

# FIRE-RESISTANCE DESIGN

## Assembly Usage Disclaimer

**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

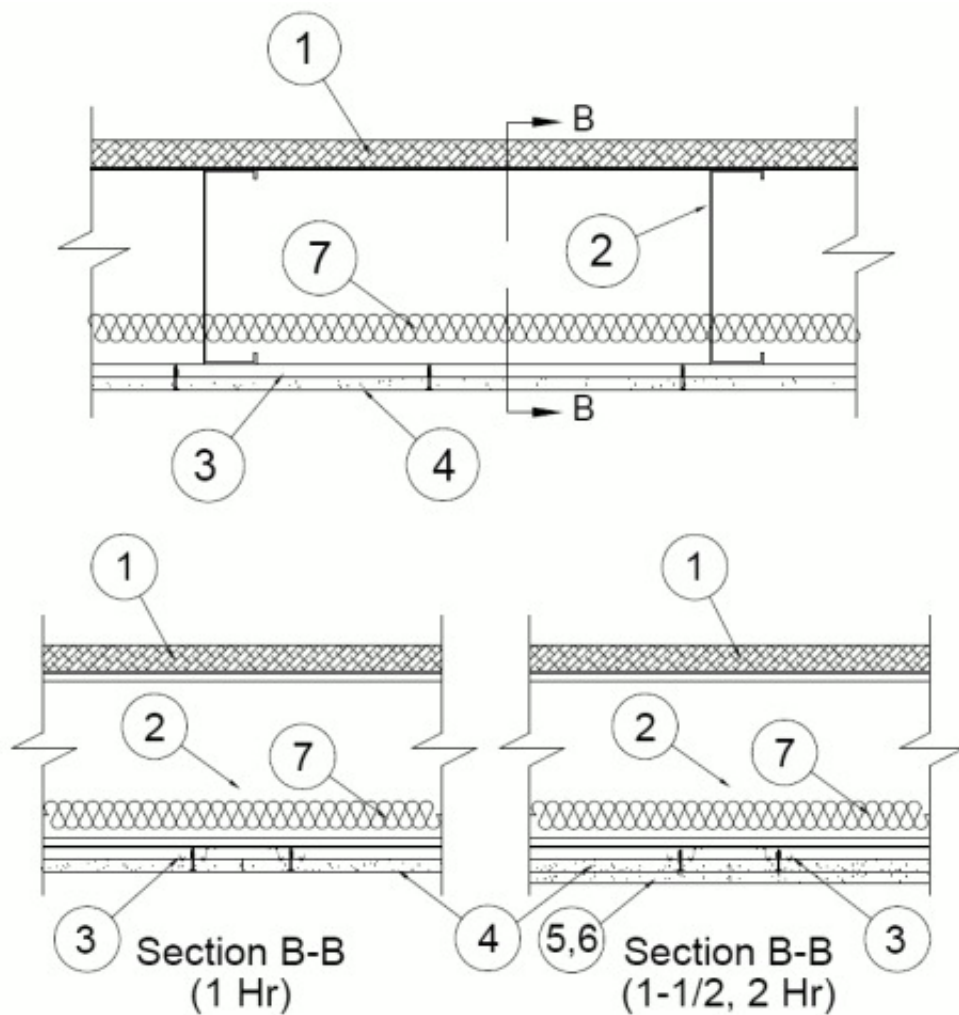
**Design No. H503**

October 16, 2019

**Unrestrained Assembly Rating — 1, 1-1/2, 2, or 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. Units, Partition Panel\*** — For 1 - 2 Hr Rating - Steel faced panels. Panels secured to top chord of steel joists with #8, 1-5/8 in. cement board Grabber screws spaced 6 in. OC.

**CALIFORNIA EXPANDED METAL PRODUCTS CO** — Sure-Board® Series 200S

**MARINO/WARE, DIV OF WARE INDUSTRIES INC** — Sure-Board® Series 200S

**1A. Units, Partition Panel\*** — As an alternate to Item 1 - For 1 - 3 Hr Rating - Steel faced panels. Panels secured to top chord of steel joists with #8, 1-5/8 in. cement board Grabber screws spaced 6 in. OC.

**CALIFORNIA EXPANDED METAL PRODUCTS CO** — Sure-Board® Series 200SG

**MARINO/WARE, DIV OF WARE INDUSTRIES INC** — Sure-Board® Series 200SG

**2. Steel Joists** — 1-2 Hr Rating - C-shaped, galvanized steel sections, 10 in. min depth with 2 in. min. flanges and 5/8 in. min. stiffening flanges. The web of each joist may be provided with maximum 1-1/2 in. high by 3-1/2 in. long knockouts at the joist mid-depth. Knockouts spaced 24 in. OC minimum. The minimum coated steel thickness shall be 0.055 in. Joists spaced max 24 in. OC. At joist rim splices bearing on supports, joists rims are connected using an overlapping section of a 20 in. long splice plate (a joist piece), with four 3/4 in. long self-drilling #10-16 TEK screws to each rim piece. Joists secured to joist rims with three 3/4 in. TEK screws secured through both legs of minimum 2 in. by 2 in. by 6 in. long steel angles.

