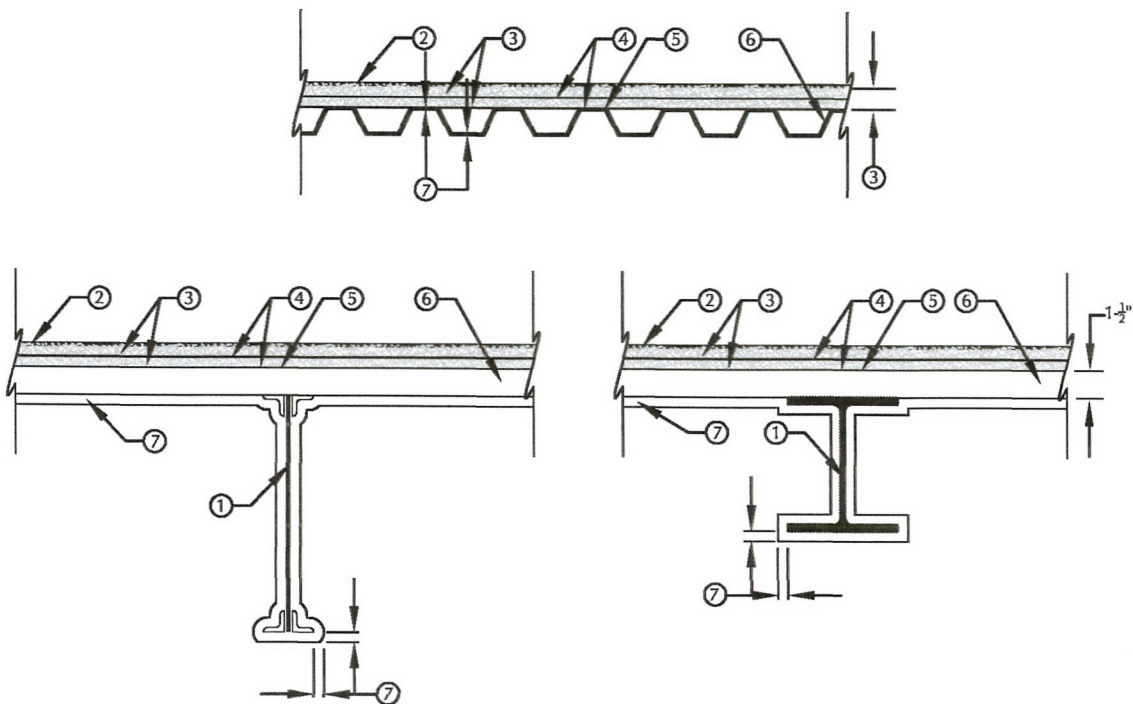




Shield Industries, Inc.

ASM-5

ROOF ASSEMBLY - W6x16 MIN. "I" BEAM, STEEL JOISTS (SEE 1A)



SCALE: N.T.S.

FIRE TEST ENDURANCE RATING:	1 HOUR
STANDARD TESTED TO:	ASTM E-119
FIRE TESTED LABORATORY:	GUARDIAN FIRE TESTING LABORATORIES, INC. 480 HINMAN AVE. BUFFALO, NY 14216
REPORT NO:	GL58812 & GL115611
PRODUCT:	ForceField® FireGuard® E-84 INTUMESCENT COATING (FFG E-84)
MANUFACTURER:	SHIELD INDUSTRIES, INC. 131 SMOKEHILL LANE WOODSTOCK, GA 30188

* SEE MANUFACTURER APPLICATION INSTRUCTIONS AND SPECIFICATIONS FOR SURFACE PREPARATION AND APPLICATION PROCESS



1. **Beam** – W6x16 min. size. As alternate to steel beams,
Joist girders – (not shown) – 20 in. min depth and 13 lb per lin ft min weight.

1A. **Steel Joists** – Types 10J4, 10H4, 12J4, 14J7 or 14K4 min size.

Note: Design loads shall stress 10H4 joist to a max tensile stress of 22KSI

2. **Roof Covering*** - Consisting of hot mopped or cold application materials compatible with insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Roof Covering Materials (TEVT)

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 UL Fire Resistance Directory – Roofing Membranes (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 UL Fire Resistance Directory – Metal Roof Deck Panels (CETW).

3. **Roof Insulation** – May consist of the following:

A. **Mineral and Fiber Boards*** - Min thickness $\frac{3}{4}$ in. for the 1 and 1- $\frac{1}{2}$ hr. assembly ratings and 1- $\frac{3}{4}$ in. for the 2 hr. assembly rating. Min thickness is 1- $\frac{3}{4}$ in. otherwise. Max thickness 4 - $\frac{7}{8}$ in. to be applied in two or more layers with adhesive applied between layers of boards and to vapor retarder or roof deck if vapor retarder is not used. As an alternate, the first layer of insulation may be attached to the roof deck by self drilling, self tapping steel screws pierced through 3 $\frac{1}{4}$ in. hexagonal steel plates spaced min. 15 in. O.C. The min cover of ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84) to the end of the screw shall be $\frac{1}{2}$ in. The second layer of insulation may be secured to the first layer with 30 lb of hot mopping asphalt per 100 sq. ft. Each layer of board to be offset in both directions from layer below a min of 6 in. A secondary membrane consisting of Type G1 or G2 mats or Type 15 felt may be used between layers of roof insulation. Secondary membrane secured in place with 25 lb. of hot mopping asphalt per 100 sq ft. Insulation may be installed in a single layer if the Restrained and Unrestrained Assembly Ratings are limited to 1 hr of if a $\frac{5}{8}$ in. thick layer of gypsum sheathing is placed on the steel roof deck units. Joints between insulation and sheathing shall be staggered.

