

**FLUTE-FILL OPTIONS
For
Sprayed Fire Resistive Materials (SFRM)**

UL has clarified several allowable options available for treatment of the cavity areas formed above the flanges of beams where they pass under 100% fluted metal decking. The flute fill options depend on whether the beams run perpendicular or parallel to the flutes of the metal decking, and for the former, whether the top flange of the beam is less than or greater than 8 inches wide. The options are identified as follow:

A. Beams running perpendicular to the flutes of all (100%) fluted metal decking.

- a. Beams with flange widths of 8 inches or less
- b. Beams with flange widths greater than 8 inches

B. Beams running parallel to the flutes of metal decking

Within each major category are options that need to be reviewed. The details of these options are contained in the following pages of this Guidance Information Bulletin.

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A. Beams running perpendicular to the flutes of all (100%) fluted metal decking.

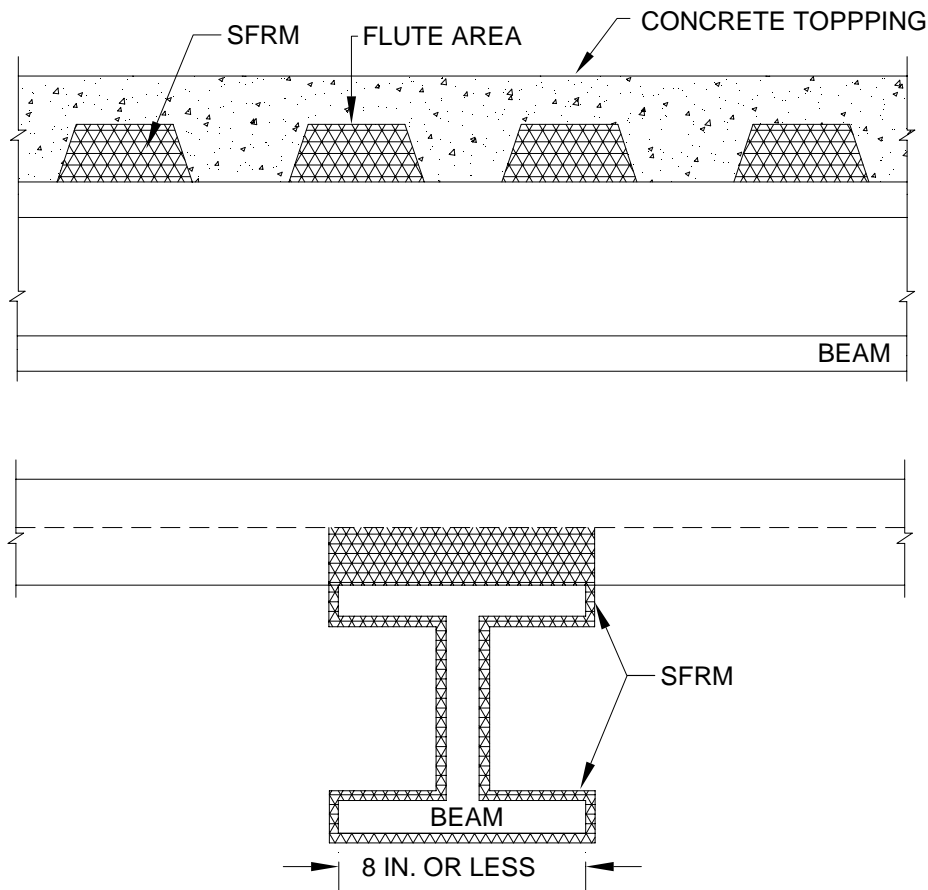
The following options are general in nature, supported by UL documentation¹, and applicable to all jobsites where these conditions occur. No confirmation letter is required.

Caution: Where a beam is a continuation of an hourly rated wall assembly, the sprayed fire resistive material is required to act as a component of a rated firestop system. Where this condition occurs, it is necessary to refer to a specific head of wall (HW) firestopping joint system for the required fireproofing protection details.

