



# BXUV.U435

## 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

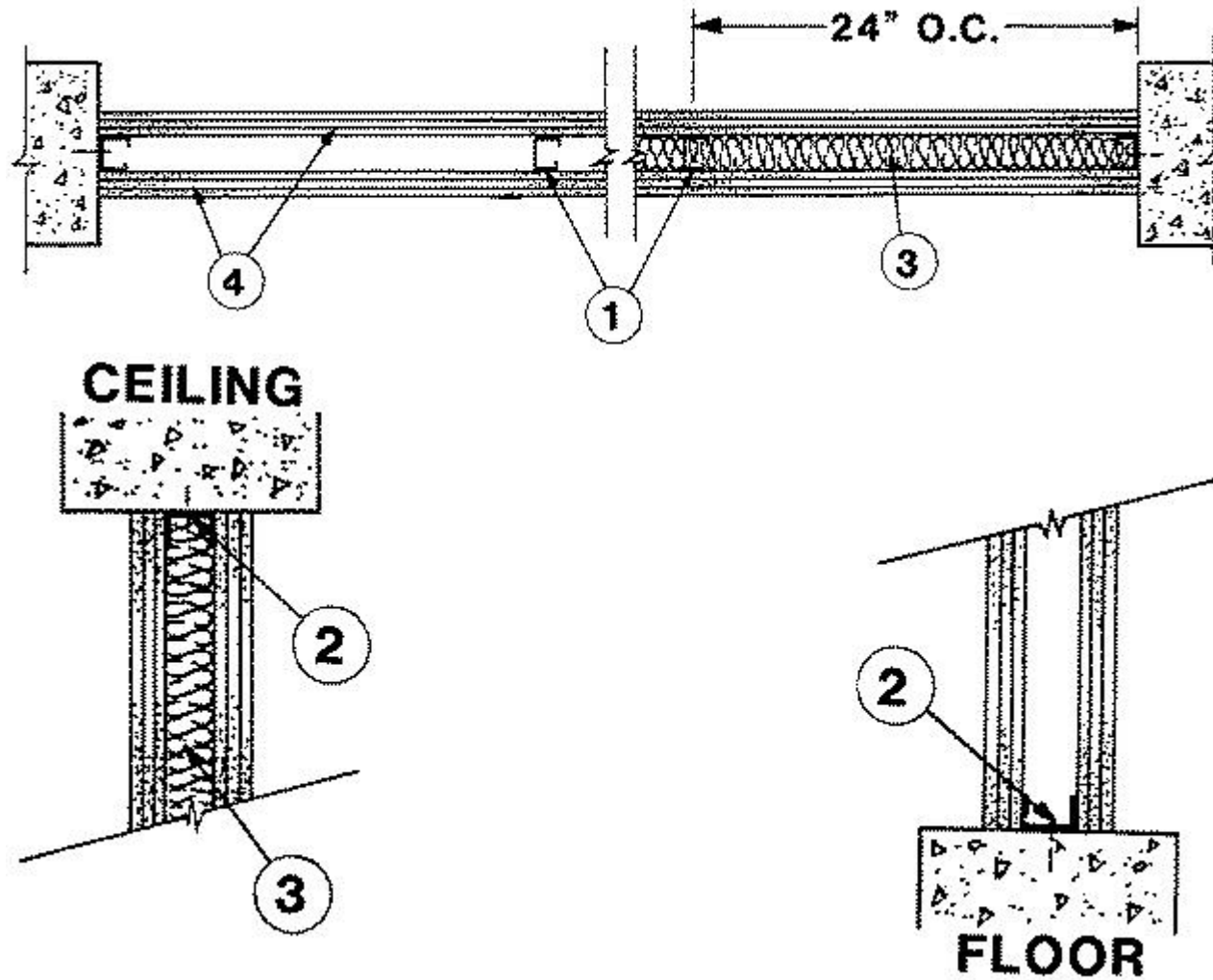
## Design No. U435

May 28, 2020

**Assembly Rating — 3 Hr or 4 Hr (See Item 4)**

**Nonbearing Wall**

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



1. **Studs** — Channel-shaped, 1-5/8 in. wide by 1-1/4 in. deep, with 5/16 in. folded back return flange legs. Fabricated from No. 25 MSG galvanized steel. Stud spacing 16 or 24 in. OC. Studs to be cut 1 in. less than assembly height.

