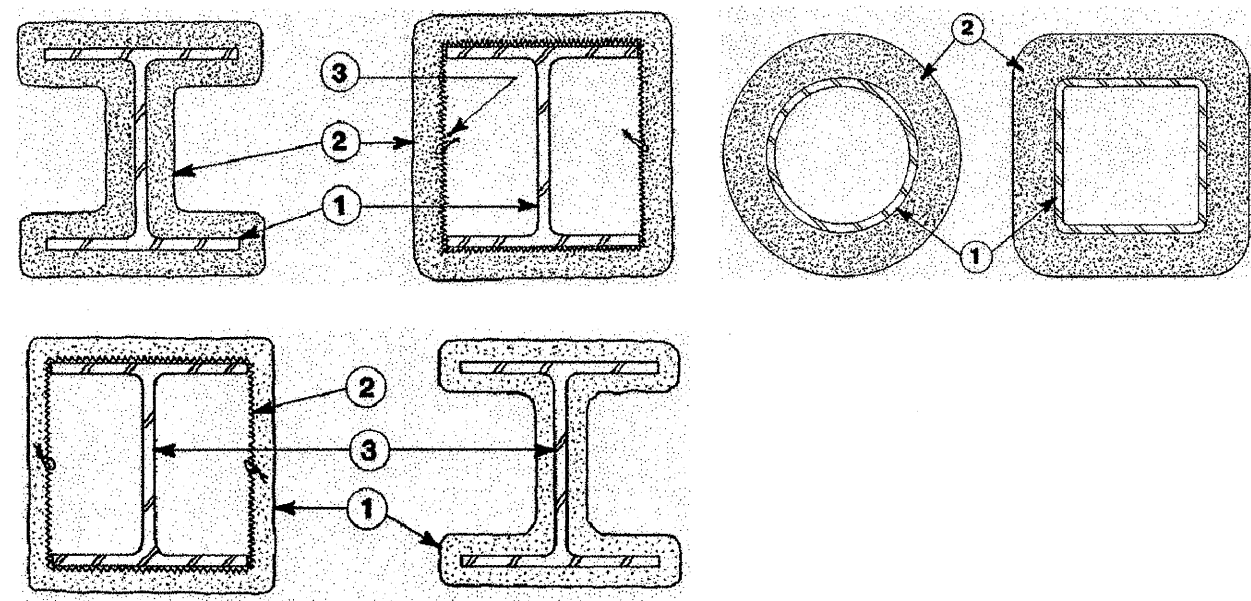


STEEL COLUMN FIRE SPRAY ASSEMBLY
UL - X764 (1 HOUR RATING)



12 U.L. #X650
1 HOUR FIRE RATING

- Steel Column, Steel Pipe or Steel Tube Wide flange steel column (W) or steel circular pipe (SP) or steel square or rectangular tube (ST) or min sizes as shown in the table below.
- Spray-Applied Fire Resistant Materials* Applied by mixing with water and spraying in more than one coat to the thicknesses shown below, to steel surfaces which are clean and free of dirt, loose scale and oil. Min avg and min ind density of 40 and 36 lbs per sq ft, respectively. For method of density determination, see Design Information Section, Sprayed Material.

The min thickness of Spray-Applied Fire Resistant Materials required for various fire resistance ratings of cantours sprayed or boxed wide flange columns are shown in the table below:
The thickness of Spray-Applied Fire Resistant Materials to be applied to all surfaces of the column (Item 1) required for rating periods of 1 hr, 1-1/2 hr, 2 hr, 3 hr, 4 hr may be determined by the equation:

$$h = R / 1.05 (W/D) + 0.61$$

Where:
h=Spray-Applied Fire Resistant Materials thickness in the range 0.25-3.875 in.
R=Fire resistance rating in hours (1-4 hr)
D=Heated perimeter of steel column in inches
W=Weight of steel column in lbs per foot
W/D=0.33 to 6.62