**2A. Bridging** — (Not Shown) — For use with Item 2 — Location of lateral bracing to be specified on truss engineering. 10 in. deep section of joist (Item 2) with notches cut for securement to joists (Item 2). Bridging secured with three 3/4 in. TEK screws secured through both legs of minimum 2 in. by 2 in. by 6 in. long steel angles.

**2B. Structural Steel Members\*** — 1-3 Hr Rating - JoistRite channel-shaped joists, min 10. deep with min 2 in. wide flanges and 3/4 in. long stiffening flanges. JoistRite rim track, min 10 in. deep with min 1-1/2 in. top flange and min 2-5/16 in. bottom flange. The joists and rim tracks are fabricated from min 16 MSG galv steel. Joists spaced max 24 in. OC. Floor joists attached to rim track using channel-shaped steel web stiffeners. At rim track splices bearing on supports, rim tracks are connected using an overlapping section of a 12 in. long splice plate, with four 3/4 in. long self-drilling #10 screws to each rim piece.

**MARINO/WARE, DIV OF WARE INDUSTRIES INC** — Type JR JoistRite floor joists, Type JT JoistRite rim track

**2B1. Blocking & Bridging** — Installed before construction loads are applied. The blocking consists of JoistRite solid blocking placed between each joist. Blocking should be installed max. 7 ft. OC along the joist length. Blocking attached to the top and bottom joist flanges with one #10 3/4 in. long self-drilling screw at each end tab of blocking. Blocking is fabricated from min 18 MSG galv steel, min 1-15/16 in. flanges, having the same depth as the joists. In addition, bridging consists of 1/2 in. by 1-1/2 in. cold-rolled channel, min No. 16 GA, attached to the bottom flanges of the joists and blocking. Cold-rolled channel attached to each blocking bottom flange with four #10 3/4 in. long self-drilling screws and to joist bottom flange with two screws.

**2B2. Web Stiffeners** — Not Shown — JoistRite web stiffeners, min 3-5/8 in. wide with min 9/16 in. flange and min 1-1/4 in. flange, having the same depth as the joists. Fabricated from min 16 MSG galv steel. Secured to each joist and track with #10 3/4

in. long self-drilling screws.

**2C. Structural Steel Members\* — 1-2 Hr Rating** - The proprietary joists are channel-shaped, 10 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.

**2D. 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.

**3. Resilient Channels** — 1/2 in. deep, min. 2 in. wide formed of 25 MSG galv steel with a 1/2 in. fastening surface, spaced 12 in. OC perpendicular to joists. Channel splices overlapped 3 in. beneath steel joists. Channels secured to each joist with 1/2 in. Type S-12 pan head screws. Channels oriented opposite at wallboard butt joints (spaced 6 in. OC) as shown in the above illustration.

**3A. Steel Framing Members\* — (Optional, Not Shown)** — As an alternate to Item 3 - For 1-2 Hr Rating Only.

**a. Furring Channels** — Formed of No. 25 MSG galv steel, nominal 2-1/2 in. wide by 7/8 in. deep, spaced 12 in. OC, perpendicular to the joists. Channels secured to Cold Rolled Channels at every intersection with a 3/4 in. TEK screw through each furring channel leg. Ends of adjoining channels overlapped 12 in. and fastened together with two double strand No. 18 SWG galv steel wire ties, one at each end of overlap, or with two 3/4 in. TEK screws in each leg of the overlap section. Two furring

channels positioned 3 in. OC, 1-1/2 in. on each side of gypsum board (Items 4, 5, and 6) end joints, each extending a min of 6 in. beyond both side edges of the board.

b. **Cold Rolled Channels** — 1-1/2 in. by 1/2 in., formed from No. 16 ga. galv steel, positioned vertically and parallel to joists, friction-fitted into the channel caddy on the Steel Framing Members (Item 3Ac) and secured with two 3/4 in. TEK screws. Adjoining lengths of cold rolled channels lapped min. 12 in. and secured along bottom legs with four 3/4 in. TEK screws and wire-tied together with two double strand 18 SWG galv steel wire ties, one at each end of overlap.

c. **Steel Framing Members\*** — Spaced 48 in. OC. max along joist, and secured to the joist on alternating joists with two, No. 10-16 TEK screws through mounting holes on the hanger bracket.

