UL DESIGNS

Through-penetration Firestop Systems

System No. C-AJ-1364
February 08, 2010

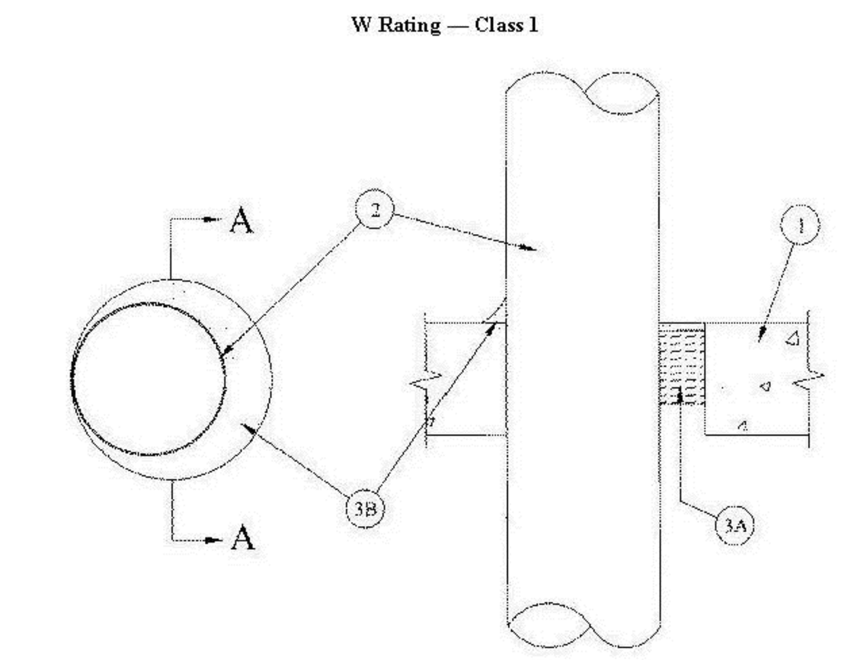
F Rating — 2 Hr

T Rating — 0 Hr

L Rating At Ambient — Less Than 1 CFM/sq ft

L Rating At 400 F — 2 CFM/sq ft

W Rating — Class 1



SECTION A-A

1. **Floor Assembly** — Min 4-1/2 in. (114 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600 - 2400 kg/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 25-7/8 in. (657 mm).

   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants** — One metallic pipe, tubing or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between tube and periphery of opening shall be min 0 in.(point contact) to max 1-7/8 in. (48 mm). Penetrants to be rigidly supported on both sides of floor assembly. The following types and sizes of metallic pipes, tubing or conduit may be used:
   A. **Steel Pipe** — Nom 24 in. (610 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe** — Nom 24 in. (610 mm) diam (or smaller) cast or ductile iron pipe.
   C. **Conduit** — Nom 6 in. (152 mm) diam (or smaller) rigid steel conduit.
   D. **Conduit** — Nom 4 in. (102 mm) (or smaller) steel electrical metallic tubing.
   E. **Copper Tubing** — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tube.
   F. **Copper Pipe** — Nom 6 in. (152 mm) diam (or smaller) Regular (or heavier) copper pipe.
3. **Firestop System** — The details of the firestop system shall be as follows:
   A. **Packing Material** — Min 3 in. (76 mm) thickness of min 4 pcf (64 kg / m^3) mineral wool batt insulation firmly packed into opening as a permanent form. Packing material to be recessed from top surface of floor to accommodate the required thickness of fill material.
   B. **Fill, Void or Cavity Materials* — Sealant** — Min 1/4 in. (6 mm) thickness of fill material applied within the annulus, flush with top surface of floor. Min 1/2 in. (13 mm) diam bead of caulk applied to the penetrant/concrete interface at the point contact location on the top surface of floor.

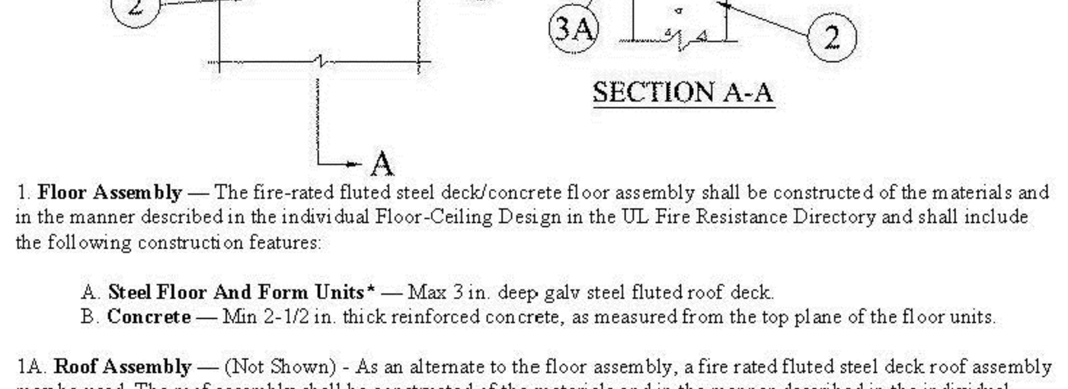
   3M COMPANY — FB-1000 NS, FB-1003 SL or FB-3000 WT

*Bearing the UL Classification Mark

Joint Systems
System No. HW-D-0174

September 28, 2001

Assembly Rating — 2 Hr
L Rating at Ambient - Less than 1 CFM/Lin Ft.
L Rating at 400 F - Less than 1 CFM/Lin Ft.
Nominal Joint Width - 1 in.
Class II Movement Capabilities - 25% Compression & Extension



1. **Floor Assembly** — The fire-rated fluted steel deck/concrete floor assembly shall be constructed of the materials and in the manner described in the individual Floor-Ceiling Design in the UL Fire Resistance Directory and shall include the following construction features:

   A. **Steel Floor And Form Units*** — Max 3 in. deep galv steel fluted roof deck.
   B. **Concrete** — Min 2-1/2 in. thick reinforced concrete, as measured from the top plane of the floor units.