A.a. : Beams with flange widths of 8 inches or less

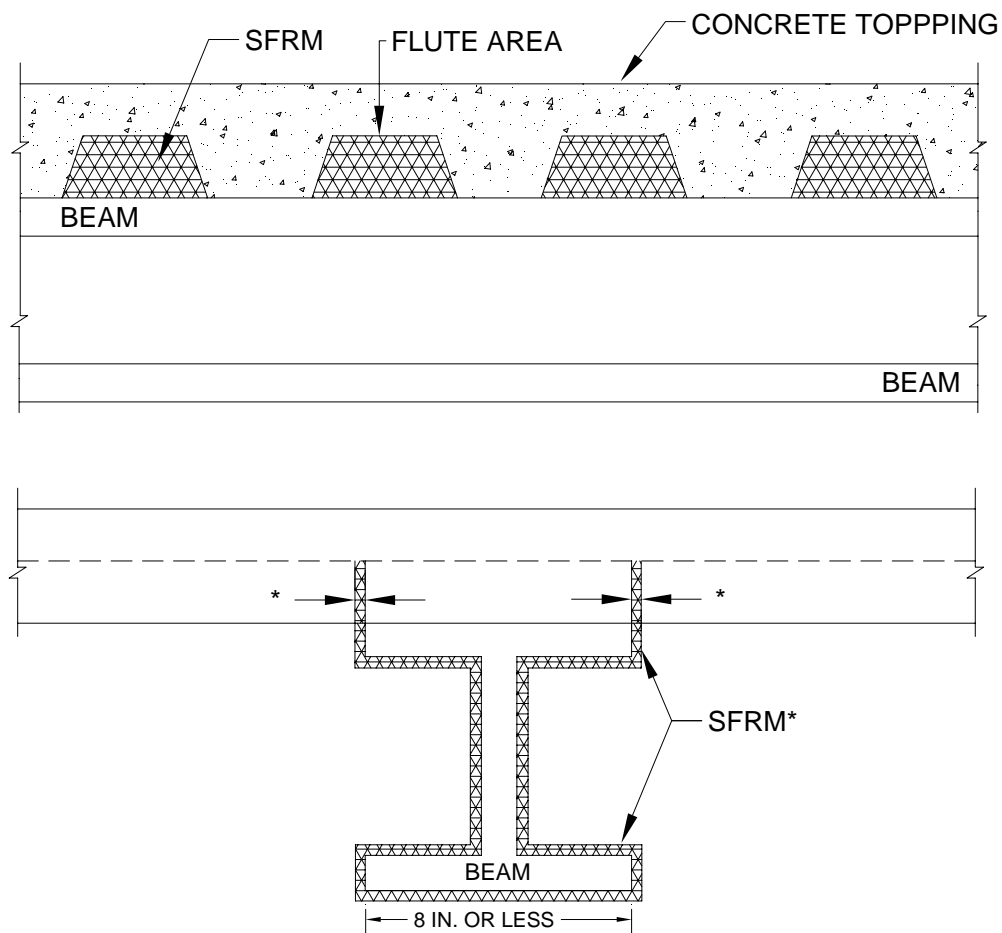
Option A.a.i : The flute cavity above the beam shall be completely filled with the sprayed fire resistive material (SFRM). There should be no void left above the beam. The thickness of SFRM on the beam can be taken from designs detailing only all fluted decking.

Option A) a.i.



Option A.a.ii : The flute cavity above the beam may be shrouded on both sides of the beam (sprayed as to just close the flute opening above the beam) with sprayed fire resistive material leaving a void above the beam. The thickness of the sprayed fire resistive material on the beam and forming the "face" closing openings on both sides of the beam must **be derived from a design consisting of a blend of cellular and fluted, or all cellular units.**