1A. **Framing Members\* — Steel Studs** — As an alternate to Item 1 — Channel shaped studs, min 1-5/8 in. wide, spaced a max of 24 in. OC. Studs to be cut 1 in. less than assembly height.

**ALLSTEEL & GYPSUM PRODUCTS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

**CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV** — Type SUPREME D24/30EQD and Type SUPREME D20

**QUAIL RUN BUILDING MATERIALS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

**SCAFCO STEEL STUD MANUFACTURING CO** — Type SUPREME D24/30EQD and Type SUPREME D20

**STEEL CONSTRUCTION SYSTEMS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

**UNITED METAL PRODUCTS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

1B. **Framing Members\* — Steel Studs** — Not Shown — In lieu of Item 1 — For use with Item 2B, proprietary channel shaped steel studs, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.018 in. thick galv steel. Attached to floor and ceiling with fasteners spaced 24 in. OC max. Studs to be cut 1 in. less than assembly height.

**CALIFORNIA EXPANDED METAL PRODUCTS CO** — Viper20™

**MARINO/WARE, DIV OF WARE INDUSTRIES INC** — Viper20™

**FUSION BUILDING PRODUCTS** — Viper20™

**IMPERIAL MANUFACTURING GROUP INC** — Viper20™

1C. **Framing Members\* — Steel Studs** — Not Shown — In lieu of Item 1 — For use with Item 2C, proprietary channel shaped steel studs, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.015 in. thick galv steel. Attached to floor and ceiling with fasteners spaced 24 in. OC max. Studs to be cut 1 in. less than assembly height.

**CLARKDIETRICH BUILDING SYSTEMS** — CD ProSTUD

**DMFCWBS L L C** — ProSTUD

**MBA METAL FRAMING** — ProSTUD

**RAM SALES L L C** — Ram ProSTUD

**STEEL STRUCTURAL PRODUCTS L L C** — Tri-S ProSTUD

1D. **Framing Members\* — Steel Studs** — Not Shown — In lieu of Item 1 — For use with Item 2D, proprietary channel shaped steel studs, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.018 in. thick galv steel. Attached to floor and ceiling with fasteners spaced 24 in. OC max. Studs to be cut 1 in. less than assembly height.

**TELLING INDUSTRIES L L C** — TRUE-STUD™

1E. **Framing Members\* — Steel Studs** — (As an alternate to Item 1, For use with Item 4C) Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min width, min 1-1/2 in. flanges and 1/4 in. return, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

1F. **Framing Members\* — Steel Studs** — Not Shown — In lieu of Item 1 — For use with Item 2F, proprietary channel shaped steel studs, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.018 in. thick galv steel. Attached to floor and ceiling with fasteners spaced 24 in. OC max. Studs to be cut 1 in. less than assembly height.  
**TELLING INDUSTRIES L L C** — Viper20™

1G. **Framing Members\* — Steel Studs** — (As an alternate to Items 1 through 1F, for use with item 2G) Channel shaped, min. 1.97 in. wide by 1-1/4 in. deep. Fabricated from 25 MSG galv steel. Stud spacing 16 or 24 in. OC. Studs to be cut 1 in. less than assembly height.  
**KIRII (HONG KONG) LTD** — Type KIRII

1H. **Framing Members\* — Steel Studs** — In lieu of Item 1 — For use with Item 2H, proprietary channel shaped steel studs, min 1-5/8 in. wide (SmartStud20™), min 3-5/8 in. wide (SmartStud25™). Stud spacing 16 or 24 in. OC. Studs to be cut 1 in. less than assembly height.  
**CRACO MFG INC** — SmartStud25™, SmartStud20™

1I. **Framing Members\* — Steel Studs** — Channel-shaped, 1-5/8 in. wide by 1-1/4 in. deep. Fabricated from No. 25 MSG galvanized steel. Stud spacing 16 or 24 in. OC. Studs to be cut 1 in. less than assembly height.  
**EB METAL INC** — NITROSTUD

1J. **Framing Members\* — Steel Studs** — (As an alternate to Items 1 through 1I) Channel-shaped, min. 1-5/8 in. deep by min. 1-1/4 in. wide. Fabricated from No. 25 MSG galvanized steel. Stud spacing 16 or 24 in. OC. Studs to be cut 1 in. less than assembly height.  
**OLMAR SUPPLY INC** — PRIMESTUD