1A. **Roof Assembly** — (Not Shown) - As an alternate to the floor assembly, a fire rated fluted steel deck roof assembly may be used. The roof assembly shall be constructed of the materials and in the manner described in the individual P900 Series Roof-Ceiling Design in the UL Fire Resistance Directory. The hourly rating of the roof assembly shall be equal to or greater than the hourly rating of the wall assembly and shall include the following construction features:

   A. **Steel Roof Deck** — Max 3 in. deep galv steel fluted roof deck.
   B. **Roof Insulation** — Min 2-1/4 in. thick poured insulating concrete, as measured from the top plane of the deck.

2. **Wall Assembly** — Min 6-1/8 in. thick steel-reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***.

   See **Concrete Blocks** (CAZT) category in Fire Resistance Directory for names of manufacturers

3. **Joint System — Max separation between bottom of floor or roof and top of wall is 1 in. The joint system is designed to accommodate a max 25 percent compression or extension from its installed width**. The joint system consists of the following:

   A. **Forming Material*** — Min 4 pcf mineral wool batt insulation cut into min 5-5/8 in. wide strips, compressed approximately 33 percent in thickness to fill the max 1 in. gap between top of wall and bottom of steel floor or roof deck and recessed from both surfaces of wall to accommodate the required thickness of fill material.

   IIG MINWOOL L L C — MinWool-1200 Safing
   ROCK WOOL MANUFACTURING CO — Delta Board or Delta -8
   ROCKWOOL MALAYSIA SDN BHD — Type Safe
   ROXUL INC — Type Safe
   THERMAFIBER INC — Type SAF

   B. **Fill, Void or Cavity Material* - Sealant** — Min 1/4 in. thickness of sealant installed on each side of wall between top of wall and bottom of floor or roof, flush with each surface of wall.

   3M COMPANY — FireBarrier 1000 NS

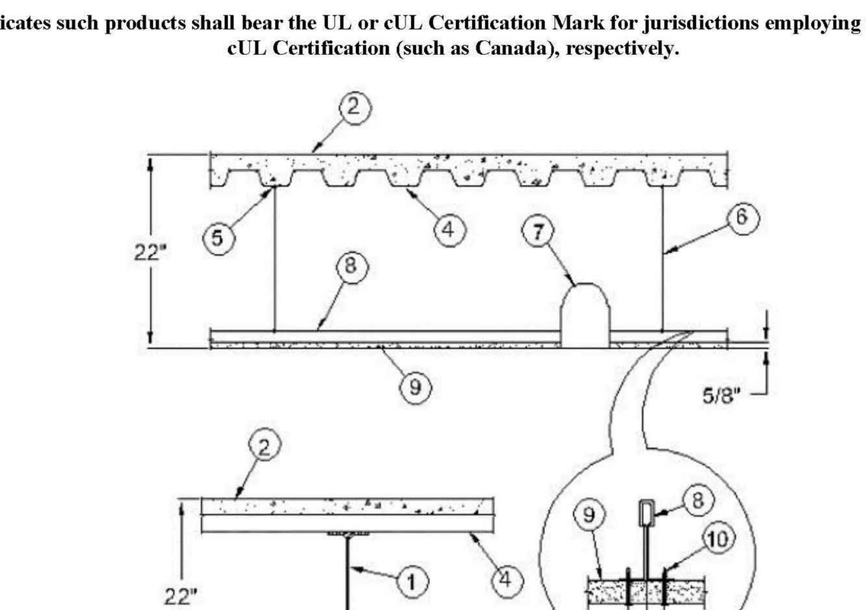
   *Bearing the UL Classification Mark

Design No. D503

April 28, 2014
Restrained Assembly Ratings - 1 or 2 Hr (See Item 2)
Unrestrained Assembly Ratings - 1 or 2 Hr (See Item 2)
Unrestrained Beam Ratings - 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. **Beam** — W12x19, min size.
2. **Normal Weight Concrete** — Normal weight concrete, carbonate or siliceous aggregate, 152 ± 3 pcf unit weight, 4000 psi compressive strength. Concrete thickness above top of steel floor units min. 2 in. for 1 hr assembly ratings and 2 hr unrestrained beam rating and 2-1/2 in. for 2 hr assembly ratings.
3. **Steel Fiber Reinforcement*** — (Not Shown) — Steel fibers added to concrete mix to control shrinkage cracks in concrete. See Fiber Reinforcement (CBXQ) Category for rate that fibers are added to concrete mix.
4. **Steel Floor Units*** — Min. 2 in. deep, min. 20-gauge galv fluted steel floor units welded to supports. Welds spaced 12 in. OC. Supports spaced max. 10 ft OC. See Steel Floor and Form Units (CHWX) Category for names of manufactures.
5. **Hanger Tab** — No. 18 GSG galv steel, 2 in. wide by 3-1/2 in. long, hooked at one end for attachment over male side joint of floor units; other end provided with hole for attachment of hanger wire. Spaced along side joints of floor units as required for hanger wire locations.
6. **Hanger Wire** — No. 12 SWG galv steel wire. Hanger wires spaced not over 48 in. O.C. along main runners and located at ends of main runners at walls.

