning 2 studs, a minimum of 4 screws shall be used. When installed over a single stud, a minimum of two screws shall be used. Boards to be placed between building units (Item 5) and exterior facings (Item 6).

THERMAFIBER/OWENS CORNING — Type Thermafiber Rainbarrier HD

6. **Exterior Facings** — (Optional except when using items 5A or 5B) – Any exterior facing approved by the Authority Having Jurisdiction installed in accordance with the manufacturer's installation instructions.

7. **Exterior Facings** — (Not Shown) — (Optional except when using items 5A or 5B) – Required for 1 Hour Rating on the Exterior Face. One or more of the following exterior facings shall be installed in accordance with the manufacturer's installation instructions:

7A. **Brick** — Brick veneer, minimum thickness of 2.3 inches, meeting the requirements of local code agencies. Brick veneer attached to the studs with corrugated metal wall ties attached to each stud with 8d cement coated nails, every sixth course of bricks and max 32 in. OC horizontally. One in. air space provided between brick veneer and sheathing. For steel studs, Type S steel screws are used in lieu of nails with a minimum penetration length through the steel stud of 3/8 in.

7B. **Cementitious Stucco** — Portland cement with self-furring metal lath. Minimum thickness of 3/4 in. with a mix ratio of 1:4 for scratch coat and 1:5 for brown coat, by volume, cement to sand.

7C. **Gypsum Board*** — Nom. 5/8 in. thick, 4 ft. wide exterior sheathing applied vertically. Single layer nailed to wood studs and bearing plates 6 in. OC with 1-7/8 in. long 6d cement coated nails. Vertical joints centered over studs and staggered min. 1 stud cavity from the vertical joints of the building units (Item #5). The joints and nail heads do not need to be treated with joint compound.

GEORGIA-PACIFIC GYPSUM L L C — Types DGG

8. **Exterior Facings** — (Not Shown) — Required for 2 Hour Rating on the Exterior Face. The following exterior facing shall be installed in accordance with the manufacturer's installation instructions:

8A. **Brick** — (Not Shown) — Brick veneer, minimum thickness of 3.4 inches, meeting the requirements of local code agencies. Brick veneer attached to the studs with corrugated metal wall ties attached to each stud with 8d cement coated nails, every sixth course of bricks and max 32 in. OC horizontally. One in. air space provided between brick veneer and sheathing. For steel studs, Type S steel screws are used in lieu of nails with a minimum penetration length through the steel stud of 3/8 in.

8B. Combined Item 7C. and Item 7A. installed as previously described as the exposed exterior face.

9. **Steel Framing Members*** — (Optional, Not Shown) — (For use with single layer of gypsum board Item), 1 hour rating only) - Resilient Channels — For use on the Gypsum Board (Item 2) side only. Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced 16 in. OC perpendicular to studs. Channels attached to each Stud (Item 1 or 1A) with 1-1/4 in. Type W or Type S screws. Ends of adjoining channels are overlapped 6 in. and tied together with double strand of No. 18 SWG galv steel wire near each end of overlap. As an alternate, ends of adjoining channels may be overlapped 6 in. and secured together with two self-tapping #6 framing screws, min. 7/16 in. long at the midpoint of the overlap, with one screw on each flange of the channel. Gypsum board attached to furring channels as described in Item 2. All butt end joints to end over vertical studs.

*** 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 2024-11-28

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