1K. **Framing Members\* — Steel Studs** — As an alternate to Item 1 through 1J — For use with Item 2B (3-5/8 in. wide track), channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, 1-1/4 in. wide by 3-5/8 in. deep, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.  
**MARINO/WARE, DIV OF WARE INDUSTRIES INC** — StudRite™

1L. **Framing Members\* — Steel Studs** — As an alternate to Item 1 - For use with Item 2I, channel shaped, min 3-5/8 in. wide, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.  
**BAILEY METAL PRODUCTS LTD** — Type PLATINUM PLUS

1M. **Framing Members\* — Steel Studs** — Not Shown — In lieu of Item 1 — For use with Item 2J, proprietary channel shaped steel studs, 1-1/4 in. deep by min 3-1/2 in. wide fabricated from min 0.018 in. thick galv steel. Attached to floor and ceiling with fasteners spaced 24 in. OC max. Studs to be cut 1 in. less than assembly height.  
**RESCUE METAL FRAMING, L L C** — AlphaSTUD

1N. **Framing Members\* — Steel Studs** — As an alternate to Item 1 - For use with Item 2K - Channel-shaped, min. 1-5/8 in. deep by min. 1-1/4 in. wide. Fabricated from No. 25 MSG galvanized steel. Stud spacing 16 or 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.  
**OEG BUILDING MATERIALS** — OEG Stud

1O. **Framing Members\* — Steel Studs** — Not Shown — In lieu of Item 1 — For use with Item 2L, proprietary channel shaped steel studs, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 25 MSG (0.018 in. min. bare metal thickness). Attached to floor and ceiling with fasteners spaced 24 in. OC max. Studs to be cut 1 in. less than assembly height.  
**CALIFORNIA EXPANDED METAL PRODUCTS CO** — Viper X

1P. **Framing Members\* — Steel Studs** — In lieu of Item 1 — For use with Item 2M, channel shaped studs, min 1-5/8 in. deep, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.  
**ALLSTEEL & GYPSUM PRODUCTS INC** — Type SUPREME D25

**CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV** — Type SUPREME D25

**QUAIL RUN BUILDING MATERIALS INC** — Type SUPREME D25

**SCAFCO STEEL STUD MANUFACTURING CO** — Type SUPREME D25

**STEEL CONSTRUCTION SYSTEMS INC** — Type SUPREME D25

**UNITED METAL PRODUCTS INC** — Type SUPREME D25

2. **Floor and Ceiling Runners** — Channel-shaped runners, min 1-5/8 in. wide by 1-1/4 in. deep, fabricated from No. 25 MSG galvanized steel. Attached to floor and ceiling with fasteners spaced 24 in. OC max.

2A. **Framing Members\* — Floor and Ceiling Runners** — As an alternate to Item 2 — Channel shaped, min 1-5/8 in. wide, attached to floor and ceiling with fasteners 24 in. OC. max.  
**ALLSTEEL & GYPSUM PRODUCTS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

**CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV** — Type SUPREME D24/30EQD and Type SUPREME D20

**QUAIL RUN BUILDING MATERIALS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

**SCAFCO STEEL STUD MANUFACTURING CO** — Type SUPREME D24/30EQD and Type SUPREME D20

**STEEL CONSTRUCTION SYSTEMS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

**UNITED METAL PRODUCTS INC** — Type SUPREME D24/30EQD and Type SUPREME D20

2B. **Framing Members\* — Floor and Ceiling Runner** — Not Shown — In lieu of Item 2 — For use with Item 1B, proprietary channel shaped runners, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

**CALIFORNIA EXPANDED METAL PRODUCTS CO** — Viper20™ Track

**MARINO/WARE, DIV OF WARE INDUSTRIES INC** — Viper20™ Track

**FUSION BUILDING PRODUCTS** — Viper20™ Track

**IMPERIAL MANUFACTURING GROUP INC** — Viper20™ Track

2C. **Framing Members\* — Floor and Ceiling Runners** — Not Shown — In lieu of Item 2 — For use with Item 1C, proprietary channel shaped runners, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.015 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

**CLARKDIETRICH BUILDING SYSTEMS** — CD ProTRAK

**DMFCWBS L L C** — ProTRAK

**MBA METAL FRAMING** — ProTRAK

**RAM SALES L L C** — Ram ProTRAK

**STEEL STRUCTURAL PRODUCTS L L C** — Tri-S ProTRAK

2D. **Framing Members\* — Floor and Ceiling Runners** — Not Shown — In lieu of Item 2 — For use with Item 1D, proprietary channel shaped runners, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

**TELLING INDUSTRIES L L C** — TRUE-TRACK™

2E. **Framing Members\* — Floor and Ceiling Runners** — (Not Shown) — For use with Item 1E- Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, min width to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners spaced max 24 in. OC.