7. **Recessed Luminaires Classified for Fire Resistance*** — Recessed incandescent luminaires having nominal 6 in diam. Spacing of luminaires not to exceed one luminiaire per 25 sq ft of ceiling area with a min separation of 3 ft between luminaires. Luminaires installed in accordance with accompanying instructions. Wired in conformance with the National Electrical Code. See **Luminaires Classified for Fire Resistance** (CDHW) Category for names of manufactures.

8. **Steel Framing Members*** — Main runners nom 12 ft long spaced 48 in. OC. Cross tees nom 4 ft long installed perpendicular to main runners and spaced 24 in. OC. Additional cross tees located 8 in. from and on both sides of each wallboard end joint.

CHICAGO METALLIC CORP — Type 650, 650C, 670, 670C

8A. **Steel Framing Members*** — As an alternate to Item 8. 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.
   b. **Cross Tees** — Nom 4 ft. long, 1-1/2 in. wide face, installed perpendicular to the main runners, spaced 24 in. OC. Additional cross tees or cross channels used at 8 in. from each side of butted wallboard 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 ft. long installed perpendicular to main runners spaced 24 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 wallboard.

   CGC INC — Type DGL or RX.
   USG INTERIORS LLC — Type DGL or RX.

8B. **Steel Framing Members*** — (Not Shown) — As an alternate to Items 8 and 8A - Main runners nom 12 ft long, spaced 72 in. OC. Cross tees, nom 6 ft long, installed perpendicular to main runners and spaced 24 in. OC. Additional 6 ft long cross tees required at each gypsum board end joint with butted gypsum board end joints centered between cross tees spaced 8 in. OC. The main runners and cross tees may be riveted or screw attached to the wall angle or channel to facilitate the ceiling installation.

USG INTERIORS LLC — Type DGL or RX

9. **Gypsum Board*** — 5/8 in. thick, 4 ft wide, installed with long dimension perpendicular to cross tees with side joints centered along main runners. Wallboard fastened to each cross tee with five wallboard screws with one screw located at the mid-span of the cross tee, one screw located 12 in. from and on each side of the cross tee mid-span, and one screw located 1-1/2 in. from each wallboard side joint. Except at wallboard end joints, wallboard screws shall be located on alternating sides of cross tee flange.

At wallboard end joints, wallboard screws shall be located 1/2 in. from the joint. Wallboard fastened to main runners with wallboard screws, 1/2 in. from side joints midway between intersections with cross tees (24 in. OC) End joints of adjacent wallboard sheets shall be staggered not less than 4 ft OC. Wallboard sheets screw-attached to leg of wall angle with wallboard screws spaced 12 in. OC.

When alternate **Steel Framing Members*** (Item 8B) are used, gypsum board sheets installed with long dimension (side joints) perpendicular to the 6 ft long cross tees with the end joints staggered min 4 ft and centered between cross tees which are spaced 8 in. OC. Gypsum board side joints may occur beneath or between main runners. Prior to installation of the gypsum board sheets, backer strips consisting of nom 7-3/4 in. wide pieces of gypsum board are to be laid atop the cross tee flanges and

centered over each butted end joint location. The backer strips are to be secured to the flanges of the cross tees at opposite corners of the backer strip with hold down clips to prevent the backer strips from being uplifted during screw-attachment of the gypsum board sheets. Gypsum board fastened to cross tees with 1 in. drywall screws spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board. The butted end joints are to be secured to the backer strip with No. 10 by 1-1/2 in. long Type G laminating screws located 1 in. from each side of the butted end joint and spaced 1 in. and 4 in. from the side joints and max 8 in. OC in the field of the board.

CGC INC — Type C
UNITED STATES GYPSUM CO — Type C
USG MEXICO S A DE C V — Type C

10. **Screw, Wallboard** — Type S-12, 1 in. long, self-drilling and self-tapping, 0.163 in. thread diam, 5/16 in. diam heads.
11. **Finishing System** — (Not Shown) — Paper tape embedded in compound over joints and covered with additional compound. Exposed screw heads covered with compound. Edges of compound feathered out.
12. **Wall Angle** — (Not Shown) — No. 26 MSG angle with 1-1/8 in. legs, nailed to the walls along perimeter of ceiling to support steel framing member ends and for screw-attachment of the gypsum wallboard.