As an alternate to the equation, the min thickness of Spray-Applied Fire Resistant Materials required for various fire resistance ratings of cantours sprayed or boxed wide flange columns are shown in the table below:

| Column Size in. | Minimum Thickness - Inches (2 hour) |
|-----------------|-------------------------------------|
| W6x9 | 1-3/4 |
| W6x12 | 1-3/4 |
| W6x16 | 1-5/8 |
| W6x26 | 1-3/8 |
| W10x49 | 1-1/8 |
| W12x73 | 1-1/8 |
| W12x106 | 1-1/8 |
| W14.233 | 9/16 |
| W14x730 | 5/16 |

The hourly rating of the structural member is dependent upon the ratio of A/P and the thickness of Spray-Applied Fire Resistant 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 rectangular or square tube is determined by:

$$A/P \text{ tube} = t(a + b - 2t) / a + b$$

Where:
a=the outer width of the tube (in.)
b=the outer length of the tube (in.)
t=the wall thickness of the tube (in.)

The thickness of Spray-Applied Fire Resistant Materials for ratings of 3/4, 1, 1-1/2, 2, 3 and 4 hr of a steel pipe or tube can be determined by the equation:
 $h = R - 0.2 / 4.43 (A/P)$

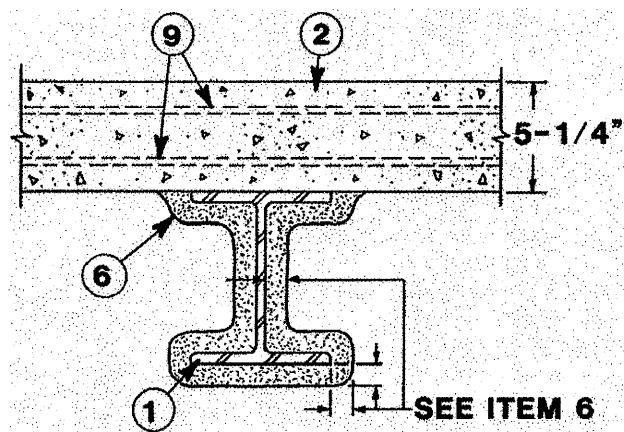
Where:
R=the hourly rating (hrs)
h=the thickness of Spray-Applied Fire Resistant Materials, minimum 1.4 in., maximum 3-7/8 in.

As an alternate to the equation, the min thickness of Spray-Applied Fire Resistant Materials required for various fire resistance ratings of cantour sprayed steel pipes or tubes are shown in the table below:

| Column | Minimum Thickness Inches (2 hour rated) |
|---|---|
| ST 4x4x5/16in | 1-7/16 |
| ST 4x4x1/2in | 15/16 |
| W R GRACE & CO - CONN | |
| CONSTRUCTION PRODUCTS DIV -- Type Z-146. Investigated for exterior use. | |
| GRACE KOREA INC -- Type Z-146. Investigated for exterior use. | |

- Metal Lath (Optional for cantour application) -- 3.4 lbs per sq yd galv or painted expanded steel lath. Lath shall be lapped 1 in. and tied together with No. 18 SWG galv steel wire spaced vertically 6 in. OC.

*Bearing the UL Classification Marking



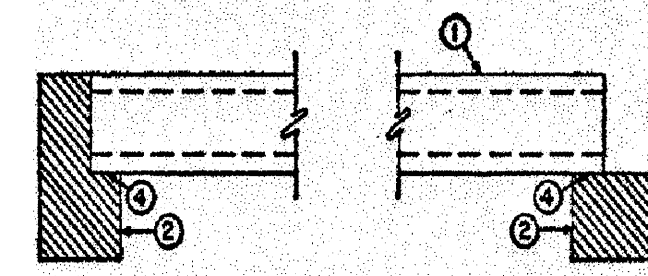
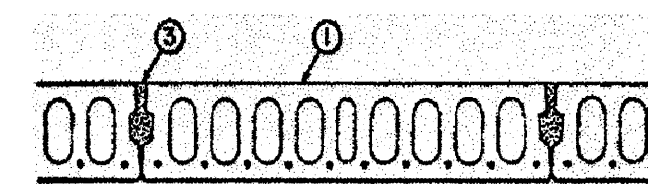
13 STEEL BEAM ENCLOSURE
2 Hour Fire Rated - U.L. NO. N764