FIBREX INSULATIONS INC – FBX Baseboard and FBX Capboard.

OWENS CORNING HT INC, DIV OF OWENS CORNING

ROXUL INC – Toprock.



Shield Industries, Inc.

SIPLAST INC

B. Gypsum Board – (Classified or Unclassified, not shown) – 5/8 in. thick gypsum wallboard, min weight 2.0 psf, may be used with the above insulation to obtain various Unrestrained and Restrained Assembly Ratings as described in Item 7. Installed perpendicular to the steel roof deck with joints staggered and occurring over the crests of the roof deck. Secured to the roof deck with adhesive (Item 4) or with asphalt applied to a min of 50 percent of the crest surface at a rate of 12 to 15 lbs per 100 sq. ft or with mechanical fasteners. If mechanical fasteners are used, the end of the fasteners shall be covered with a min 60 MIL (dry thickness) ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84)

4. Adhesive* - Optional – Adhesive may be used to attach each layer of roof insulation. The adhesive may be applied in ½ in. wide ribbons approx. 6 in O.C. at 0.4 gal/100 sq ft. In lieu of adhesive, the first layer of roof insulation may be secured with asphalt applied to a min of 50 percent of the crests surface at a rate of 12 to 15 lbs per 100 sq ft or with mechanical fasteners. If mechanical fasteners are used, the fastener shall not penetrate through the ForceField® FireGuard® Intumescent Coating.

See Adhesives UL (BYWR) category for names of Classified companies

5. Sheathing Material* - (Optional) Vinyl film or paper scrim vapor barrier applied with adhesive or laid loosely on the steel roof deck, overlapped approx 2 in. at sides.

See UL Sheathing Material (CHIZ) category for names of Classified companies.

5A. Sheathing Material* - (Optional) – A self-adhered rubberized asphalt roofing underlayment membrane which may be placed on top of the gypsum wallboard (Item 3B) or on the roof insulation (Item 3A)

W R GRACE & CO – CONN

CONSTRUCTION PRODUCTS DIV – Grace Ice and Water Shield, Grace Select, Grace Ultra, and Grace Basik.

5B. Sheathing Material* - (Optional) – In lieu of Items 5 and 5A, a self-adhered rubberized asphalt roofing underlayment membrane which may be placed on top of gypsum wallboard or on the roof insulation (Item 3A).

CARLISLE COATINGS & WATERPROOFING INC. – CCW-707.



6. **Steel Roof Deck** - Unclassified – Min 1-1/2 in. deep and 18 in. wide, galv fluted steel deck. Min gauge is 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports min 12 in O.C. Adjacent units button-punched or welded together at midspan along side joints: or

Classified Steel Floor and Form Units* - Noncomposite 1 ½ in deep, 36 in. wide, galv fluted steel deck. Min gauge in 22 MSG. Ends overlapped at supports min 1 ½ in and welded to supports a max 12 in. O.C. Adjacent units button-punched or welded together at midspan along side joints.

CONSOLIDATED SYSTEMS INC. – Types B, BI, F, N, NI. Units may be phos/ptd.

7. **ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84)** – Applied by spraying or brush painting more then 1 coat to achieve a final thickness per the table below. Preparation of steel members: Clean free of dirt, loose scale and oil. Apply 2 Mil (dry thickness) Alkyd Primer.

For method of Mil determination, refer to Design Information Section.

For the W6x16 wide flange beams, the thickness of ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84) shall be 30 Mil (dry thickness) for the 1 hr. Unrestrained Beam Rating, 45 Mil (dry thickness) for the 1-1/2 hr. Unrestrained Beam Rating, and 60 Mil (dry thickness) for the 2 hr Unrestrained Beam Rating.

The joist projection shall be applied in the manner and at the thickness shown below:

Min Joist Size	Type of Application	Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Thickness of FFG E84 Intumescent Coating, in MIL (dry thickness)
14J7	Direct	1	1	1	45
10J4, 10H4	Direct	1	1	1	45
10J4, 10H4	Direct	1 1/2	1 1/2	1 1/2	-
10J4, 10H4	Direct	2	2	2	-
12J4, 14K4	Direct	1	1	1	45
12J4, 14K4	Direct	1 1/2	1 1/2	1 1/2	-
12J4, 14K4	Direct	2	2	2	-



When W6x16 beams and min size 12J4, 14J7 or 14K4 joists are used, thickness of the ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84) applied to the roof deck units shall be:

Restrained or Unrestrained Assembly Rating Hr	Thickness of ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84) Applied to Deck	
	w/ Gypsum Sheathing	w/o Gypsum Sheathing
1	45	45
1 1/2	-	-
2	-	-

When min size 10J4 or 10H4 joists are used, thickness of ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84) applied to the roof deck units, with or without gypsum sheathing, shall be:

Restrained or Unrestrained Assembly Rating Hr	ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84) on Steel Deck Mil (dry thickness)
1	45
1 1/2	-
2	-

8. **Bridging** – (not shown) – In accordance with AISC current specifications. Continuous steel angles, min. size 1-1/4 by 1-1/4 by 1/8 in. welded on top and bottom chords. Bridging coated with 45 Mil (dry thickness) ForceField® FireGuard® E-84 Intumescent Coating (FFG E-84) for the 1 or 1-1/2 hr Assembly and Beam Rating and 60 Mil (dry thickness) for the 2 hr Assembly and Beam Ratings.

* Bearing the UL Classification Mark