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

Design No. G701

October 17, 2017

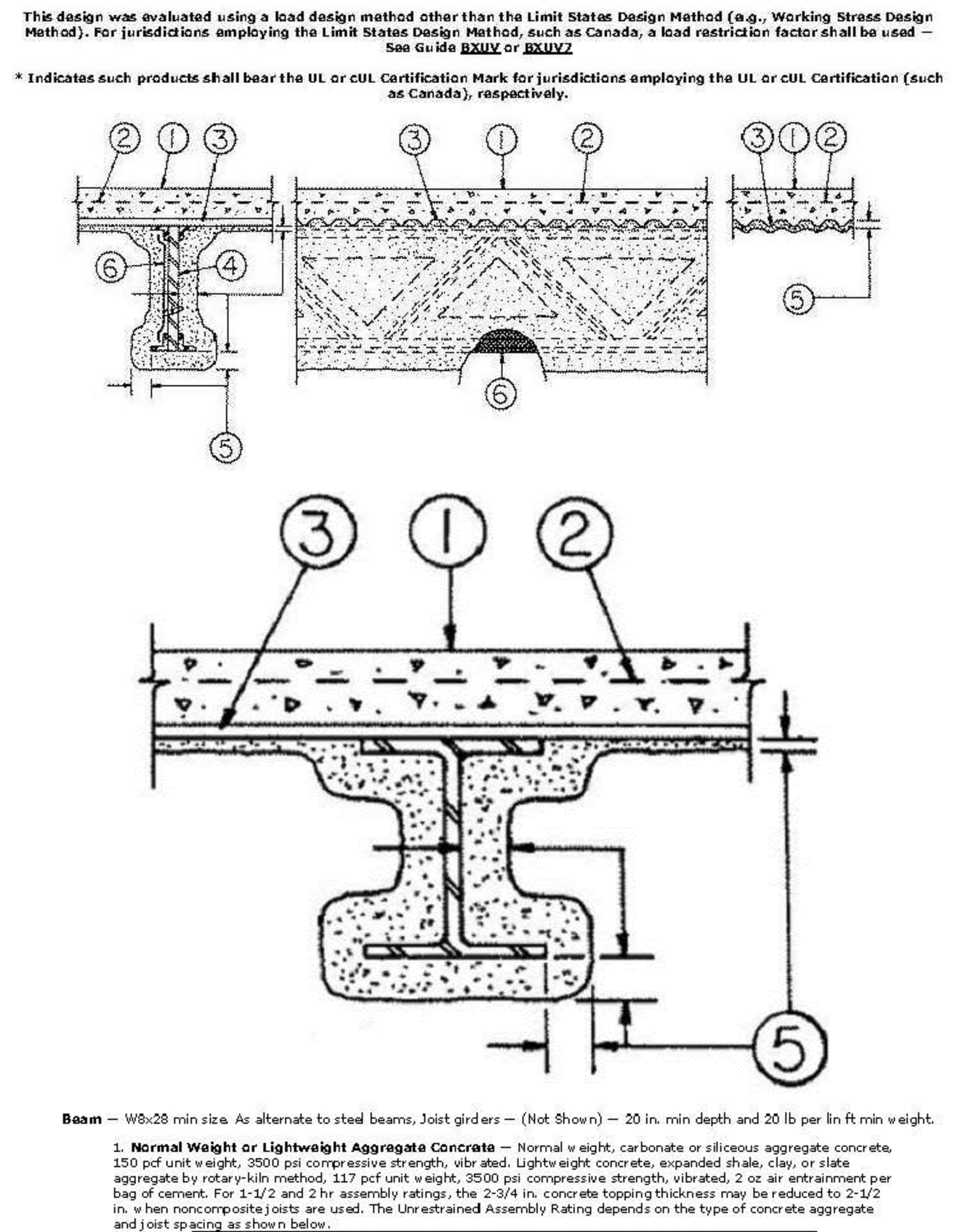
Restrained Assembly Ratings — 1, 1-1/2, 2 or 3 Hr (See Items 4, 4A, 5).

Unrestrained Assembly Ratings — 1, 1-1/2, or 2 Hr (See Items 1, 5).

Unrestrained Beam Ratings — 1, 1-1/2, 2 or 3 Hr (See Item 5).

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.**



Beam — W8x28 min size. As alternate to steel beams, Joist girders — (Not Shown) — 20 in. min depth and 20 lb per lin ft min weight.

1. **Normal Weight or Lightweight Aggregate Concrete** — Normal weight, carbonate or siliceous aggregate concrete, 150 pcf unit weight, 3500 psi compressive strength, vibrated. Lightweight concrete, expanded shale, clay, or slate aggregate by rotary-kiln method, 117 pcf unit weight, 3500 psi compressive strength, vibrated, 2 oz air entrainment per bag of cement. For 1-1/2 and 2 hr assembly ratings, the 2-3/4 in. concrete topping thickness may be reduced to 2-1/2 in. when noncomposite joists are used. The Unrestrained Assembly Rating depends on the type of concrete aggregate and joist spacing as shown below.

	Unrestrained Assembly Rating Hr	
	Max Joist Spacing 3 Ft 6 In.	Joist Spacing Greater Than 3 Ft 6 In. OC
Lightweight aggregate	1-1/2 Hr.	1-1/2 Hr.
Normal Weight aggregate	2 Hr.	1-1/2 Hr.

2. **Welded Wire Fabric** — 6x6 — 8/8 SWG.

3. **Steel Form Units** — No. 28 MSG galv corrugated sheet steel min, 2-1/2 in. pitch and 1/2 in. depth of corrugations. Units welded to each joist, 36 welds per 100 sq ft of form units, with at least one weld at each joint.

Any manufacturer — Corrugated deck having a cross-section similar to above illustration.

4. **Steel Joists** — Min. 16K6 or heavier with min. 3/4 in. diam or larger cross sectional area for web members. As an alternate, any LH-Series steel joists spanning no greater than 60 ft may be used. For spans greater than 60 ft., LH-Series joists may be used provided that the deflection under their published total load shall not be greater than 1/277 of the joist span.

4A. **Horizontal Bridging** — (not shown) — Min 1-1/4x1-1/4x1/8 in. thick steel angles for use with noncomposite joists (Item 4). Number and spacing per Steel Joist Institute specifications. Welded to top and bottom chord of the joists. Min thickness of Spray-Applied Fire Resistive Materials on bridging angles is 1-1/2 in.

4B. **Composite Joists** — (Not Shown) — As an alternate to Items 4 and 4A, steel joists designed for full composite action with the concrete slab. Min. overall depth 13 in. Min area of joist members shall be 0.708 sq in. for top and bottom chord angles and 0.442 sq in. for web. Designed in accordance with SJI Specifications for K-Series joists as revised to November 15, 1989.

4C. **Structural Steel Members*** — (Not Shown) — As an alternate to 4, 4A and 4B — (Not Shown) — Composite joists with top chord embedded in concrete slab. Welded to end supports. Min area of joist members shall be 0.708 sq in. for top and bottom chord angles and 0.442 sq in. for web.

VESCOM STRUCTURAL SYSTEMS INC — Type V.

