

Design No. P519

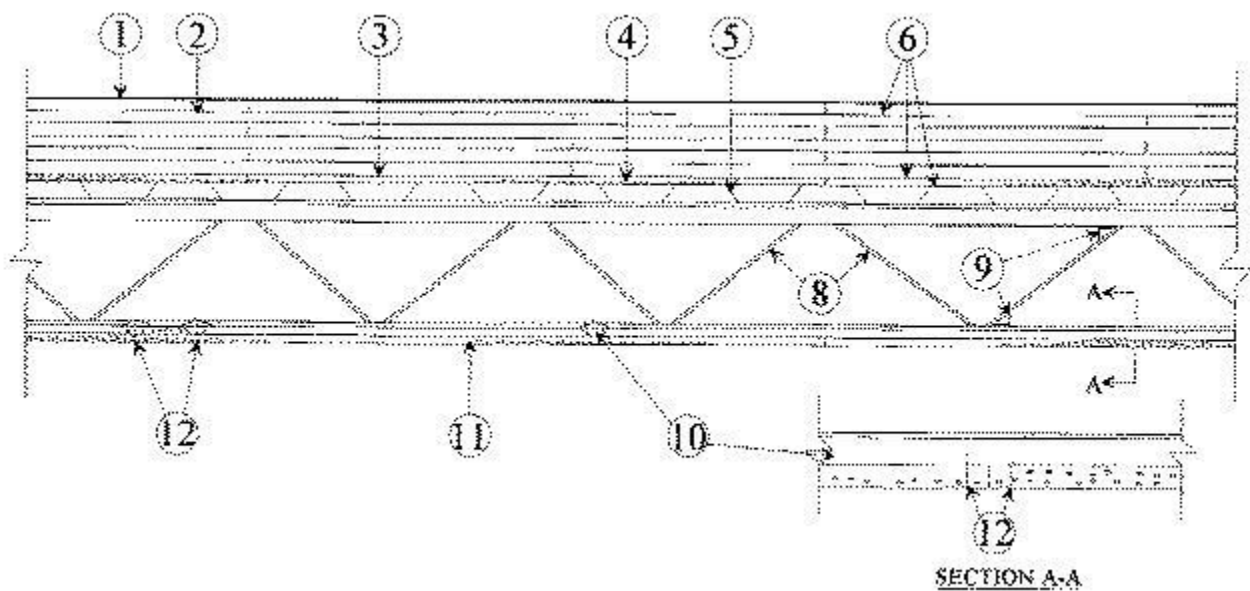
July 14, 2020

Restrained Assembly Rating — 1 and 2 Hr. (See Items 2B, 10, 10A, 11 and 11A)

Unrestrained Assembly Rating — 1 and 2 Hr. (See Items 2B, 10, 10A, 11 and 11A)

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 **Roof Covering Materials** (TEVT).

1A. In lieu of Item 1, roof covering consisting of single-ply **Roofing Membrane*** that is either ballasted, adhered or mechanically attached as permitted under the respective manufacturer's Classification.

See Fire Resistance Directory **Roofing Membranes** (CHCI).

2. Mineral and Fiber Boards* — 24 by 48 in. min size, max size 48 by 96 in. to be applied in one or more layers. Boards to be installed perpendicular to gypsum wallboard direction with end joints staggered 2 ft in adjacent rows. When applied in more than one layer, each layer of board to be offset in both directions from layer below a min of 12 in. in order to lap all joints. Min thickness 1 in. (no limit on max overall thickness).

When only one layer is used, it may be bonded to gypsum wallboard or laid loosely. When two or more layers are used, the insulation may be fastened to steel roof deck (through wallboard) with mechanical fasteners (Item 7) and/or bonded to wallboard or vapor barrier and/or bonded to additional layers of insulation with adhesive (Item 6) or hot asphalt (Item 6A). Adhesive may be omitted from between components secured together by mechanical fasteners.

