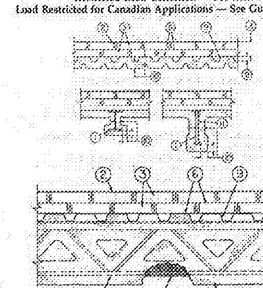
Design No. P717 JUNE 15, 2018

Restrained Assembly Rating — 1, 1-1/2 or 2 H (See Items 3, 4 and 10)
Unrestrained Assembly Rating — 1, 1-1/2 or 2 H (See Items 3, 4 and 10)
Unrestrained Beam Rating — 1, 1-1/2 or 2 H (See Item 10)
Restricted Load Condition — See Item 1
Load Restricted for Canadian Applications — See Guide BXUV7



1. Beam — W8x16 min size, or Steel Joist — 10H4, 14J7, 12K3 or 16K3 min sizes. (See Items 10 and 10A).
   NOTE: Design load shall stress H-Series joists to a max tensile stress of 22 KSI.
2. Roof Covering* — Consisting of hot mopped or cold application bituminous materials compatible with the insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Roof Covering Materials (TEVT).
2A. In lieu of Item 2, 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 Membrane (CHCI).
2B. Metal Roof Deck Panels* — (Not Shown) — In addition to or in lieu of Items 2 or 2A, the roof covering may consist of a mechanically fastened metal roof deck panel assembly. See Fire Resistance Directory — Metal Roof Deck Panels (CETW).
3. Roof Insulation — Foamed Plastic* — Polyisocyanurate foamed plastic insulation boards nom 48 by 48 or 96 in., to be applied in one or more layers. Min thickness is 1.3 in. for the 1 h rating without gypsum wallboard (Item 4), and for the 1-1/2 and 2 h ratings with gypsum wallboard and 2.6 in. for the 1-1/2 h ratings without gypsum wallboard. (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 —ACFoam II, ACFoam III, ACFoam IV.
   CARLISLE SYNTEC INCORPORATED —Types HP, HP-H, HP-N, HP-W.
   THE DOW CHEMICAL CO —Types Hy-Therm AP, Hy-Therm Tapered.
   DYPLAST PRODUCTS L L C
   FIRESTONE BUILDING PRODUCTS CO L L C — "ISO 95+GL", "ISO 300".
   GAF MATERIALS CORP —Isotherm R.
   HUNTER PANELS —H Shield.
   JOHNS MANVILLE — ENRGY 3, ISO-1, PSI 25.
   LOADMASTER SYSTEMS INC —Loadmaster Polyisocyanurate Insulation.
   RMAX OPERATING L L C —Multi-Max-3, Multi-Max FA-3, Ultra-Max, Tapered Thermaroof-3, Tapered Thermaroof FA-3, Ultra-Max Tapered.
   DOW ROOFING SYSTEMS L L C —"Stevens ISO 2000", "Stevens ISO 3000".
   GENFLEX ROOFING SYSTEMS L L C — "GenFlex ISO"
3A. Foamed Plastic*, — 1 to 8 in. thick, density of 2.5 pcf max, polystyrene foamed plastic insulation boards secured to the gypsum wallboard (Item 4) with asphalt glaze coat or adhesive. (Note: Adhesive* (Item 6) and/or asphalt glazer coat may be omitted when Item 2A is used). See Foamed Plastic (BRYX) category in the Building Materials Directory or Foamed Plastic (CCVW) category in the Fire Resistance Directory for names of manufacturers.
3B. Mineral and Fiber Boards* — (Not Shown) — Optional — Applied in one or more layers over the Foamed Plastic (Item 3). To be applied with adhesive (Item 6), asphalt or coal tar pitch (Item 7) or mechanical fasteners (Item 8).
   OWENS CORNING HT INC, DIV OF OWENS CORNING
   SIPLAST INC
3C. Building Units* — As an alternate to Item 3, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with oriented strand board. Min thickness of the polyisocyanurate core is 1.3 in. for the 1 hr rating without gypsum wallboard (Item 4) and for the 1, 1-1/2 and 2 hr ratings with gypsum wallboard and 2.6 for the 1-1/2 hr ratings without gypsum wallboard. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.
   ATLAS ROOFING CORP —ACFoam NailBase Insulation, Vented R
   FIRESTONE BUILDING PRODUCTS CO L L C —Hailgard.
   JOHNS MANVILLE —Nailboard.