**PAC INTERNATIONAL L L C** — Type RSIC-SI-CRC EZ Clip

**3B. Steel Framing Members\*** — (Optional, Not Shown) — As an alternate to Item 3 - For 1-2 Hr Rating Only.

a. **Furring Channels** — Formed of No. 25 MSG galv steel, nominal 2-1/2 in. wide by 7/8 in. deep, spaced 12 in. OC perpendicular to joists and friction fit into Steel Framing Members (Item 3Bb). 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 or with two TEK screws along each leg of the 6 in. overlap. Two furring channels positioned 6 in. OC, 3 in. on each side of gypsum board (Items 4, 5, and 6) end joints. Butt joint channels held in place by strong back channels placed upside down, on top of, and running perpendicular to primary furring channels, extending 6 in. longer than length of gypsum side joint. Strong back channels spaced maximum 48 in. OC. Strong back channels secured to every intersection of primary furring channels with four 7/16 in. pan head screws, two along each of the legs at intersections. Butt joint channels run perpendicular to strong back channels and shall be minimum 6 in. longer than length of joint, secured to strong back channels with 7/16 in. pan head screws, two along each of the legs at intersection with strong back channels.

b. **Steel Framing Members\*** — Used to attach furring channels (Item 3Ba) to joists. Clips spaced 48 in. OC and secured along joist webs at each furring channel intersection with min. 3/4 in. long self-drilling No. 10-16 TEK screws through each of the provided hole locations. Furring channels are friction fitted into

clips.

**PAC INTERNATIONAL L L C** — Type RSIC-S1-1 Ultra

**4. Gypsum Board\*** — For 1 hour rating and base layer of 2 hour system — Single layer of nom 5/8 in. thick, 48 in. wide gypsum panels installed with long dimension perpendicular to resilient channels and side joints centered between joists. Gypsum panels secured with 1-1/4 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 3 ft.

When **Steel Framing Members** (Item 3A) are used, one layer of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 4.

When **Steel Framing Members** (Item 3B) are used, one layer of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 4.

**NATIONAL GYPSUM CO** — Type FSW-C

**5. Gypsum Board\*** — For 1-1/2 Hour Rating — Two layers of nom 5/8 in. thick, 48 in. wide gypsum panels. Base layer installed per Item 4. Face layer installed with long dimension perpendicular to resilient channels and side joints centered between joists, staggered 24 in. OC from base layer. Gypsum panels secured with 1-5/8 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 3 ft.

When **Steel Framing Members** (Item 3A) are used, two layers of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 5.

When **Steel Framing Members** (Item 3B) are used, two layers of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 5.

Any 5/8 in. thick, 4 ft. wide, Gypsum Board UL Classified for Fire Resistance (CKNX) eligible for use in Design Nos. U305 and L501.

**6. Gypsum Board\*** — For 2 Hour Rating — Two layers of nom 5/8 in. thick, 48 in. wide gypsum panels. Base layer installed with long dimension perpendicular to resilient channels and side joints centered between joists. Gypsum panels secured with 1-1/4 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 4 ft. Face layer installed with long dimension perpendicular to resilient channels and side joints centered between joists, staggered 24 in. OC from base layer. Gypsum panels secured with 1-5/8 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 4 ft. Butt joints of face layer offset minimum 2 ft. from butt joints of base layer.

When **Steel Framing Members** (Item 3A) are used, two layers of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 6.

When **Steel Framing Members** (Item 3B) are used, two layers of nom 5/8 in. thick, 4 ft wide gypsum board, installed as described in Item 6.

**NATIONAL GYPSUM CO** — Type FSW-C

7. **Batts and Blankets\*** — Mineral wool or glass fiber insulation, min 6 in. thick, bearing the UL Classification Marking for Surface Burning Characteristics. Insulation fitted in the concealed space, draped over the resilient channels.

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.

#### **For 3 Hour Rating - Ceiling System:**

9. **Building Units\*** — Nom 5/8 in. thick. Long dimension of panels to be perpendicular to resilient channels with end joints staggered a min of 2 ft. Side joints of board shall be a minimum of 4 in. from joists (Item 2B). Panels secured to resilient channels with #8 by 1-1/4 in. long Type S bugle head screws spaced a max of 6 in. OC. in the field with screws located 1 in. from side edges and 3 in. from end joints.

**EXTREMEGREEN BUILDING PRODUCTS LLC** — Type 5/8 in. Tapered Extremegreen™ Board

10. **Gypsum Board\*** — One layer of nom 5/8 in. thick, 48 in. wide gypsum panels installed as the face layer over the Building Units (Item 9) with long dimension perpendicular to resilient channels. Gypsum panels secured with 2-1/4 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. As an alternative, gypsum board may be installed as the base layer. If base layer, gypsum panels secured with 1-1/4 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. Screws in Item 9 increased to 2 in. long Type S and secured per Item 9. Setting compound (Item 9) required regardless of order.

**NATIONAL GYPSUM CO** — Type FSW-C

11. **Joint Tape** — (Not Shown - For use with item 9 - face or base layer) Nom 1-7/8 in. wide fiberglass tape embedded in first layer of setting compound over all joints.

**12. Setting Compound — Wall and Partition Facings and Accessories\* —** (Not Shown - For use with item 9-face or base layer) Dry setting compound mixed with water and applied in two coats to joints and screw-heads. Upon completion of finishing board joints and screw heads, a skim coat of setting compound shall be applied to the entire surface of ceiling board.  
**EXTREMEGREEN BUILDING PRODUCTS LLC — Extremegreen™ Fire Set 60**

**13. Joint Treatment —** (Not Shown - For Use with Item 10 when Gypsum Board is face layer) — 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.

**\* 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 2019-10-16

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### **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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