- Steel Beam -- W8x26, min size.
- Normal Weight or Lightweight Concrete -- Compressive strength, 3500 psi. For normal weight concrete, either carbonate or siliceous aggregate may be used. Unit weight: 148 pcf for normal weight concrete, 148 pcf for lightweight concrete.
- Shear Connector -- (Optional) -- Studs, 3/4 in. diam headed type or equivalent per AISC specifications. Welded to the top flange of beam through the steel floor units.
- Welded Wire Fabric -- 6X6-10/10 SWG.

- Steel Floor and Form Units* -- 1-1/2 to 3 in. corrugated, fluted or cellular units.
- Spray-Applied Fire Resistant Materials* -- Applied by mixing with water and spraying in more than one coat to the beam to the final thicknesses shown below. When fluted or corrugated steel floor units are used, crest areas above the beam shall be filled with Spray-Applied Fire Resistant Materials. Beam surfaces shall be clean and free of dirt, loose scale and oil. Min avg density of 23 pcf with min ind density of 21 pcf. For method of density determination, see Design Information Section, Sprayed Material.

| Rating Hr | Restrained Beam Rating Hr | Unrestrained Beam Rating Hr |
|-----------|---------------------------|-----------------------------|
| 1 | 1.02 | 1.02 |
| 2 | 1.98 | 1.98 |
| 3 | 2.94 | 2.94 |
| 4 | 3.90 | 3.90 |

- Lath Hangers -- (For beam cage only) -- No. 6 SWG galv steel wire, spaced 27 in. OC max.
- Metal Lath -- (For beam cage only) -- 3.4 lb per sq yd expanded galv or painted steel, tied to lath hangers with No. 18 SWG galv steel wire, spaced 6 in. OC max.
- Steel Reinforcement -- As specified in the latest ACI 318 Building Code for reinforced concrete, connected to beam top flange.

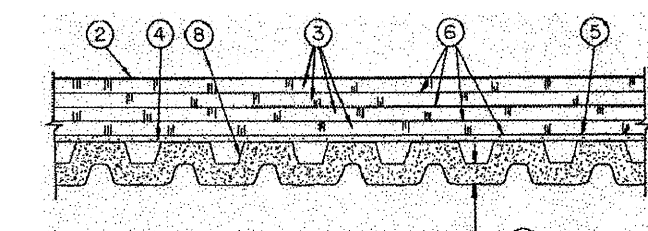


14 BASED ON U.L. NO. J925;
2 HOUR FIRE RATED (STC 59)

FLOOR/CEILING ASSEMBLY

- Precast Concrete Units* -- 8, 10 and 12 in. thick units. Normal weight aggregate. Cross section similar to the above illustration.
- End Details -- Restrained and Unrestrained.
- Grout -- Sand cement type, 3500 psi compressive strength.
- Min Bearing -- 1-1/2 in.