GAF — Rigid mineral fiber boards

2A. Roof Insulation — Foamed Plastic* — As an alternate to Item 2, any thickness polystyrene foamed plastic insulation boards bearing the UL Classification Marking, having a density of 2.5 pcf max, shall be installed on top of min 1 in. thick Mineral and Fiber Boards* (Item 2) and covered with either the Built-Up Roof Covering (Item 1) or single-ply Roofing Membrane (Item 1A). The 1 in. thick Mineral and Fiber boards to be installed over the gypsum wallboard (Item 4). See **Foamed Plastic*** (BRYX) category in the Building Materials Directory or **Foamed Plastic*** (CCVW) category in the Fire Resistance Directory for list of manufacturers.

2B. Foamed Plastic* — As an alternate to Items 2 or 2A, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., to be applied in one or more layers over the gypsum wallboard (Item 4). Min thickness is 1.3 in. with no limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. When applied in more than one layer, each layer to be offset in both directions from layer below a min of 6 in. in order to lap all joints.

ATLAS ROOFING CORP — AC Foam II, Tapered AC Foam II, AC Foam II NH, Tapered AC Foam II NH, AC Foam III, AC Foam III NH, Tapered AC Foam III NH, AC Foam IV, AC Foam Supreme, AC Foam Supreme NH, AC Foam Recover Board, AC Foam Recover Board NH

MULE-HIDE PRODUCTS CO INC — POLY ISO 2

DOW ROOFING SYSTEMS L L C — "Dow Termico Polyisocyanurate Insulation", "Dow Termico ISO HP-FR"

DYPLAST PRODUCTS L L C

FIRESTONE BUILDING PRODUCTS CO L L C — "ISO 95+ GL", "ISO 95+ FK", "ISO 95+ CAN", "ISO 95+ GL NH", "ISOGARD HD Composite Board", "RESISTA", "ISOGARD GL", "ISOGARD CG"

GAF — EnergyGuard™, EnergyGuard™ RA, EnergyGuard™ NH.

When EnergyGuard™ or EnergyGuard™ NH are used, all ratings are reduced by 1/2 hr.

HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H Shield, H-Shield-F, H-Shield-CG, H-Shield-C, H-Shield Premier, H-Shield HD Composite, H-Shield HD Composite CG, H-Shield RL, H-Shield CG RL, H Shield NH, H-Shield-F NH, H-Shield-CG NH, H-Shield-C NH, H-Shield Premier NH, H-Shield HD Composite CG NH

MULE-HIDE PRODUCTS CO INC — Poly ISO 1, Tapered Poly ISO 1, Poly ISO 1-DWD, Tapered Poly ISO 1-DWD, Poly ISO 1-HD, Poly ISO 1-HD90, Poly ISO 1-HD-Composite

JOHNS MANVILLE — ENRGY 3 25 psi, ENRGY 3, Tapered ENRGY 3, Tapered ENRGY 3 25 psi, ENRGY 3 AGF, Tapered ENRGY 3 AGF, ENRGY 3 25 psi AGF, Tapered ENRGY 3 25 psi AGF, ENRGY 3 CGF, Tapered ENRGY 3 CGF, ENRGY 3 25 psi CGF, Tapered ENRGY 3 25 psi CGF, ISO-3, Tapered ISO-3, ValuTherm, Tapered ValuTherm, ValuTherm 25 psi, Tapered ValuTherm 25 psi, ValuTherm AGF, Tapered ValuTherm AGF, ValuTherm 25 psi AGF, Tapered ValuTherm 25 psi AGF, ValuTherm CGF, Tapered ValuTherm CGF, ValuTherm 25 psi CGF, Tapered ValuTherm 25 psi CGF

LOADMASTER SYSTEMS INC — Loadmaster Polyisocyanurate Insulation

MARTIN FIREPROOFING CORP — "Perform-A-Deck I"

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — Multi-Max-3, Multi-Max FA-3, Ultra-Max, Ultra-Max Plus, Tapered Ultra-Max Plus, Tapered Thermaroof-3, Tapered Thermaroof FA-3, Tapered Ultra-Max.