3D. Roof Insulation — Foamed Plastic* — Polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., to be applied in one or more layers over gypsum wallboard (Item 4). Min thickness is 3 in. 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.
   RMAX OPERATING L L C
3E. Building Units* — Polyisocyanurate foamed plastic insulation boards faced on the underside (or both sides) with mineral fiber board. Min thickness of the polyisocyanurate core is 1.3 in. for the 1 hr rating without gypsum wallboard (Item 4) and for the 1-1/2 and 2 hr ratings with wallboard and 2.6 in. for the 1-1/2 hr ratings without gypsum wallboard. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. adjacent rows. Adhesive (Item 6) may be applied between the building units and the vapor retarder (or gypsum wallboard if vapor retarder is not used).
   FIRESTONE BUILDING PRODUCTS CO L L C —"ISO 95+ Composite".
   JOHNS MANVILLE —Fesco Foam.
3F. Building Units* — As an alternate to Items 3 through 3G, polyisocyanurate foamed plastic insulation boards faced on the underside with wood fiber board. Min thickness of the polyisocyanurate core is 1.3 in. for the 1 hr rating without gypsum wallboard (Item 4) and for the 1-1/2 and 2 hr ratings with wallboard and 2.6 in. for the 1-1/2 hr ratings without gypsum wallboard. No limit on max overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows.
   FIRESTONE BUILDING PRODUCTS CO L L C —"ISO 95+ Wood Fiberboard Composite".
   JOHNS MANVILLE —ENRGY-2 Plus.
3G. Building Units* — As an alternate to Items 2 and 3 through 3H, insulated steel panels, 36 in. wide, installed over gypsum wallboard (Item 4). Building units mechanically fastened to the steel deck (through the gypsum wallboard) in accordance with the manufacturer's recommendations.
   CENTRIA —Types VP-1.75, VP-2.5, VP-4.0.
3H. Building Units* — Not Shown — As an alternate to Items 3 through 3I, composite polyisocyanurate foamed plastic insulation board, nom 48 by 48 or 96 in., with an adhered nailing surface may be used with the following limitations. These composite building units have ventilation slots internal to the panels. The thickness of the panel depends upon the thinnest portion of the polyisocyanurate insulation. The following dimensions apply to the polyisocyanurate insulation, min 1.3 in. thick for the 1 hr rating without gypsum wallboard applied to the roof deck, min 1.3 in. thick for the 1-1/2 and 2 hr ratings with gypsum wallboard and min 2.6 in. for the 1-1/2 hr rating without gypsum wallboard. There is no limit on the max insulation thickness.
   GAF MATERIALS CORP —Type INSUL-AIR.
   JOHNS MANVILLE —Type ISO-VENT.
3I. Building Units* — As an alternate to Items 3 through 3J, polyisocyanurate foamed plastic insulation boards, nom 48 by 48 or 96 in., faced on the top surface with gypsum board. Min thickness of the polyisocyanurate core is 1.3 in. for 1 hr rating without gypsum wallboard (Item 4) and for the 1-1/2 and 2 hr ratings with wallboard (Item 4) and 2.6 in. for the 1-1/2 hr ratings without gypsum wallboard (Item 4). No limit on overall thickness. Boards to be installed with end joints staggered a min of 6 in. in adjacent rows. Adhesive (Item 6) may be applied between the building units and the vapor retarder (or gypsum wallboard if vapor retarder is not used).
   JOHNS MANVILLE — ENRGY 2 Gypsum Composite.