*Bearing the UL Classification Mark



15 BASED ON U.L. NO. P719;
2 HOUR FIRE RATED

ROOF/CEILING ASSEMBLY

- Steel Supports -- W6x16 steel beam min size, 10 K1, min. size steel joist. As alternate to steel beam or steel joist, joist girders (Not Shown) -- 20 in. min depth and 13 lb/in ft min weight.
- In lieu of Item 2, roof covering consisting of single-ply Roofing Membranes* -- that is either ballasted, adhered or mechanically attached as permitted under the respective manufacturer's Classification.
- Roof Insulation-Foamed Plastic* -- 36 by 48 in. (min size) polyisocyanurate foamed plastic insulation boards applied over the gypsum wallboard (Item 4) in one or more layers. Min thickness is as outlined in Item 9. (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.
THE DOW CHEMICAL CO -- Types Hy-Therm AP, Hy-Therm Tapered or Equal
- Gypsum Board -- (Classified or unclassified) -- Supplied in sheets from nam 2 by 4 ft to 4 by 12 ft, by nam 5/8 in. thick. Min weight 2.2 pcf applied perpendicular to steel roof deck direction with adhesive (Item 6), hot asphalt (Item 6A) 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.
- Vapor Retarder-Sheathing Material* -- (Optional) -- Vinyl film or paper scrim vapor barrier, applied to steel roof deck with adhesive (Item 6), asphalt (Item 6A) or laid loosely, overlapped approximately 2 in. on adjacent sheets. See Sheathing Material (CHIZ) category for names of manufacturers.
- 6B. 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* (CHFX) 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 SYNTHEC INCORPORATED -- FAST 100 or Equal
- Mechanical Fasteners -- (Optional -- Not Shown) -- Mechanical screw-type fastener with metal washer designed for the purpose may be used to attach one or more layers of insulation to steel roof deck.

- Steel Roof Deck -- (Unclassified) -- Min 1-1/2 in. deep and 30 or 36 in. wide galv or painted fluted steel deck. When unclassified painted roof deck is used, the use of Item 9A, Metal Lath, is required. 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 and 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-lapping steel screws spaced a max of 36 in. OC. Classified Steel Floor and Form Units -- 1-1/2, 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-lapping steel screws spaced a max of 36 in. OC.
UNITED STEEL DECK INC -- Types B5, B1, F, NS, NI. Units may be phos/ptd or ptd/ptd or Equal

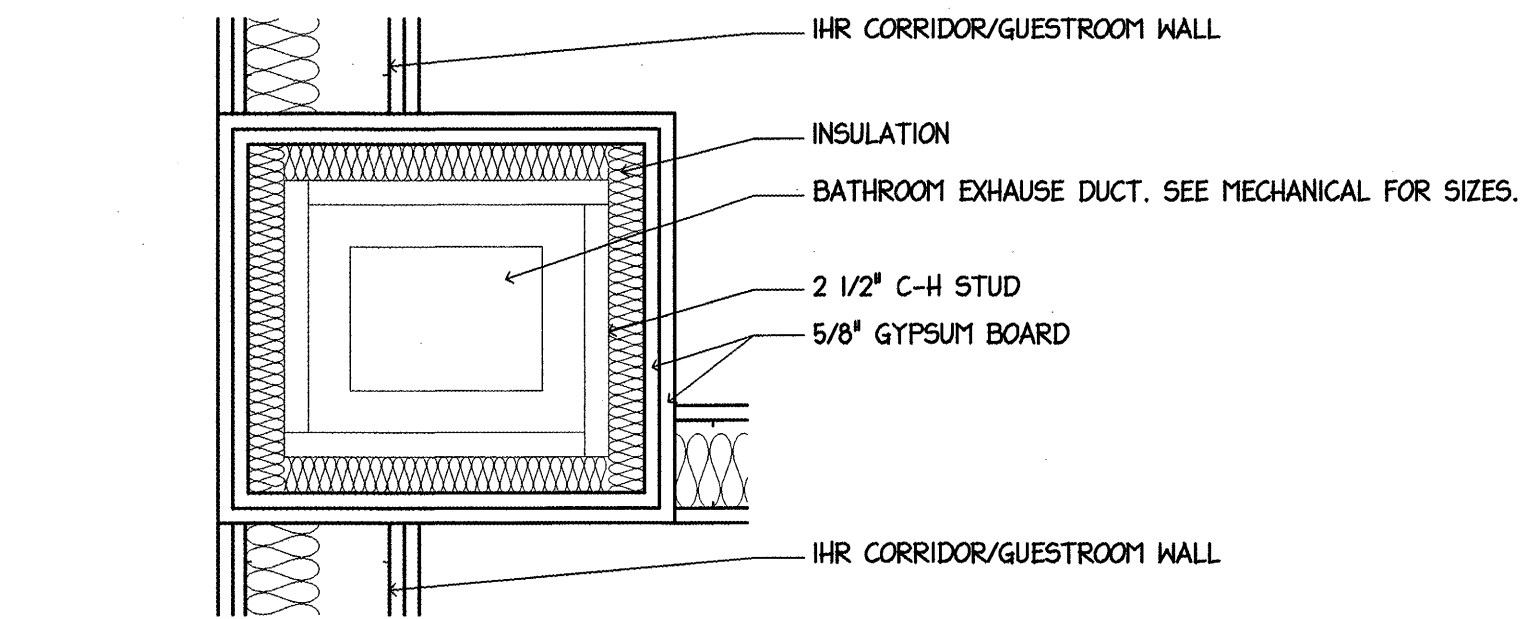
- Spray-Applied Fire Resistant Materials* -- Applied by mixing with water and spraying in one or more coats to the thicknesses shown below, to steel surfaces which are clean and free of dirt, loose scale, and oil. Min average and min individual density of 17.5 and 16 pcf, respectively, for Types 300, 300ES, 300N and SB. Min average and min individual density of 22 and 19 pcf, respectively, for Type 400. For method of density determination, see Design Information Section, Sprayed Material. Spray-Applied Fire Resistant Materials on steel deck shall cover screw tips by 1/2 in. min. Use of adhesive (Item 12) is required.
The min thickness of Spray-Applied Fire Resistant Materials required for various fire resistance ratings are shown in the table below:

| Restrained Assembly Rating Hr | Unrestrained Assembly Rating Hr | Unrestrained Beam Rating Hr | Min Insulation or Building Unit Core Thkns In.** | Protection Thkns In. | | | |
|-------------------------------|---------------------------------|-----------------------------|--|----------------------|-------|-----------|-----------|
| | | | | Deck | Beam | Joist (a) | Joist (b) |
| 1 | 1 | 1 | 0 | 1/2 | 7/16 | 1 (3/4) | 1 (3/4) |
| 1-1/2 | 1-1/2 | 1-1/2 | 0 | 13/16 | 9/16 | 15/16 | 1-3/16 |
| 1-1/2 | 1-1/2 | 1-1/2 | 1 | 3/4 | 9/16 | 15/16 | 1-3/16 |
| 2 | 2 | 2 | 0 | 1-1/8 | 13/16 | 1-3/16 | 1-3/16 |
| 2 | 2 | 2 | 1 | 1-1/16 | 13/16 | 1-3/16 | 1-3/16 |
| 2 | 2 | 2 | 2 | 15/16 | 13/16 | 1-3/16 | 1-3/16 |
| 3 | 2 | 3 | 1 | 1-1/16 | 1-1/4 | 1-5/8 | 1-5/8 |
| 3 | 2 | 3 | 2 | 1-1/2 | 1-1/4 | 1-5/8 | 1-5/8 |

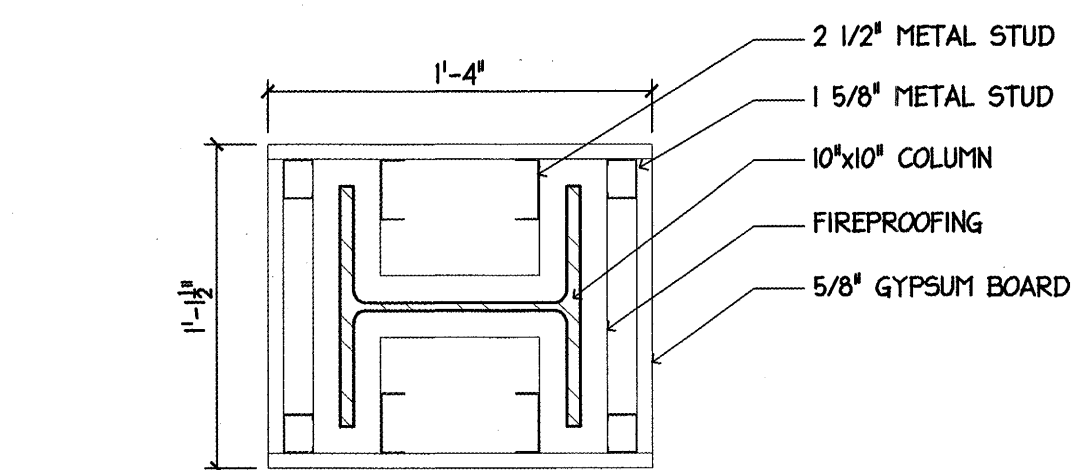
- *The 3/4 in. thickness may be used when the joist is limited to a maximum tensile stress of 26,000 psi.
**Refers to Item Nos. 3, 3B, 3E, 3F, 3G, and 3H. For Item Nos. 3A, 3C, or 3D, refer to individual description for min thickness.
#The required minimum thickness of Spray-Applied Fire Resistant Materials 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 6B is used.
ISOLATEK INTERNATIONAL -- Type 300, Type 300ES, Type 300N, Type 400 or Type SB or Equal