SIKA SARNAFIL INC — Sarnatherm-R Insulation, Sarnatherm-R CG Insulation, Sarnatherm-R Tapered Insulation, Sarnatherm-R CG Tapered Insulation

SIPLAST INC — Paratherm G

SOPREMA INC — Sopra-ISO s, Sopra-ISO s Tapered, Sopra-ISO+ s, Sopra-ISO+ s Tapered, Sopra-ISO H+ s, Sopra-ISO H+ s Tapered

VERSICO INC — MP-H, VersiCore MP-H, WeatherBond XP, MP-HF, WeatherBond XP-HF, SecurShield, WeatherBond XFP, SecurShield CD, WeatherBond XFP CD

2C. **Foamed Plastic*** — Optional - (Not Shown) - Used in addition to the foam insulation required to achieve fire rating:

2Ca. **Foamed Plastic*** — Optional - (Not Shown) - Maximum 1 in. thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

FIRESTONE BUILDING PRODUCTS CO L L C — "ISOGARD HD"

2Cb. **Foamed Plastic*** — Optional — (Not Shown) — Maximum 5/8 inch thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — "Ultra-Max HD"

SIKA SARNAFIL INC — "Sarnatherm Roof Board-R"

2Cc. **Foamed Plastic*** — Optional — (Not Shown) — Maximum 1/2 inch thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum

thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — H-Shield HD, H-Shield HD90, H-Shield HD RL, H-Shield HD NH, H-Shield HD90 NH

VERSICO INC — SecurShield HD, WeatherBond XFP HD Cover Board

2Cd. **Foamed Plastic*** — Optional — (Not Shown) — Maximum 1 inch thick polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in. Boards may be applied as the top layer in addition to the specified minimum thickness of any roofing system described herein, as long as the roofing system states that there is no limit on maximum thickness. Joints offset in both directions from layer below.

ATLAS ROOFING CORP — ACFoam HD CoverBoard and ACFoam CoverBoard FR

2D. **Roof Insulation — Foamed Plastic* — As an alternate to Items 2 - 2B** — Polyurethane foamed plastic roof insulation. Formed by the simultaneous spraying of two liquid components applied over gypsum wallboard (item 4) in accordance with the manufacturer's instructions. Min thickness is 1.3. No limit on max overall thickness.

BASF CORP — Types FE348-2.5, FE348-2.8, FE348-3.0, ELASTOSPRAY 81255, ELASTOSPRAY 81285, ELASTOSPRAY 81305, SKYTITE C1

BASF CORP — Elastospray 5100-2.0, Elastospray 5100-2.5, Elastospray 81302, Elastospray 81272, Elastospray Alpha System, Elastospray 81252

3. **Sheathing Material*** — (Optional) — Vinyl film vapor barrier, applied with adhesive to gypsum wallboard. Adjacent sheets overlapped 2 in.

4. **Gypsum Board** — (Classified or unclassified) — Supplied in sheets nom 2 by 4 ft to 4 by 12 ft by nom 5/8 in. thick. Min weight 2.0 pcf. Applied perpendicular to steel roof deck directly with adhesive or laid loosely. End joints to occur over crests of steel roof deck with end joints staggered 2 ft in adjacent rows.

See **Gypsum Board** (CKNX) category for names of manufacturers.

4A. **Gypsum Board*** — (Optional) — 1/4, 3/8 or 1/2 in. thick. gypsum board placed perpendicular to and on top of Item 4. Gypsum board loosely laid or adhered with **Adhesive***. Adhesive applied in approx 1/2 in. wide ribbons 6 in. OC, at rate of 0.4 gal per 100 sq ft. See **Adhesives** (BYWR) category for names of manufacturer's.