2F. **Framing Members\* — Floor and Ceiling Runner** — Not Shown — In lieu of Item 2 — For use with Item 1F, proprietary channel shaped runners, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

**TELLING INDUSTRIES L L C** — Viper20™ Track

2G. **Framing Members\* — Floor and Ceiling Runners** — (Not Shown) — For use with Item 1G - proprietary channel shaped runners, 1-1/4 in. deep by min 1.97 in. wide fabricated from 25MSG galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

**KIRII (HONG KONG) LTD** — Type KIRII

2H. **Framing Members\* — Floor and Ceiling Runners** — (Not Shown) — In lieu of Item 2 — For use with Item 1H - proprietary channel shaped runners, min 1-5/8 in. wide (SmartTrack20™), min 3-5/8 in. wide (SmartTrack25™), attached to floor and ceiling with fasteners 24 in. OC max.

**CRACO MFG INC** — SmartTrack25™, SmartTrack20™

2I. **Framing Members\* — Floor and Ceiling Runners** — (Not Shown) — As an alternate to Item 2 - For use with Item 1L. Channel shaped, attached to floor and ceiling with fasteners 24 in. OC. max.

**BAILEY METAL PRODUCTS LTD** — Type PLATINUM PLUS

2J. **Framing Members\* — Floor and Ceiling Runners** — Not Shown — In lieu of Item 2 — For use with Item 1M, proprietary channel shaped runners, 1-1/4 in. deep by min 3-1/2 in. wide fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

**RESCUE METAL FRAMING, L L C** — AlphaTRAK

2K. **Framing Members\* — Floor and Ceiling Runners** — (Not Shown) — As an alternate to Item 2 - For use with Item 1N. Channel shaped, attached to floor and ceiling with fasteners 24 in. OC. max.

**OEG BUILDING MATERIALS** — OEG Track

2L. **Framing Members\* — Floor and Ceiling Runner** — Not Shown — In lieu of Item 2 — For use with Item 1O, proprietary channel shaped runners, 1-1/4 in. deep by min 1-5/8 in. wide fabricated from min 25 MSG (0.018 in. min. bare metal thickness), attached to floor and ceiling with fasteners spaced 24 in. OC max.

**CALIFORNIA EXPANDED METAL PRODUCTS CO** — Viper X Track

2M. **Framing Members\* — Floor and Ceiling Runners** — (Not Shown) — In lieu of Item 2 - For use with Item 1P. Channel shaped, min. 1-5/8 in. deep, attached to floor and ceiling with fasteners 24 in. OC. max.

**ALLSTEEL & GYPSUM PRODUCTS INC** — Type SUPREME D25

**CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV** — Type SUPREME D25

**QUAIL RUN BUILDING MATERIALS INC** — Type SUPREME D25

**SCAFCO STEEL STUD MANUFACTURING CO** — Type SUPREME D25

**STEEL CONSTRUCTION SYSTEMS INC** — Type SUPREME D25

**UNITED METAL PRODUCTS INC** — Type SUPREME D25

3. **Batts and Blankets\*** — (Optional) — Mineral wool insulation, partially or completely filling stud cavity.

**INDUSTRIAL INSULATION GROUP L L C** — Type SAFB

**JOHNS MANVILLE** — Type SAFB

**ROCK WOOL MANUFACTURING CO** — Delta Board

**ROCKWOOL** — Type AFB, min. density 1.8 pcf / 28.8 kg/m<sup>3</sup>

**THERMAFIBER INC** — Type SAFB, SAFB FF

3A. **Fiber, Sprayed\*** — As an alternate to Batts and Blankets (Item 3) — (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/ft<sup>3</sup>. Alternate Application Method: The fiber is applied without water or adhesive at a nominal dry density of 3.5 lb/ft<sup>3</sup>, in accordance with the application instructions supplied with the product.

**U S GREENFIBER L L C** — INS735, INS745, INS750LD for use with wet or dry application. INS765LD and INS773LD are to be used for dry application only.