5. **Spray-Applied Fire Resistive Materials*** — Applied by mixing with water and spraying in more than one coat to a final thickness as shown below to steel surfaces which must be free of dirt, loose scale and oil. Min avg and min ind density of 15/14 pcf respectively. Min avg and min ind density of 19/18 pcf respectively for Type 7GP and 7HD. For method of density determination, see Design Information Section, sprayed materials.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Spray Applied Fire Resistive Mtl Thkns In.		
			Deck	Beam	Joist
1	1	1	1/2	7/16	1-1/2
1-1/2	1	1	1/2	7/16	1-1/2
1-1/2	1-1/2	1-1/2	1/2	3/4	1-1/2
2	1	1	1/2	7/16	1-1/2
2	1-1/2	1-1/2	1/2	3/4	1-1/2
2	2	2	1/2	1	1-1/2
3	1-1/2	1-1/2	1/2	3/4	1-1/2
3	2	2	1/2	1	1-1/2
3	2	3	1/2	1-5/16	—

GCP KOREA INC — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6s, Monokote Acoustic 1 .

PYROK INC — Type LD.

SOUTHWEST FIREPROOFING PRODUCTS CO — Types 4, 5, 5EF, 5GP, 5MD, 7GP, 7HD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD.

GCP APPLIED TECHNOLOGIES INC — Types MK-4, MK-6/HY, MK-6s, Monokote Acoustic 1, RG.

5A. **Alternate Spray-Applied Fire Resistive Materials*** — Applied by mixing with water and spraying in more than one coat to a final thickness as shown below to steel surfaces which must be free of dirt, loose scale and oil. Min avg and min ind density of 22/19 pcf, respectively. For method of density determination see Design Information Section, sprayed materials.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Min Spray Applied Fire Resistive Mtl Thkns In.		
			Deck	Beam	Joist
1	1	1	5/8	7/16	1-1/2
1-1/2	1	1	5/8	7/16	1-1/2
1-1/2	1-1/2	1-1/2	5/8	3/4	1-1/2
2	1	1	5/8	7/16	1-1/2
2	1-1/2	1-1/2	5/8	3/4	1-9/16
2	2	2	5/8	1	1-9/16
3	1-1/2	1-1/2	15/16	3/4	1-9/16
3	2	2	15/16	1	1-9/16
3	2	3	15/16	1-5/16	—

GCP KOREA INC — Types Monokote Acoustic 5 , Z-106, Z-106/G, Z-106/HY.

GCP APPLIED TECHNOLOGIES INC — Types Monokote Acoustic 5 , Z-106, Z-106/G, Z-106/HY.

6. **Metal Lath** — (Optional) — Metal lath may be used to facilitate the spray application of Spray-Applied Fire Resistive Materials on steel bar joists and trusses. The diamond mesh, 3/8 in. expanded steel lath, 1.7 to 3.4 lb/sq yd is secured to one side of each steel joist with No. 18 SWG galv steel wire at joist web and bottom chord members, spaced 15 in. OC max. When used, the metal lath is to be fully covered with Spray-Applied Fire Resistive Materials with no min thickness requirements.

6A. **Nonmetallic fabric mesh** — (Optional, not shown) — As an alternate to metal lath, glass fiber mesh, weighing approximately 2.5 oz/sq yd, polypropylene fabric mesh, weighing approximately 1.25 oz/sq yd or equivalent, may be used to facilitate the spray application. The mesh is secured to one side of each joist web member. The method of attaching the mesh must be sufficient to hold the mesh and the spray-applied resistive material in place during application until it has cured. An acceptable method to attach the mesh is by embedding the mesh in minimum 1/4 in. long beads of hot melted glue. The beads of glue shall be spaced a maximum of 12 in. O.C. along the top chord of the bar joist. Another method to secure the mesh is by 1-1/4 in. long by 1/2 in. wide hairpin clips formed from No. 18 SWG or heavier steel wire.