3J. Roof Insulation — Foamed Plastic* — (Not Shown) — As an alternate to Items 3 through 3I, polystyrene foamed plastic insulation boards, applied in one or more layers over gypsum wallboard. Min. thickness is 1.0 in. with no max overall thickness max density 2.5 pcf. When applied in more than one layer, each layer to be offset in both directions form layer below a min. of 6 in. in order to lap all joints. Boards secured to gypsum wallboard (item 4) with asphalt glaze coat or adhesive (Item 6). Adhesive and/or asphalt glazer coat may be omitted when Item 2A is used. See Foamed Plastic (BRYX) category in the Building Materials Directory or Foamed Plastic (CCVW) category in the Fire Resistance Directory for names of manufacturers.
3K. Mineral and Fiber Boards* — (Not Shown) - Optional - Applied in one or more layers over Foamed Plastic (Item 3) to be applied with adhesive (Item 6), asphalt or coal tar pitch (Item 7) or mechanically fastened (Item 8).
   JOHNS MANVILLE — Fesco, Retrofit, Dura Board
3L. Roof Insulation - Foamed Plastic* — (Not Shown) - Optional, 1/4 in. thick - Placed over minimum 1-1/2 in. thick polyisocyanurate Foamed Plastic (Item 3) to be applied with adhesive (Item 6), asphalt or coal tar pitch (Item 7) or mechanically fastened (Item 8). Boards to be installed with end joints to be offset in both directions from layer below a min of 6 in. in order to lap all joints.
   JOHNS MANVILLE — Invinsa Roof Board
4. Gypsum Board — (Not shown — Classified or Unclassified) — May be used to obtain various Restrained and Unrestrained Assembly Ratings as described in Item 10. Required for the 2 Hr Assembly and Beam Ratings. Also required for 1, 1-1/2 and 2 hr Assembly and Beam Ratings when insulated steel building units are used. Supplied in sheets nom 2 by 4 ft to 4 by 12 ft, by nom 5/8 in. thick. Min weight 2.2 pcf. Applied perpendicular to steel roof deck direction with adhesive (Item 6), hot asphalt (Item 7) or laid loosely. End joints to occur over crests of steel roof and to be staggered 2 ft in adjacent rows. See Gypsum Board (CKNX) category for names of manufacturers.
5. Vapor Retarder — Sheathing Material* — (Optional — Not shown) — Vinyl film or paper scrim vapor barrier, applied to steel roof deck or gypsum wallboard with adhesive (Item 6), hot asphalt (Item 7) or laid loosely, overlapped approx 2 in. on adjacent sheets. See Sheathing Material (CHIZ) category for names of manufacturers.
5A. Sheathing Material* — (Optional) — In lieu of Item 5, a self-adhered rubberized asphalt roofing underlayment membrane which may be placed on top of gypsum wallboard or on the roof insulation.
   CARLISLE COATINGS & WATERPROOFING INC —CCW-707.
   W R GRACE & CO - CONN — Grace Ice and Water Shield, Grace Select, Grace Ultra, and Grace Basic.
6. Adhesive* — (Optional) — The vapor retarder, the gypsum wallboard or the first layer of roof insulation may be secured with adhesive to the steel crest surfaces. Also used to attach the vapor retarder to gypsum wallboard, the first layer of insulation to vapor retarder or gypsum wallboard and each additional layer of insulation. Applied in 1/2 in. wide ribbons 6 in. OC at 0.4 gal per 100 sq ft. See Adhesives (GYWR) category for names of manufacturers.
6A. Adhesive* (Optional) — (Bearing the UL Classification Marking for Roof Systems (TGFU)) - The vapor retarder, the gypsum wallboard or the first layer of roof insulation may be secured with adhesive to the steel crest surfaces. Also used to attach the vapor retarder to gypsum wallboard, the first layer of insulation to vapor retarder or gypsum wallboard and each additional layer of insulation. Applied at a max rate of 19.8 g/ft². When FAST 100 adhesive is used, additional Spray-Applied Fire Resistance Materials* (CHPX) is required on the deck for the 1-1/2 and 2 hr Unrestrained Assembly Ratings. The thickness specified for the deck shall be increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating.