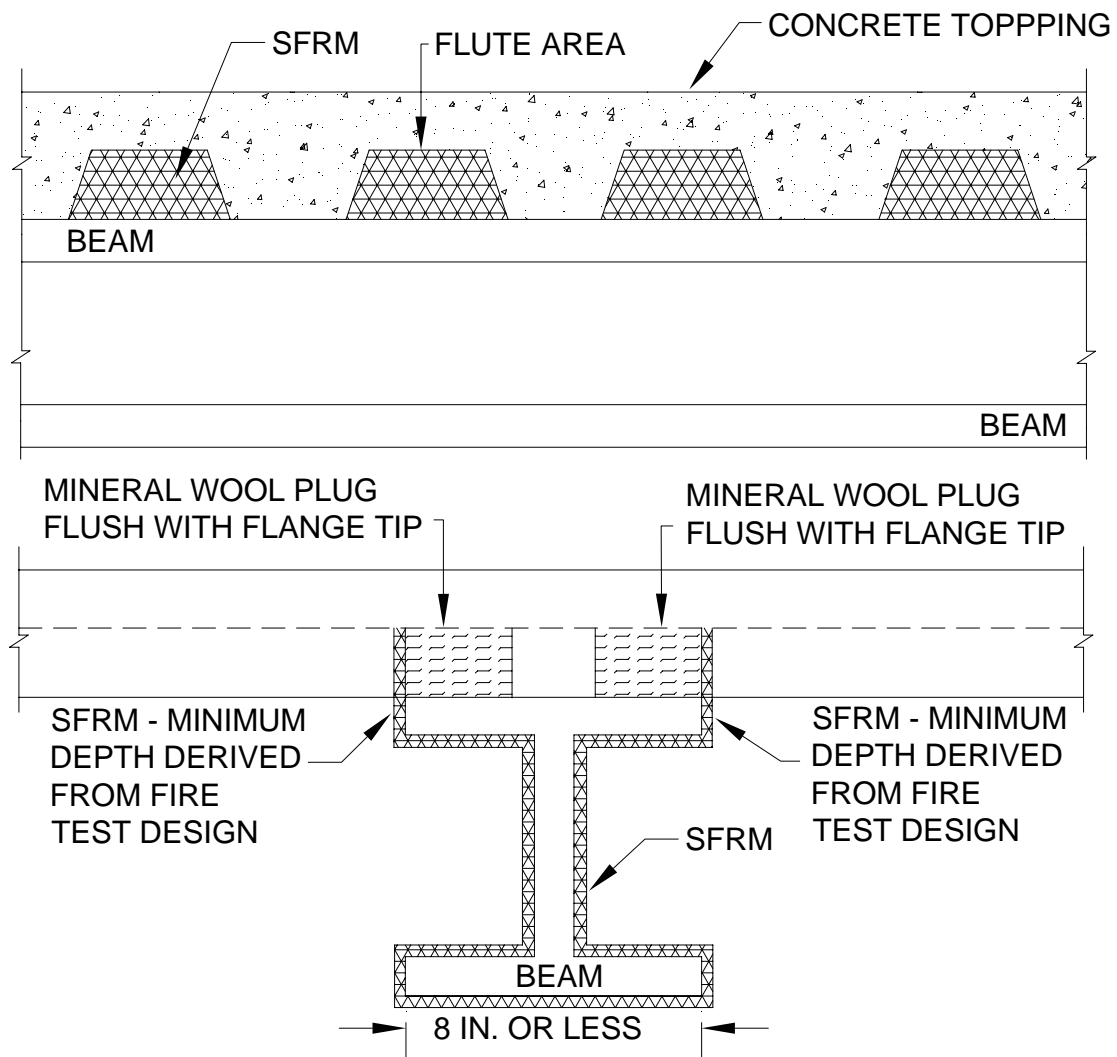
Option A) a.ii.



* NOTE. The thickness of the sprayed fire resistive material on the beam and forming the "face" closing openings on both sides of the beam must be derived from a design consisting of a blend cellular and fluted, or all cellular units.