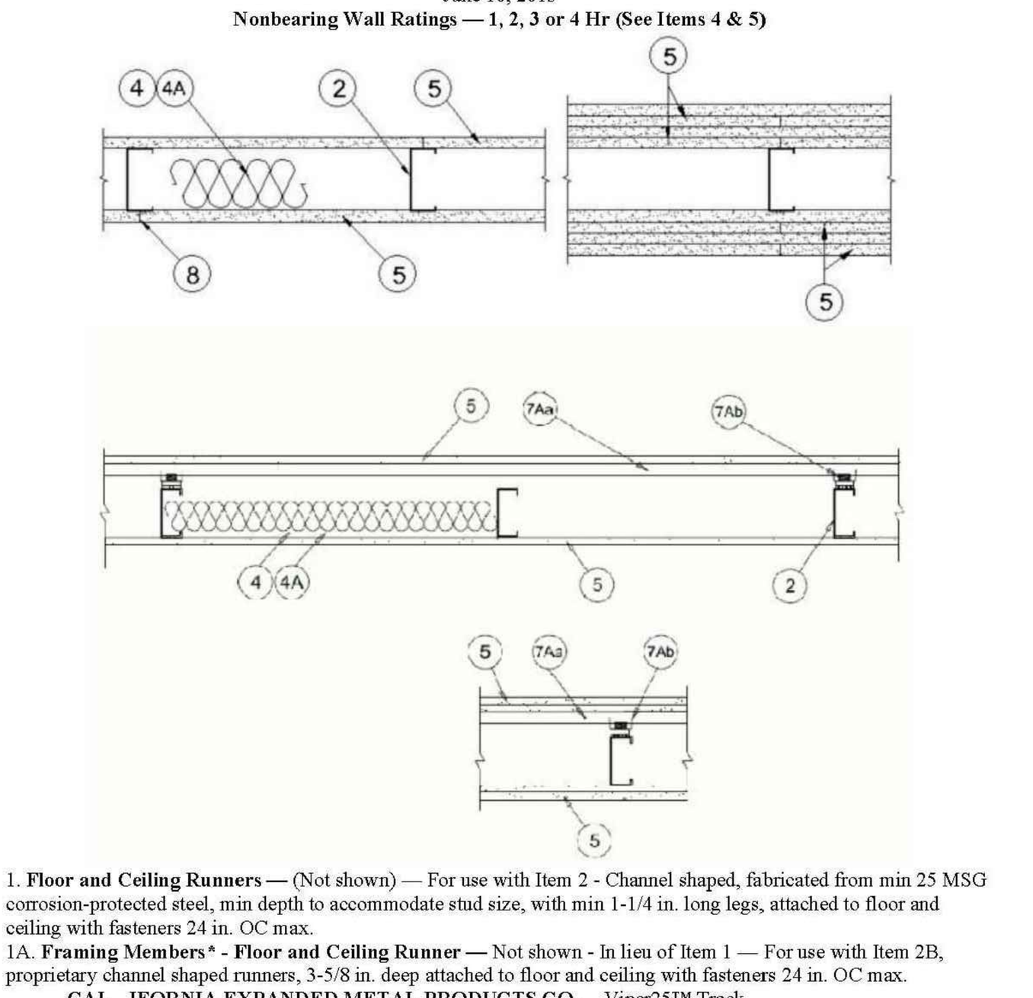
7. **Metal Lath** — (Not Shown) — Where Type 7HD is applied to steel deck, 3/8 in. metal ribbed lath weighing 3.4 lb/yd^2 shall be secured to the underside of the steel deck (ribs upward) with S-12 by 3/8 in. long pan head, self-tapping steel screws spaced 12 in. OC in all directions. Steel screws shall be fitted with 1/2 in. diameter steel washers. Adjacent pieces of lath shall be overlapped 1 in. min.

*** 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 2017-10-17

Fire-resistance Ratings - ANSI/UL 263

Design No. U419
June 10, 2013
Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr (See Items 4 & 5)



1. **Floor and Ceiling Runners** — (Not shown) — For use with Item 2 - Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.
1A. **Framing Members* - Floor and Ceiling Runner** — Not shown - In lieu of Item 1 — For use with Item 2B, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.
   CAL IFORNIA EXPANDED METAL PRODUCTS CO — Viper25™ Track
   CRACO MFG INC — SmartTrack™
   MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™ Track
   PHILLIPS MFG CO L L C — Viper25™ Track

1B. **Framing Members* - Floor and Ceiling Runner** — Not shown - In lieu of Item 1 — For use with Item 2C, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.020 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
   PHILLIPS MFG CO L L C — Viper20™ Track

1C. **Framing Members*— Floor and Ceiling Runners** — (Not shown) — In lieu of Item 1 - Channel shaped, attached to floor and ceiling with fasteners 24 in. OC max.
   ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME Framing System
   CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME Framing System
   QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System
   SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME Framing System
   STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System
   UNITED METAL PRODUCTS INC — Type SUPREME Framing System

1D. **Floor and Ceiling Runners** — (Not shown)—For use with Item 2A- Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners spaced max 24 in. OC.
1E. **Framing Members*— Floor and Ceiling Runners** — (Not shown, As an alternate to Item 1) — For use with Items 2E, 5F or 5G or 5I only, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.
   CLARKDIETRICH BUILDING SYSTEMS — CD ProTRAK
   DMFCWBS L L C — ProTRAK
   MBA BUILDING SUPPLIES — ProTRAK
   RAM SALES L L C — Ram ProTRAK
   SOUTHEASTERN STUD & COMPONENTS INC — ProTRAK
   STEEL STRUCTURAL SYSTEMS L L C — Tri-S ProTRAK

1F. **Framing Members* - Floor and Ceiling Runner** — Not shown - In lieu of Item 1 — For use with Item 2F, proprietary channel shaped runners, minimum width to accommodate stud size, with 1- 1/8 in. long legs fabricated from min 0.015 in. (min bare metal thickness) galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
   SUPER STUD BUILDING PRODUCTS — The Edge

1G. **Framing Members* - Floor and Ceiling Runner** — For use with Item 2G, proprietary channel shaped runners, minimum width to accommodate stud size attached to floor and ceiling with fasteners 24 in. OC max.
   STUDCO BUILDING SYSTEMS — CROCSTUD Track

1H. **Floor and Ceiling Runners** — (Not shown) — Channel shaped, fabricated from min 0.02 in. galv steel, min width to accommodate stud size, with min 1 in. long legs, for use with studs specified below and fabricated from min 0.02 in. galv steel or thicker, attached to floor and ceiling with fasteners spaced max 24 in. OC.
   MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track VT100.