CERTAINTED GYPSUM INC — Type Regular

5. **Steel Floor and Form Units*** — Noncomposite fluted or corrugated, min 0.034 in. thick (20 gauge), 1-1/2 in. deep painted or galv steel units. Spacing of welds attaching units to supports shall not exceed 12 in. OC. Adjacent units welded or secured together with No. 12 by 1/2 in. self-drilling, self-tapping steel screws, 36 in. OC along side joints.

CANAM STEEL CORP — Type P-3606 or P-3615

GOODER HENRICHSEN CO. — Type B

NEW MILLENNIUM BUILDING SYSTEMS L L C — Types B, BI, F. Units may be phos/painted or galvanized

VULCRAFT, DIV OF NUCOR CORP — Types 1.5A, 1.5B, 1.5BI, 1.5PLB, 1.5F; Types BW, B High Strength, BW High Strength, N. Units may be phd/ptd

6. **Adhesive** — Optional — May be applied between crests of steel roof deck and gypsum wallboard in 1/2 in. wide ribbons, 6 in. OC at 0.4 gal per 100 sq ft. May also be applied in 1/2 in. wide ribbons 6 in. OC, at 0.4 gal per 100 sq ft between gypsum wallboard and vapor barrier, and between vapor barrier and mineral and fiber boards, or directly between gypsum boards and roof insulation when vapor barrier is omitted. May also be applied at the same rate between layers of roof insulation.

7. **Mechanical Fasteners** — (Not Shown) — Any steel nail or steel clip type fastener designed for the purpose may be used to attach one or more layers of insulation to steel roof deck (through gypsum board). As an alternate, the gypsum wallboard may be attached directly to the steel roof deck with the mechanical fasteners.

7A. **Hot Asphalt or Coal Tar Pitch** — (Not Shown) — May be used as an alternate to adhesive between layers of roof insulation at a rate not to exceed 35 lb per 100 sq ft.

8. **Steel Joists** — Type 10K1, min size, spaced a max 48 in. OC.

9. **Bridging** — Steel bars, 1/2 in. diam welded to top and bottom chords of each joist.

10. **Furring Channels** — For 1 hr restrained and unrestrained assembly rating, No. 26 MSG galv steel 2-9/16 in. or 2-5/8 in. or 2-23/32 in. wide by 7/8 in. deep; spaced 24 in. OC, perpendicular to joists. Two courses of furring channel positioned 6 in. OC, 3 in. from each end of wallboard. Channels secured to each joist with No. 18 SWG galv steel wire double strand saddle ties. Channels spliced below joists with adjoining pieces overlapped 6 in. Channels tied together with double strand No. 18 SWG galv steel wire at each end of overlap. For 2 hr restrained and unrestrained assembly rating, furring channels installed as described above but spaced 16 in. OC max.

10A. **Steel Framing Members*** — (optional, not shown, for 1 hr restrained and unrestrained assembly ratings only) — Alternate method to attach furring channels (Item 10) to joists (Item 8). Clips spaced max 48 in. OC., and secured to joists with cup washer installation kit provided by manufacturer. On underside of bottom chord, 1-1/2 in. dia x 3/8 in. deep #16 galv steel cup washer is placed to surround the rubber insert. Clip attached to the bottom chord with a 1/4 in. dia. zinc plated bolt inserted through the center grommet and between the chord members; depth of bolt determined as 1-1/2 in. plus the depth of the bottom chord of the joist. Fastened on the top side of the bottom chord with a second cup washer placed open side up, and a 1/4 in. zinc plated "Nyloc" nut. Furring channels are friction fitted into clips. RSIC-1 clip for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) clip for use with 2-23/32 in. wide furring channels. 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. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 11.

PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-1 (2.75)

10B. **Steel Framing Members*** — (Optional, not shown, for 1 hr restrained and unrestrained assembly ratings only) — Alternate method to attach furring channels (Item 10) to joists (Item 8). Clips spaced max 48 in. OC., and secured to joists with cup washer installation kit provided by manufacturer. On underside of bottom chord, 1-1/2 in. dia x 3/8 in.

deep #16 galv steel cup washer is placed to surround the rubber insert. Clip attached to the bottom chord with a 1/4 in. dia. zinc plated bolt inserted through the center grommet and between the chord members; depth of bolt determined as 1-1/2 in. plus the depth of the bottom chord of the joist. Fastened on the top side of the bottom chord with a second cup washer placed open side up, and a 1/4 in. zinc plated "Nyloc" nut. Furring channels are friction fitted into clips. 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. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 11.

PLITEQ INC — Type GENIECLIP

10C. **Steel Framing Members*** — (Optional, Not Shown, for 1 hr restrained and unrestrained assembly ratings only) - Used as an alternate method to attach furring channels (item 10) to joists (item 8). Clips spaced at 48" OC and secured to the bottom of the joists with cup washer installation kit provided by manufacturer. On underside of bottom chord, 1-1/2 in. dia x 3/8 in. deep No. 16 galv steel cup washer is placed to surround the rubber insert. Clip attached to the bottom chord with a 1/4 in. dia. zinc plated bolt inserted through the center grommet and between the chord members; depth of bolt determined as 1-1/2 in. plus the depth of the bottom chord of the joist. Fastened on the top side of the bottom chord with a second cup washer placed open side up, and a 1/4 in. zinc plated "Nyloc" nut. Furring channels are then friction fitted into clips. Ends of channels are overlapped 6" and tied together with double strand of No. 18 AWG galvanized steel wire. Additional clips are required to hold the Gypsum Butt joints as described in Item 11.

STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237R

10D. **Steel Framing Members*** — (optional, not shown, for 1 hr restrained and unrestrained assembly ratings only) — Alternate method to attach 2-23/32 in. wide by 7/8 in. or 1-1/2 in. deep furring channels to joists. Clips spaced max 48 in. OC., and secured to joists with cup washer installation kit provided by manufacturer. On underside of bottom chord, 1-1/2 in. dia x 3/8 in. deep #16 galv steel cup washer is placed to surround the rubber insert. Clip attached to the bottom chord with a 1/4 in. dia. zinc plated bolt inserted through the center grommet and between the chord members; depth of bolt determined as 1-1/2 in. plus the depth of the bottom chord of the joist. Fastened on the top side of the bottom chord with a second cup washer placed open side up, and a 1/4 in. zinc plated "Nyloc" nut. Furring channels are friction fitted into clips. 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. Additional clips required to hold furring channel that supports the wallboard butt joints, as described in Item 11.

CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

11. **Gypsum Board*** — For 1 hr restrained and unrestrained assembly rating, one layer 5/8 in. thick, 4 ft wide, installed with long dimension perpendicular to furring channels with side joints located 1 ft from center lines of joists. Wallboard fastened to furring channels with 1 in. wallboard screws spaced 12 in. OC, 3/4 and 3 in. from butted side and end joints, respectively. End joints attached to double channels and protected above with 3 in. wide strips of 5/8 in. thick wallboard. Wallboard joints may be either exposed or covered with joint compound and paper tape. As an alternate, nom 3/32 in. thick gypsum veneer plaster may be applied to the entire surface of Classified veneer baseboard.

When Steel Framing Members (Item 10A, 10B, 10D) are used, wallboard butt joints shall be staggered min. 2 ft. within the assembly, and occur between the main furring channels. Edge joints located 1 ft from center lines of joists. At the wallboard butt joints, each end of the gypsum board shall be supported by a single length of furring channel equal to

the width of the wallboard plus 6 in. on each end. The furring channels shall be spaced approximately 3-1/2 in. OC, and be attached to underside of the joist with one clip at each end of the channel. Gypsum board attached to the furring channels using 1 in. long Type S bugle-head steel screws spaced 8 in. OC along butted end joints and 12 in. OC in the field of the board. Wallboard joints covered with fiber tape and joint compound. Butt joints protected above with 3 in. wide strips of 5/8 in. thick gypsum board.