   CARLISLE SYNTEC INCORPORATED — FAST 100
7. Asphalt or Coal Tar Pitch* — (Optional — Not shown) — The vapor retarder, the gypsum wallboard or the first layer of roof insulation may be secured with asphalt or coal tar pitch to the steel crest surfaces at a max rate of 15 lbs per sq ft. Also used to attach the vapor retarder to gypsum wallboard, the first layer of insulation to vapor retarder or gypsum wallboard and each additional layer of roof insulation, applied at a max rate of 25 lbs/100 sq ft.
8. Mechanical Fasteners — (Optional — Not shown) — Mechanical screw-type fasteners with metal or plastic washer designed for the purpose may be used to attach one or more layers of insulation to steel roof deck.
9. Steel Roof Deck — (Unclassified) — Min 1-1/2 in. deep and 30 in. wide galv fluted steel deck. Flutes 6 in. OC with crest width ranging from 3-5/8 to 5-1/16 in. Min gauge is 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports at deck laps at a max of 12 in. OC between sides of units. Side laps of adjacent units welded, button-punched or secured together with No. 12 by 3/4 in. long self-drilling, self-tapping steel screws spaced a max of 36 in. OC; or Classified Steel Floor and Form Units* — Noncomposite 1-1/2 or 3 in. deep, 24, 30 or 36 in. wide galv units - Min gauge is 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports at deck laps at a max of 12 in. OC between sides of units. Side laps of adjacent units welded, button punched or secured together with No. 12 by 3/4 in. long self-drilling, self-tapping steel screws spaced a max of 36 in. OC.
   ASC STEEL DECK, DIV OF ASC PROFILES INC —Type N.
   CANAM STEEL CORP — Type P-3606, P-3615, P-2436, and P-2404.
   CMC JOIST & DECK - MANUFACTURERS OF UNITED STEEL DECK PRODUCTS —Types B, BI, NI and NS. Units may be phos/painted or painted/painted.
   CONSOLIDATED SYSTEMS INC —Types B, BI, F, N, NI. Units may be phos/ptd.
   LOADMASTER SYSTEMS INC —Types PS, SS-150, SS-300. Units may be ptd/ptd.
   MARLYN STEEL DECKS INC —Types B, F, N, NV.
   VERCO DECKING INC - A NUCOR CO — Types PLB, B, PLN or N Formlock. Units may be phos/ptd. Types PLB, HSB, PLN or N Formlok. Units may be ptd/ptd.
   VULCRAFT, DIV OF NUCOR CORP —Galv. or ptd/ptd Types 1.5B, 1.5BI, 1.5F, 3N, 3NI.
   WHEELING-PITTSBURGH STEEL CORP, DIV OF WHEELING CORRUGATING CO —Galv. or phos/ptd Types A, BW, F, High Strength B, High Strength BW, N.
10. Spray-Applied Resistive Materials* — Applied by mixing with water and spraying in more than one coat to final thicknesses as shown in the illustration above and in the table below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Steel deck surface must be "spatter" coated with Types DK, DK2, DK3, SK-III spray-applied resistive material prior to application of spray-applied resistive material. Types DK, DK2, DK3, SK-III spray-applied resistive material applied in accordance with the manufacturer's application instructions. Min avg and min ind density of 15/14 pcf, respectively. Min avg and min ind density of 19/18 pcf respectively for Types 7GP and 7HD. For method of density determination, see Design Information Section. Thickness of the spatter coat is included in the total final thickness of the protection material.