3B. **Fiber, Sprayed\*** — As an alternate to Batts and Blankets (Item 3) - 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

3C. **Fiber, Sprayed\*** — As an alternate to Batts and Blankets (Item 3) — 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/ft<sup>3</sup>.  
**INTERNATIONAL CELLULOSE CORP** — Celbar-RL

3D. **Fiber, Sprayed\*** — As an alternate to Batts and Blankets (Item 3) — 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. To facilitate the installation of the material, any thin, woven or non-woven netting may be attached by any means possible to the outer face the studs. The material shall reach equilibrium moisture content before the installation of materials on either face of the studs. The minimum dry density shall be 5.79 lbs/ft<sup>3</sup>.  
**APPLEGATE HOLDINGS L L C** — Applegate Advanced Stabilized Cellulose Insulation

4. **Gypsum Board\*** — 1/2 in. thick, 4 ft wide with square or tapered edges. **For 4 Hr Rating** Four layers of gypsum board to be used. Inner layers to be applied vertically with joints centered over studs. Outer layer may be applied vertically or horizontally. First layer fastened to each stud with 1 in. long Type S screws. Second layer fastened to each stud through the first layer with 1-5/8 in. long, Type S screws. Third layer fastened to each stud through the first and second layers with 2-1/4 in. long, Type S screws. Fourth layer fastened to each stud through the first, second and third layers with 2-5/8 in. long, Type S screws. First layer screws shall be located 5 in. from top and bottom of wall with a maximum spacing of 48 in. O.C. vertically between top and bottom screws. Second and third layer screws shall be located 4 and 3 in., respectively, from the top and bottom of wall with the same vertical spacing as the first layer screws. Fourth layer screws shall be located 2 in. from top and bottom of wall and spaced 12 in. OC vertically. Each fourth layer horizontal board end shall be centered over and secured to the stud with screws spaced 1/2 in. from end joint and 12 in. OC vertically. Board end joints shall be staggered. At board side joints all screws shall be located 1/2in. from the joints. Fourth layer also secured to the second and third layers with 1-1/2in. long, Type G, self-tapping steel screws located midway between studs and 1 in. from the horizontal joint. Joints in each layer of gypsum board to be staggered from the joints in the adjacent layer and on opposite sides of studs.

**For 3 hr rating** — Three layers of gypsum board to be used. Inner layers to be applied vertically with joints centered over studs. Outer layer may be applied vertically or horizontally. First layer fastened to each stud with 1 in. long, Type S screws. Second layer fastened to each stud through the first layer with 1-5/8 in. long, Type S screws. Third layer fastened to each stud through the first and second layers with 2-1/4 in. long, Type S screws. First and second layer screws shall be locate 4 and 3 in. from top and bottom of wall, respectively, with a maximum spacing of 48 in. OC vertically. The third layer screws shall be located 2 in. from top and bottom of wall with a maximum spacing of 12 in. OC vertically. Each third layer horizontal board end shall be centered over and secured to the stud with Type S screws spaced 1/2 in. from end joint and 12 in. OC vertically. Third layer, also secured to the first and the second layers with 1-1/2 in. long, Type G, Self-tapping steel screws located midway between studs and 1 in. from the horizontal joint. Board end joints shall be staggered. Vertical board joints to be staggered from the joints in the adjacent layer and on opposite sides of studs.

**AMERICAN GYPSUM CO** — Types AG-C.

**CABOT MANUFACTURING ULC** — Type C

**CERTAINTED GYPSUM INC** — Type C

**CGC INC** — Types C, IP-X2 IPC-AR.

**CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C** — Type LGFC-C/A.

**GEORGIA-PACIFIC GYPSUM L L C** — Types 5, DAPC, TG-C.

**NATIONAL GYPSUM CO** — Types eXP-C, FSK-C, FSW-G, FSW-C, FSMR-C.

**PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM** — Type PG-C.

**SAINT-GOBAIN GYPROC MIDDLE EAST FZE** — Type Gyproc FireStop, Gyproc FireStop MR, Gyproc FireStop M2TECH, Gyproc FireStop ACTIV'Air, Gyproc FireStop MR ACTIV'Air, Gyproc FireStop M2TECH ACTIV'Air

**THAI GYPSUM PRODUCTS PCL** — Type C.

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

**USG BORAL DRYWALL SFZ LLC** — Type C

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

**For 3 hr rating** — Two layers of 3/4 in. thick, 4 ft wide applied to each side of the steel studs. Inner layers to be applied vertically with joints centered over studs and staggered on opposite sides of studs. Outer layers to be applied horizontally with vertical butt joints staggered from inner layer joints or vertically with joints centered over studs and staggered on opposite sides of studs.