When **Steel Framing Members** (Item 10C) are used, one layer of nom 5/8 in. thick, 4 ft wide gypsum board is installed with long dimensions perpendicular to furring channels. Gypsum board secured to furring channels with nom 1 in. long Type S bugle-head steel screws spaced 8 in. OC in the field of the board. Gypsum board butted end joints shall be staggered minimum 48 in. and centered over main furring channels. At the gypsum board butt joints, each end of each gypsum board shall be supported by a single length of furring channel equal to the width of the gypsum board plus 3 in. on each end. The two support furring channels shall be spaced approximately 3 in. in from end joint. Screw spacing along the gypsum board butt joint and along both additional channels shall be 8 in. OC. Additional screws shall be placed in the adjacent section of gypsum board into the aforementioned 3 in. extension of the extra butt joint channels as well as into the main channel that runs between. Butt joint furring channels shall be attached with one RESILMOUNT Sound Isolation Clip at each end of the channel.

AMERICAN GYPSUM CO — Type AG-C

CERTAINTED GYPSUM INC — Type C

CGC INC — Type C, IP-X2, ULIX.

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

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

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

PABCO BUILDING PRODUCTS L L C, DBA PABCO GYPSUM — Type C

PANEL REY S A — Type PRC

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

USG BORAL DRYWALL SFZ LLC — Type C

USG MEXICO S A DE C V — Type C, IP-X2

11A. **Gypsum Board*** — For 2 hr restrained and unrestrained assembly rating, two layers nom 1/2 in. thick by 48 in. wide, installed with long dimension perpendicular to furring channels. Inner layer positioned with end joints midway between furring channels. Secured to furring channels with 1 in. long Type S-12 screws spaced 12 in. OC, and located 5/8 in. from side joints and 2 in. from end joints. Outer layer positioned with end joints between furring channels. End joints and side joints offset joints 16 to 32 in. from end and side joints of inner layer. Outer layer secured to furring channels with 1-5/8 in. long Type S-12 screws spaced 12 in. OC. End joints of outer layer attached to inner layer with 1-1/2 in. long Type G bugle-head steel screws spaced 8 in. OC and 3/4 in. from end of boards.

CERTAINTED GYPSUM INC — Type C

GEORGIA-PACIFIC GYPSUM L L C — Type TG-C

UNITED STATES GYPSUM CO — Type C, IP-X2

USG BORAL DRYWALL SFZ LLC — Type C

11B. **Gypsum Board*** — For 2 hr restrained and unrestrained assembly rating, two layers nom 5/8 in. thick by 48 in. wide, installed with long dimension perpendicular to furring channels. Inner layer positioned with end joints midway between furring channels. Secured to furring channels with 1 in. long Type S-12 screws spaced 12 in. OC, and located 5/8 in. from side joints and 2 in. from end joints. Outer layer positioned with end joints between furring channels. End joints and side joints offset joints 16 to 32 in. from end and side joints of inner layer. Outer layer secured to furring channels with 1-5/8 in. long Type S-12 screws spaced 8 in. OC. End joints of outer layer attached to inner layer with 1-1/2 in. long Type G bugle-head steel screws spaced 8 in. OC and 3/4 in. from end of boards.

CGC INC — Type ULIX

UNITED STATES GYPSUM CO — ULIX

12. **Screw, Wallboard** — Case hardened steel, 1 in. long, 0.150 diam shank, self-drilling and self-tapping 0.335 in. diam Phillips type head. Screw heads may be either exposed or covered with joint cement.

*** 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 2020-07-14