Restrained & Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Spray Applied Fire Resistive Mtl Thk In. on Beam	on 10H4 or 12K3 Joist	on 16J7 Joist
1	1	1-1/8	2	1-1/2
1-1/2	1-1/2	1-1/4	2	—
2+	2+	1-1/4	2-7/16	—

Restrained & Unrestrained Assembly Rating Hr	Spray Applied Fire Resistive Mtl Thk In. On Deck# Without Gypsum Wallboard	With Gypsum Wallboard	With Gypsum Wallboard & Insulated Steel Building Unit (Item 3I)
1	1-13/16	1-3/8	1-13/16
1-1/2	2	1-5/8	2
2	NR	1-7/8	2-3/8

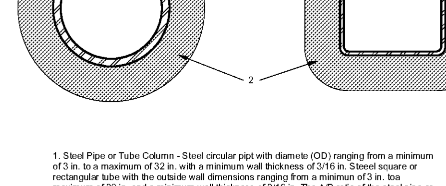
#The required minimum thickness of Spray-Applied Fire Resistive Materials on the steel deck is increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating when Item 6A is used.
NR-Indicates no rating.
+2 Hr. assembly and beam ratings apply only to assembly with gypsum wallboard.
   ARABIAN VERMICULITE INDUSTRIES —Type MK-5.
   W R GRACE & CO - CONN —Types MK-4, MK-5, SK-III.
   PYROK INC —Type LD.
   SOUTHWEST FIREPROOFING PRODUCTS CO —Types 4, 5, 5EF, 5GP, 5MD, 7GP, 7HD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD, DK, DK2, DK3.
10A. Spray-Applied Resistive Materials* — Applied by mixing with water and spraying in more than one coat to final thicknesses as shown in the illustration above and in the table below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Steel deck surface must be "spatter" coated with Type SK-III spray-applied resistive material prior to application of spray-applied resistive material Type SK-III spray-applied resistive material applied in accordance with the manufacturer's application instructions. Min avg and min ind density of 15/14 pcf respectively. For method of density determination, see Design Information Section. Thickness of the spatter coat is included in the total final thickness of the protection material.

Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Spray Applied Fire Resistive Mtl Thickness on Deck With Gypsum Wallboard	on Deck Without Gypsum Wallboard	on Beam	on Min 16K3 Joist
1	1**	1	1/2+	1+++	1/2	1-1/8***
1	1	1	11/16+	1+++	1/2	1-1/8***
1	1	1	3/4****	—	1/2	1-1/8***
1-1/2	1	1	3/4++	1-3/8++++	9/16	1-5/16
1-1/2	1-1/2	1-1/2	1++	1-3/8++++	3/4	1-7/16
1-1/2	1-1/2	1-1/2	1-1/8****	—	3/4	1-7/16
2	1	1	1+++	1-3/2++++	3/4	1-7/16
2	1-1/2	1-1/2	1+++	1-3/2++++	3/4	1-7/16
2	2	2	1-1/4+++	1-11/16++++	1	2-3/16***
2	2	2	1-9/16****	—	3/4	2-3/16***

#The required minimum thickness of Spray-Applied Fire Resistive Materials on the steel deck is increased by 1/16 in. for 1-1/2 hr Unrestrained Assembly Rating and 1/4 in. for 2 hr Unrestrained Assembly Rating when Item 6A is used.
** - The Unrestrained Assembly Rating is 1 hr when the deck span is 62 in. or less.
*** - The joist protection thickness can be reduced to 1-1/8 and 2 in. for the 1 and 2 hr joist ratings when minimum 16K3 joists are used.
**** - Minimum protection thickness when item 3K is used.
+ - Minimum insulation thickness is 1 in.
++ - Minimum insulation thickness is 1-1/2 in.
+++ - Minimum insulation thickness is 2 in.
++++ - Minimum insulation thickness is 3 in. or when item 3B is used.
   W R GRACE & CO - CONN —Types MK-6/HY, MK-6S, RG, SK-III
   GRACE KOREA INC —Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6S, SK-III
11. Non-Metallic Fabric Mesh — (Optional) — As an alternate to metal lath, glass fiber fabric 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 Spray-Applied Fire Resistive Materials 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.
11A. Metal Lath — (Optional, not shown) — 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 steel joist with No. 18 SWG galv steel wire at joist web and bottom chord members, spaced 15 in. O.C. max. When used, the metal lath is to be fully covered with Spray-Applied Fire Resistive Materials with no min thickness requirements.
12. Bridging — (Not shown) — Minimum 1-1/4 by 1-1/4 by 1/8 in. thick steel angles welded to top and bottom chords of each joist. Number and spacing of bridging angles per Steel Joist Institute specification. Bridging coated with the same thickness of Spray-Applied Fire Resistive Materials (Item 10) as the joist.
13. Building Units* — (Optional-Not shown) — Nominal 12 by 18 in., 18 by 24 in. flat or tapered cellular glass blocks or 24 by 48 in. flat or tapered cellular glass boards, applied over the roof insulation (Item 3) with asphalt (or coal tar pitch). Joints to be offset from joints of roof insulation.
   PITTSBURGH CORNING CORP
   *Bearing the UL Classification Mark