- Adhesive* -- Applied to steel roof deck in accordance with manufacturer's instructions. ISOLATEK INTERNATIONAL -- Type EBS or Type X or Equal

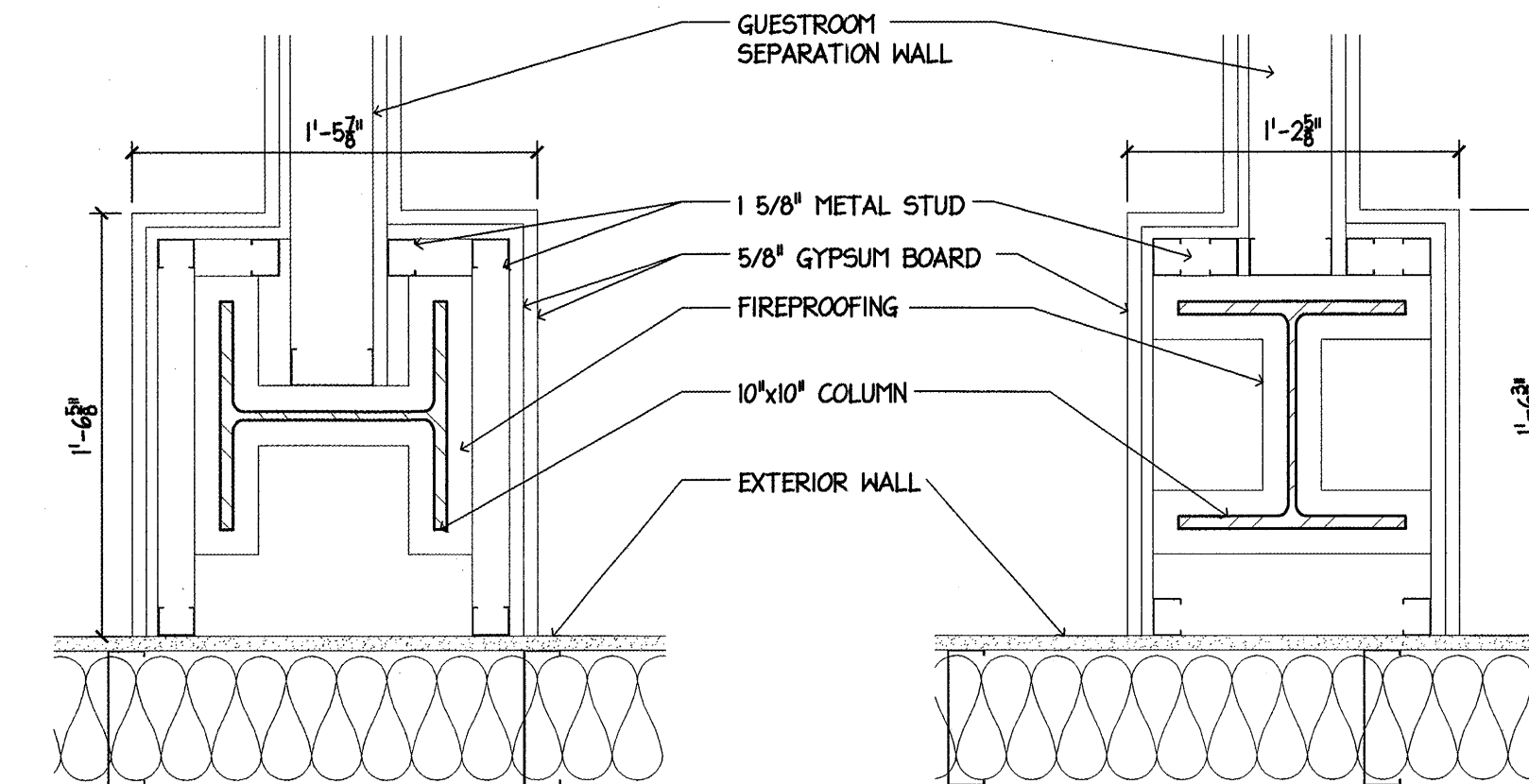
*Bearing the UL Classification Marking



A GUEST BATH VENT SHAFT DETAIL
1 1/2" x 1'-0"



B FREESTANDING COLUMN DETAIL
1 1/2" x 1'-0"



C COLUMN DETAIL
1 1/2" x 1'-0"

D COLUMN DETAIL
1 1/2" x 1'-0"

Note:
To maintain integrity of fire rating and STC on demising wall finish material must wrap column. Follow profile of column as required. Column placement may vary.

GENERAL NOTES:
ALL U.L. LISTED ASSEMBLIES MUST BE CONSTRUCTED PER U.L. GUIDELINES

* ALL FRAMING TO RUN FULL HEIGHT TO STRUCTURE

* PROVIDE MOISTURE RESISTANT GYPSUM BOARD IN ALL BATH ROOMS, KITCHENS AND NET AREAS TYPICAL ALL WALL TYPES

* PROVIDE EXPANSION JOINTS IN GYPSUM BOARD @ 20'-0" O.C. MAX.

* ALL RATED ENCLOSURES TO BE TAPED AND COMPOUNDED PER U.L. LISTING AND SPECIFICATIONS