1I. **Framing Members*— Floor and Ceiling Runners** — (Not shown, As an alternate to Item 1) — For use with Items 2H, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.
   TELLING INDUSTRIES L L C — TRUE-TRACK™

1J. **Framing Members* - Floor and Ceiling Runner** — Not shown - In lieu of Item 1 — For use with Item 2I, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.
   TELLING INDUSTRIES L L C — Viper25™ Track

1K. **Framing Members* - Floor and Ceiling Runner** — Not shown - In lieu of Item 1 — For use with Item 2J, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
   TELLING INDUSTRIES L L C — Viper20™ Track

2. **Steel Studs** — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.
2A. **Steel Studs** — (As an alternate to Item 2, For use with Items 5B, 5E, 5H and 5J) Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min depth, 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.
2B. **Framing Members* - Steel Studs** — (As an alternate to Item 2, For use with Items 5C or 5I) - Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a ½ in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.
   CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper25™
   CRACO MFG INC — SmartStud™
   MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™
   PHILLIPS MFG CO L L C — Viper25™

2C. **Framing Members* - Steel Studs** — Not shown - In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.020 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.
   CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper20™
   MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™
   PHILLIPS MFG CO L L C — Viper20™

2D. **Framing Members*— Steel Studs** — In lieu of Item 2 - Channel shaped studs, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
   ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME Framing System
   CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME Framing System
   QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System
   SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME Framing System
   STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System
   UNITED METAL PRODUCTS INC — Type SUPREME Framing System

2E. **Framing Members*— Steel Studs** — (Not shown, As an alternate to Item 2) —For use with Items 5F or 5G or 5I only, channel shaped studs, min depth as indicated under Item 5F, 5G or 5I, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
   CLARKDIETRICH BUILDING SYSTEMS — CD ProSTUD
   DMFCWBS L L C — ProSTUD
   MBA BUILDING SUPPLIES — ProSTUD
   RAM SALES L L C — Ram ProSTUD
   SOUTHEASTERN STUD & COMPONENTS INC — ProSTUD
   STEEL STRUCTURAL SYSTEMS L L C — Tri-S ProSTUD

2F. **Framing Members* - Steel Studs** — Not shown - In lieu of Item 2 — proprietary channel shaped steel studs, minimum width indicated under Item 5, 1-1/4 in. deep fabricated from min 0.015 in. (min bare metal thickness) galvanized steel. Studs 3/8 in. to 3/4 in. less in lengths than assembly heights.
   SUPER STUD BUILDING PRODUCTS — The Edge

2G. **Framing Members* - Steel Studs** — Not shown - In lieu of Item 2 - proprietary channel shaped studs, minimum width indicated under Item 5, Studs to be cut 3/8 to 3/4 in. less than the assembly height.
   STUDCO BUILDING SYSTEMS — CROCSTUD

2H. **Framing Members*— Steel Studs** — (Not shown, As an alternate to Item 2) — Fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
   TELLING INDUSTRIES L L C — TRUE-STUD™

2I. **Framing Members* - Steel Studs** — (As an alternate to Item 2, For use with Items 5C or 5L) - Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a ½ in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.
   TELLING INDUSTRIES L L C — Viper25™

2J. **Framing Members* - Metal Studs** — Not shown - In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.020 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights
   TELLING INDUSTRIES L L C — Viper20™

3. **Wood Structural Panel Sheathing** — (Optional, For use with Item 5 Only.)- (Not Shown) - 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, fastener lengths for gypsum panels increased by min. 1/2 in.
4. **Batts and Blankets*** — (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified companies.
4A. **Batts and Blankets*** — (Optional) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified companies.
5. **Gypsum Board*** — Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each S ide of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2C, 2D, 2F and 2G	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	1 layer, 5/8 in. thick	Optional
1	2-1/2	1 layer, 1/2 in. thick	1-1/2 in.
1	1-5/8	1 layer, 3/4 in. thick	Optional
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
2	3-1/2	1 layer, 3/4 in. thick	3 in.
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	2 layers, 3/4 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional
4	2-1/2	2 layers, 3/4 in. thick	2 in.

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX or WRC; 3/4 in. thick Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SGX, SHX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR ; 3/4 in. thick Types IP-X3 or ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Types IP-X3 or ULTRACODE

When Item 7B, Steel Framing Members*, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) shall be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in Item 6.

5A. **Gypsum Board*** — (As an alternate to Item 5) — 5/8 in. thick, 24 to 54 in. wide, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 6.
   CGC INC — Type SHX.
   UNITED STATES GYPSUM CO — Type FRX-G, SHX.
   USG MEXICO S A DE C V — Type SHX.

5B. **Gypsum Board*** — (Not Shown) - As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 in or ¾ in. thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 in. or ¾ in. may be used as alternate to all 5/8 in. or ¾ in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or ¾ 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 20 MSG steel studs Item 2A 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 11) or Lead Discs or Tabs (see Item 12).
   RAY-BAR ENGINEERING CORP — Type RB-LBG

5C. **Gypsum Board*** — (For Use With Item 2B) Rating Limited to 1 Hour. 5/8 in. thick, 48 in. wide, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. (Vertical Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. Vertical joints are to be centered over studs and staggered one stud cavity on opposite sides of studs. (Horizontal Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. All horizontal joints are to be backed as outlined under section VI of Volume 1 in the Fire Resistive Directory.
   CGC INC — Type SCX.
   UNITED STATES GYPSUM CO — Type SCX, SGX.
   USG MEXICO S A DE C V — Type SCX.

5D. **Gypsum Board*** — (As an alternate to Item 5) — 5/8 in. thick, 48 in. wide, applied vertically or horizontally. Secured as described in Item 6. For use with Items 1 and 2 only.
   UNITED STATES GYPSUM CO — Type USGX.

5E. **Gypsum Board*** — (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nominal 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 (or No. 6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.
   NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Nelco

5F. **Gypsum Board*** — (As an alternate to Item 5) — For use with Items 1E and 2E and limited to 1 Hour Rating only, Gypsum panels with beveled, square or tapered edges, applied vertically, and fastened to the steel studs with 1 in. long Type S screws spaced 8 in. OC along vertical and bottom edges and 12 in. OC in the field. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Steel stud depth shall be a minimum 3-5/8 in.
   UNITED STATES GYPSUM CO — 5/8 in. thick Type SCX, SGX.