UL LISTING P717 — 7

Design No. X771
Ratings - 3/4, 1, 1 -1/2, 2, 3, and 4 h
OCTOBER 26, 2017



1. Steel Pipe or Tube Column - Steel circular pipt with diamete (OD) ranging from a minimum of 3 in. to a maximum of 32 in. with a minimum wall thickness of 3/16 in. Steeel square or rectangular tube with the outside wall dimensions ranging from a minimun of 3 in. toa maximum of 32 in. and a minimum wall thickness of 3/16 in. The A/P ratio of the steel pipe or tube (see Item 2) shall range from 0.18 to 2.0.
Sprap-Applied Fire Resistive Materials*- Applied by mixing with water and spraying in one or more coats to steel surfaces which must be clean and free of dirt, loose scale and oil. Min. avg and ind density of 15/14 pcf respectively. Min avg and min ind density 19/18 pcf respectively for types 7GP and 7HD. For method of density determination, see Design Information Section, preceding these designs. The hourly rating of the structural member is dependent upon the ratio of A/P and the thickness of Spray-Applied Fire Resistive Materials, where A is the cross sectional area of the pipe or tube and P is the heated perimeter. The A/P ratio of a circular pipe is determined by:

A/Ppipe= t(d-t)/d

Where:
d = the outer diameter of the pipe (in.)
t = the wal thicknes of the pipe (in.)
The A/P ratio of a rectangular or square tube is determined by:
t (a + b 2t)
A/P tube = a + b
Where:
a = the outer width of the tube (in.)
b = the outer length of the tube (in.)
t = the wal thicknes of the tube (in.)
The thicknes of Spray-Aplied Fire Resistive Materials for ratings of 3/4, 1, 1-1/2, 2, 3 and 4 h of a steel pipe or tube can be determined by the equation:

h = R - 0.20/4.43 (A/P)

Where:
R = the hourly rating (hrs).
h = the thicknes of SprayAplied Fire Resistive Materials, minimum 1/4 in., maximum 3-7/8 in.

ARABIAN VERMICULITE INDUSTRIES — Types MK6/CBF, MK6/ED, MK6/HY, MK-6s, Sonophone 1, Sonophone 5, Z106, Z106/G.

GRACE KOREA INC — Types MK6/CBF, MK6/ED, MK6/HY, MK-6s, Monokote Acoustic 1, Monokote Acoustic 5, Z106, Z106/G.

PYROK INC — Type LD.