* PROVIDE VAPOR BARRIER ON WARM SIDE OF WALL AT POOL AREA FULL HEIGHT TO STRUCTURE

FOAM INSULATION NOTE:

ALL FOAM INSULATION IS SEPARATED FROM INTERIOR BY A THERMAL BARRIER IN COMPLIANCE W/ CODE SECTION 2603.5.2. FOAM SHALL MEET FLAME TESTS PER CODE SECTION 2603.5.4 & 2603.5.3. IT SHALL NOT EXCEED A THICKNESS OF 4".

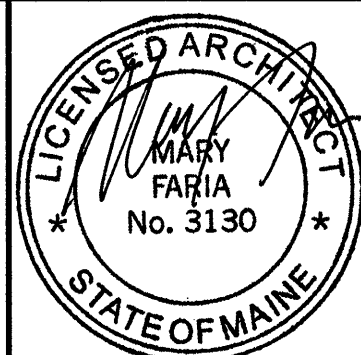
EXTERIOR WALL GENERAL NOTE:

ALL DENS GLASS SHEATHING TO BE TAPED AT JOINTS

ALL OPENINGS IN EXTERIOR WALLS TO RECEIVE PEEL AND STICK CONTINUOUS MEMBRANE AT PERIMETER TO SEAL OPENINGS

PERMIT ISSUE - 09/27/07

| NO. | REVISION | DATE |
|-----------------|---------------|----------------|
| SCALE: As Noted | DRAWN BY: AVS | CHECKED BY: JR |



PROJECT

RESIDENCE INN BY MARRIOTT

PORTLAND, ME

JOB# 802

TITLE

**WALL TYPE LEGEND
UL ASSEMBLIES**

GROUP ONE
21 W. THIRD STREET, BOSTON, MA 02127
TEL: (617)268-7000 FAX: (617)268-0209

DRAWING NO.