5G. **Gypsum Board*** — (As an alternate to Item 5) — For use with Items 1E and 2E only, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally, as specified in the table below and fastened to the steel studs as described in Item 6. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Item 2E	No. of Layers & Thickness of Panel	Min Thkns of Insulation (Item 4)
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR;, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE
UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type SCX, SGX, SHX, IP-X1, AR, C, , FRX-G, IP-AR, IP-X2, IPC-AR ; 3/4 in. thick Types IP-X3 or ULTRACODE
USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE

5H. **Gypsum Board*** — (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 or 3/4 in thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 in. or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel 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 spaced 8 in. OC at perimeter and 12 in. OC in the field. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 11A) or Lead Discs (see Item 12A).
   MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

5I. **Gypsum Board*** — (As an alternate to Item 5) - Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges installed as described in Item 5. Steel stud minimum depth shall be as indicated in Item 5.
   CGC INC — Type ULX
   UNITED STATES GYPSUM CO — Type ULX
   USG MEXICO S A DE C V — Type ULX

5J. **Gypsum Board*** — (Not Shown) - (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). 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

6. **Fasteners** — (Not shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). **Single layer systems:** 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. **Two layer systems:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 and 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer.**Three-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. **Four-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.
7. **Furring Channels** — (Optional, not shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Item 5A and 5E.
7A. **Framing Members*** — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
   a. **Furring Channels** — Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.
   b. **Steel Framing Members*** — Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.
   PAC INTERNATIONAL INC — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75).

7B. **Framing Members*** — (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:
   a. **Furring Channels** — Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 5. Not for use with Item 5A and 5E.

   b. **Steel Framing Members*** — Used to attach furring channels (Item 7Ba) to one side of studs (Item 2) only. Clips spaced 48 in. OC., and secured to studs with two No. 8 x 2-1/2 in. coarse drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips.
   KINETICS NOISE CONTROL INC — Type Isomax

7C. **Framing Members*** — Optional - Not Shown - Used as an alternate method to attach resilient channels (Item 7). Clips attached at each intersection of the resilient channel and the steel studs (Item 2). Resilient channels are friction fitted into clips, and then clips are secured to the steel stud with min. 1 in. long Type S-12 steel screws through the center hole of the clip and the resilient channel flange.
   KEENE BUILDING PRODUCTS CO INC — Type RC Assurance.

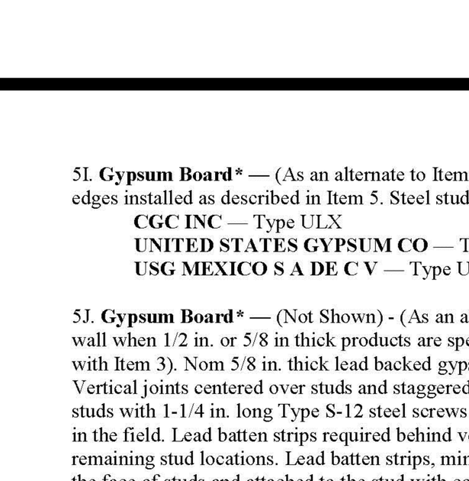
7D. **Framing Members*** — (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
   a. **Furring Channels** — Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.
   b. **Steel Framing Members*** — Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.
   PLITEQ INC — Type GENIECLIP

7E. **Steel Framing Members** — (Optional, Not Shown)* - Furring channels and resilient sound isolation clip as described below:
   a. **Furring Channels** — Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured together with four self-tapping No. 8x1/2 Self Drilling screws (2 per side 1 in. and 4 in. from overlap edge). Gypsum board attached to furring channels as described in Item 4. Side joint furring channels shall be attached to studs with RESILMOUNT Sound Isolation Clips - Type A237R located approximately 2 in. from each end of length of channel. Both Gypsum Boards at side joints fastened into channel with screws spaced 8 in. OC, approximately 1/2 in. from joint edge. Not for use with Item 5A and 5E.
   b. **Steel Framing Members*** — Resilient sound isolation clip used to attach furring channels (Item 7Ea) to studs. Clips spaced 24 in. OC., and secured to studs with No. 10 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
   STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237R

8. **Joint Tape and Compound** — Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.
9. **Siding, Brick or Stucco** — (Optional, not shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.
10. **Caulking and Sealants*** — (Optional, not shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.
   UNITED STATES GYPSUM CO — Type AS

11. **Lead Batten Strips** — (Not Shown, For Use With Item 5B) - 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 wallboard (Item 5B) and optional at remaining stud locations. Required behind vertical joints.
11A. **Lead Batten Strips** — (Not Shown, For Use With Item 5H) 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 99.9% meeting the Federal specification QQ-L-201f, Grades "A, B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.
12. **Lead Discs or Tabs** — (Not Shown, For Use With Item 5B) - Used in lieu of or in addition to the lead batten strips (Item 11) 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 5B) 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".
12A. **Lead Discs** — (Not Shown, for use with Item 5H) Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.9% meeting the Federal Specification QQ-L-201f, Grades "A, B, C or D".
13. **Lead Batten Strips** — (Not Shown, For Use With Item 5E) Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 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 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5E) and optional at remaining stud locations.
14. **Lead Tabs** — (Not Shown, For Use With Item 5E) 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5E) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.
   *Bearing the UL Classification Mark



Life Storage #230
Self Storage Phase II

1639 Route 22
Brewster, NY 10509

STINARD ARCHITECTURE INC
CARTERSVILLE GA 30120
217 S. ERWIN STREET
770.425.7400 (F) 770.425.7400
STINARDARCH.COM

ISSUE: FOR CONSTRUCTION
REVISIONS:

PROJECT NUMBER 201941
DATE 6-5-20

SHEET NUMBER
A0.2