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

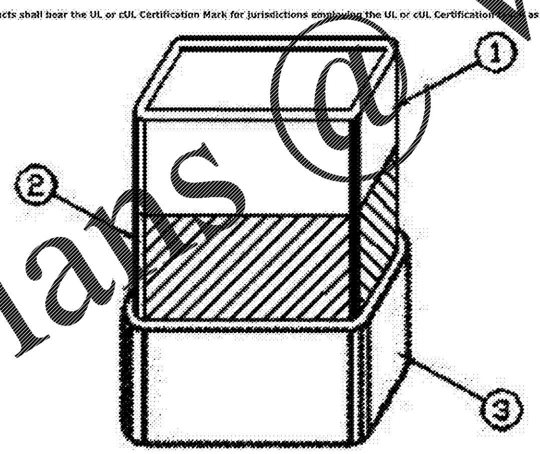
GCP APLIED TECHNOLOGIES INC — Types MK6/HY, MK-6s, Monokote Acoustic 1, Monokote Acoustic 5, RG, Z106, Z106/G.
* Indicates such products shal bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

UL LISTING X771 — 9

Design No. X676
October 20, 2017

Ratings - 1, 1-1/2, 2, and 3 Hr. (See Item 3 and 4)

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



1. **Steel Tube Column** — Hollow structural steel columns with the minimum sizes shown in the tables below. Columns shall be free of dirt, loose scale and oil.

2. **Primer Coating** — Two Component Epoxy or Phenolic Modified Alkyd applied at 0.002 in. dry film thickness.

3. **Mastic & Intumescent Coating*** — Coating spray or brush applied in accordance with the manufacturer's instructions at the minimum average dry thickness shown in the table below. The thickness shown does not include primer thickness.

Size	A/P	1 Hr. In.	1-1/2 Hr. In.	2 Hr. In.	3 Hr. In.
TS6x6x 1/4	0.24	0.073	0.226	0.367	NR

CARBOLINE CO — TYPE FIREFILM S1.

Investigated for Interior Conditioned Space and Interior General Purpose.

4. **Carbon Fiber Mesh** — (Optional, Not Shown) For three hour rating: Nom. 3/16 in. by 3/16 in. 3.50 oz/sq yd carbon fiber mesh to cover the entire surface. The depth at which the reinforcing mesh is placed shall be approximately 0.120 inches from the steel substrate.

5. **Top Coat** — (Not Shown) - No topcoat required for Interior Conditioned Space. Finishing topcoat for Interior General Purpose, Types Carboguard 893 SG or Sanitile 655 applied at 0.006 in. dry film thickness or Carbocrylic 3350 or Carbocoat 30R applied at 0.003 in. dry film thickness.

*** 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 2017-10-20

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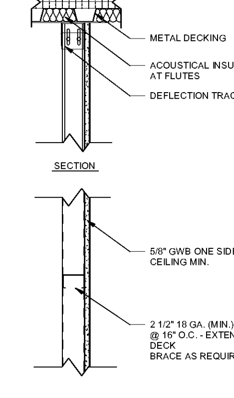
UL LISTING X661 — 8

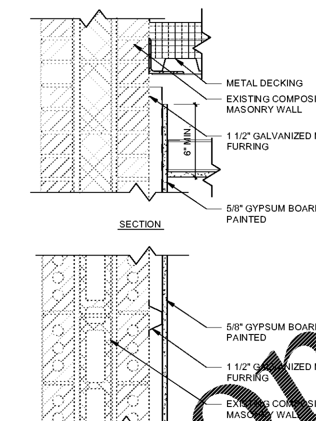
GENERAL WALL NOTES:

1. WALL TYPES ARE KEYED ON THE FLOOR PLANS.
2. ALL PENETRATIONS TO BE SEALS WITH ACOUSTICAL SEALANT AT NON-RATED WALLS WITH SOUND ATTENUATION BATTS.
3. DENS ARMOR BOARD OR EQUAL IS TO BE SUBSTITUTED FOR GYPSUM BOARD AT WALLS TO RECEIVE CERAMIC TILE. MAINTAIN RATINGS AS REQUIRED.
4. PENETRATING ITEMS PASSING ENTIRELY THROUGH BOTH PROTECTIVE MEMBRANES OF BEARING WALLS REQUIRED TO HAVE A FIRE-RESISTIVE RATING AND WALLS REQUIRING PROTECTED OPENINGS SHALL BE PROTECTED WITH THROUGH-PENETRATION FIRE STOPS
5. ALL LAYERS ARE TO BE TAPED AND MUDDED (ALL WALL TYPES).
6. ALL WALLS ARE TO BE FINISHED SMOOTH (ALL WALL TYPES).
7. PROVIDE FIRE SAFING BETWEEN TOP OF STUD AND STRUCTURE AS REQUIRED PER SECTION 707 OF SOUTH CAROLINA BUILDING CODE - AT ALL RATED WALLS.
8. CONTRACTOR TO PROVIDE MEANS OF ACCOMMODATING MOVEMENT AT TOP TRACK OF NON-LOAD BEARING STUD WALLS RUNNING PERPENDICULAR TO THE METAL DECK.