Inner layer secured with 1-1/4 in. long Type S self-drilling, self-tapping steel screws spaced 24 in. OC along the perimeter and in the field. Outer layer, when secured horizontally, secured with 2-1/4 in. long Type S self-drilling, self-tapping steel screws spaced 24 in. OC along the perimeter and in the field along the horizontal joints of the outer layer, 1-1/2 in. long Type G self-drilling, self-tapping steel screws to be applied midway between the studs (24 in. OC) and 1 in. from the longitudinal joint. Outer layer, when secured vertically, secured with 2-1/4 in. long Type S self-drilling, self-tapping steel screws spaced 24 in. OC along the perimeter and in the field.

**CGC INC** — Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC.

**UNITED STATES GYPSUM CO** — Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC.

**USG BORAL DRYWALL SFZ LLC** — Type ULTRACODE

**USG MEXICO S A D E C V** — Type IP-X3, ULTRACODE, ULTRACODE SHC or ULTRACODE WRC.

4A. **Gypsum Board\*** — (As an alternate to Item 4) — 5/8 in. thick. **For 4 hr Rating** — Four layers of gypsum board installed as described in Item 4, with fourth layer screw length increased by 1/4 in. **For 3 hr Rating** — Three layers of gypsum board installed as described in Item 4.

**CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C** — Type LGFC-C/A

**NATIONAL GYPSUM CO** — Type FSMR-C.

**UNITED STATES GYPSUM CO** — Type ULIX

4B. **Gypsum Board\*** — (As an alternate to Item 4) — 5/8 in. thick. **For 3 hr Rating** — Three layers of gypsum board installed as described in Item 4.

**CONTINENTAL BUILDING PRODUCTS OPERATING CO, L L C** — Types LGFC6A, LGFC-WD, and LGFC2A.

4C. **Gypsum Board\*** — (Not Shown) — (As an alternate to Item 4 when used as the base layer on one or both sides of wall. For direct attachment only to steel studs Item 2C spaced 16 in. OC) - Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.

**RAY-BAR ENGINEERING CORP** — Type RB-LBG

4D. **Gypsum Board\*** — (Not Shown) — (As an alternate to Item 4 when used as the base layer on one or both sides of wall. For direct attachment only to steel studs Item 2C spaced 16 in. OC) - Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 6A) or Lead Discs (see Item 7A).

**MAYCO INDUSTRIES INC** — Type X-Ray Shielded Gypsum

4E. **Gypsum Board\*** — (Not Shown) — (As an alternate to Item 4 when used as the base layer on one or both sides of wall. For direct attachment only to steel studs Item 2C spaced 16 in. OC). Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

**RADIATION PROTECTION PRODUCTS INC** — Type RPP - Lead Lined Drywall

5. **Joint Tape and Compound** — Vinyl or casein, 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.

6. **Lead Batten Strips** — (Not Shown, For Use With Item 4C) — Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum board (Item 4C) and optional at remaining stud locations. Required behind vertical joints.

6A. **Lead Batten Strips** — (Not Shown, for use with Item 4D) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

7. **Lead Discs or Tabs** — (Not Shown, For Use With Item 4C) — Used in lieu of or in addition to the lead batten strips (Item 6) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 4C) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

7A. **Lead Discs** — (Not Shown, for use with Item 4D) — Max 5/16 in. diam by max 0.140in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "B, C or D".

8. **Barrier Mesh** — (Optional, Not Shown) - Attached to steel studs on one or both sides of the wall using Barrier Mesh Clips spaced at maximum 12 inches on center vertically, using a flat head type screw penetrating through the steel at least 3/8 of an inch. For Steel Studs less than 0.033 inches in thickness, use self-piercing screws. For Steel Studs equal to or greater than 0.033 inches in thickness, use steel drill screws (self-tapping). Gypsum Board (Item 4) to be installed directly over the Barrier Mesh using prescribed screw patterns with lengths increased by a minimum 1/8 in. Barrier Mesh may be installed with the long dimension of the diamond pattern positioned vertically or horizontally. Barrier Mesh joints may occur as butt joints at the framing members and secured using the Barrier Mesh Clips or occur in between framing members as overlapping joints secured using 18 SWG wire ties spaced a maximum 12 in. on center.

**CLARKDIETRICH BUILDING SYSTEMS** — Barrier Mesh, Barrier Mesh Clips

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

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