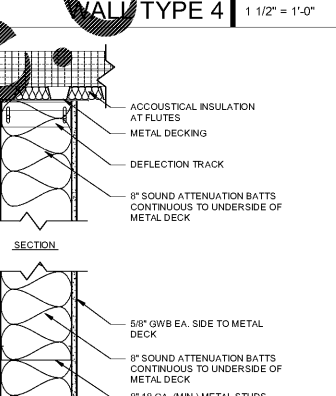
WALL NOTES — 6



WALL TYPE 5 — 1 1/2" = 1'-0" — 5



WALL TYPE 4 — 1 1/2" = 1'-0" — 4

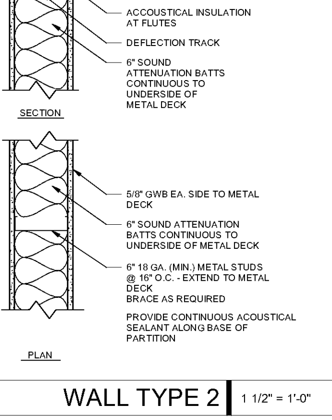


WALL TYPE 3 — 1 1/2" = 1'-0" — 3

WALL TYPE 2:
6" STUD W/ GYP. WALL BOARD ON BOTH SIDES

WALL TYPE 2A:
6" STUD W/ GYP. WALL BOARD ONE SIDE, WATER/MOLD RESISTANT REINFORCED TILE BACKER BOARD W/ TILE ONE SIDE

WALL TYPE 2B:
6" STUD W/ WATER/MOLD RESISTANT REINFORCED TILE BACKER BOARD W/ TILE BOTH SIDES



WALL TYPE 2 — 1 1/2" = 1'-0" — 2

WALL TYPE 1:
3 5/8" STUD W/ GYP. WALL BOARD ON BOTH SIDES

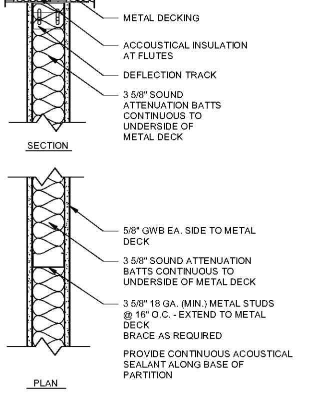
WALL TYPE 1A:
3 5/8" STUD W/ GYP. WALL BOARD ON ONE SIDE

WALL TYPE 1B:
3 5/8" STUD W/ WATER/MOLD RESISTANT REINFORCED TILE BACKER BOARD W/ TILE ONE SIDE

WALL TYPE 1C:
3 5/8" STUD W/ GYP. WALL BOARD ONE SIDE, WATER/MOLD RESISTANT REINFORCED TILE BACKER BOARD W/ TILE ONE SIDE

WALL TYPE 1D:
3 5/8" STUD W/ 2 LAYERS OF 1/4" GYP. WALL BOARD ONE SIDE

WALL TYPE 1E:
3 5/8" STUD W/ 1 LAYER OF 5/8" PLYWOOD ONE SIDE



WALL TYPE 1 — 1 1/2" = 1'-0" — 1

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BID DOCUMENTS

WALL TYPES & UL DETAILS

DATE: 04.05.2019
PROJECT NO: 16063

REVISIONS
NO: DATE: DESCRIPTION:

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