Option A.a.iii : The flute cavity above the beam may be plugged with mineral wool cut flush with the flange tips of the beam. There is no minimum depth requirement for the mineral wool plug. The mineral wool plug above the beam is then sprayed on both sides of the beam, with sprayed fire resistive material. The thickness of the SFRM applied to the beam and to the exposed face of the mineral wool plug must be **derived from a design consisting of a blend of cellular and fluted or all cellular units.**

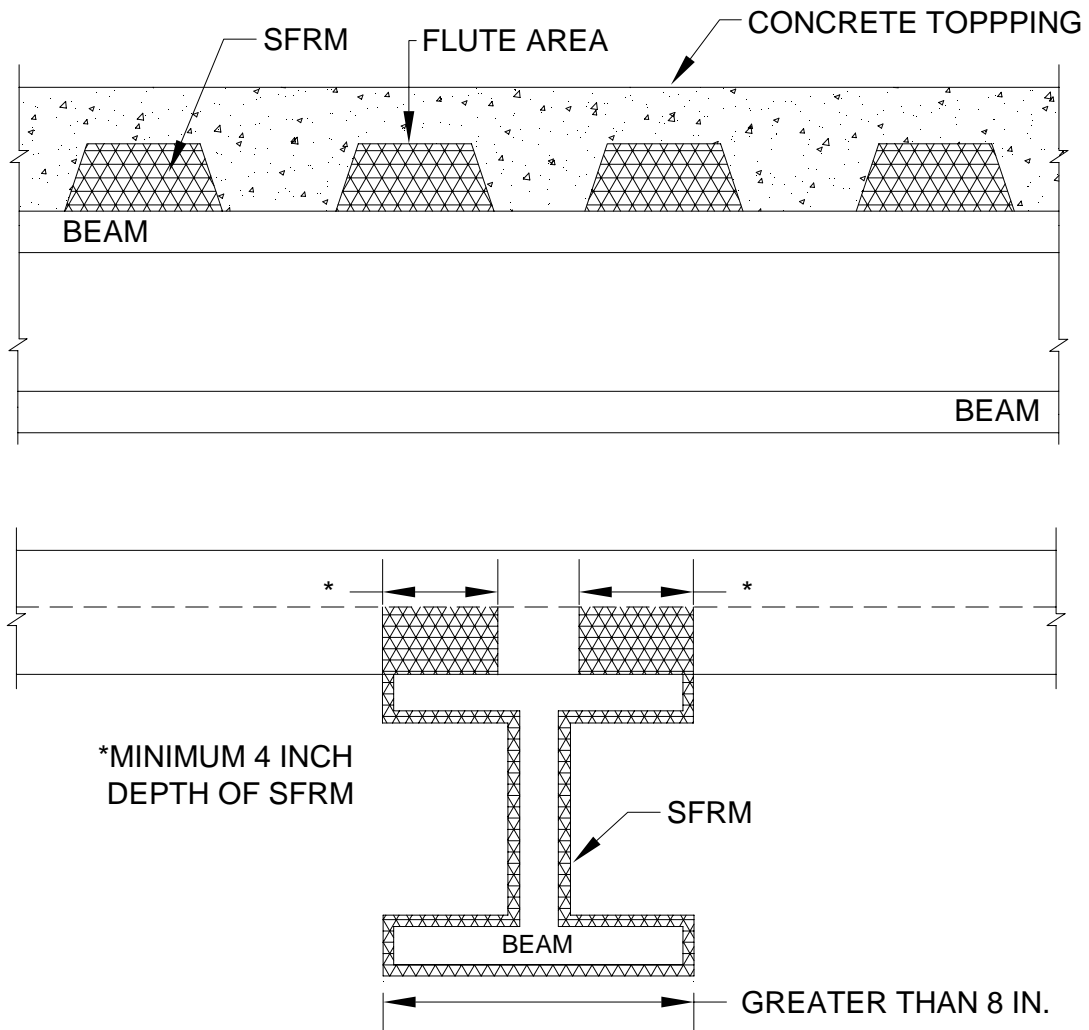
Option A) a.iii.



A.b. : Beams with flange widths greater than 8 inches

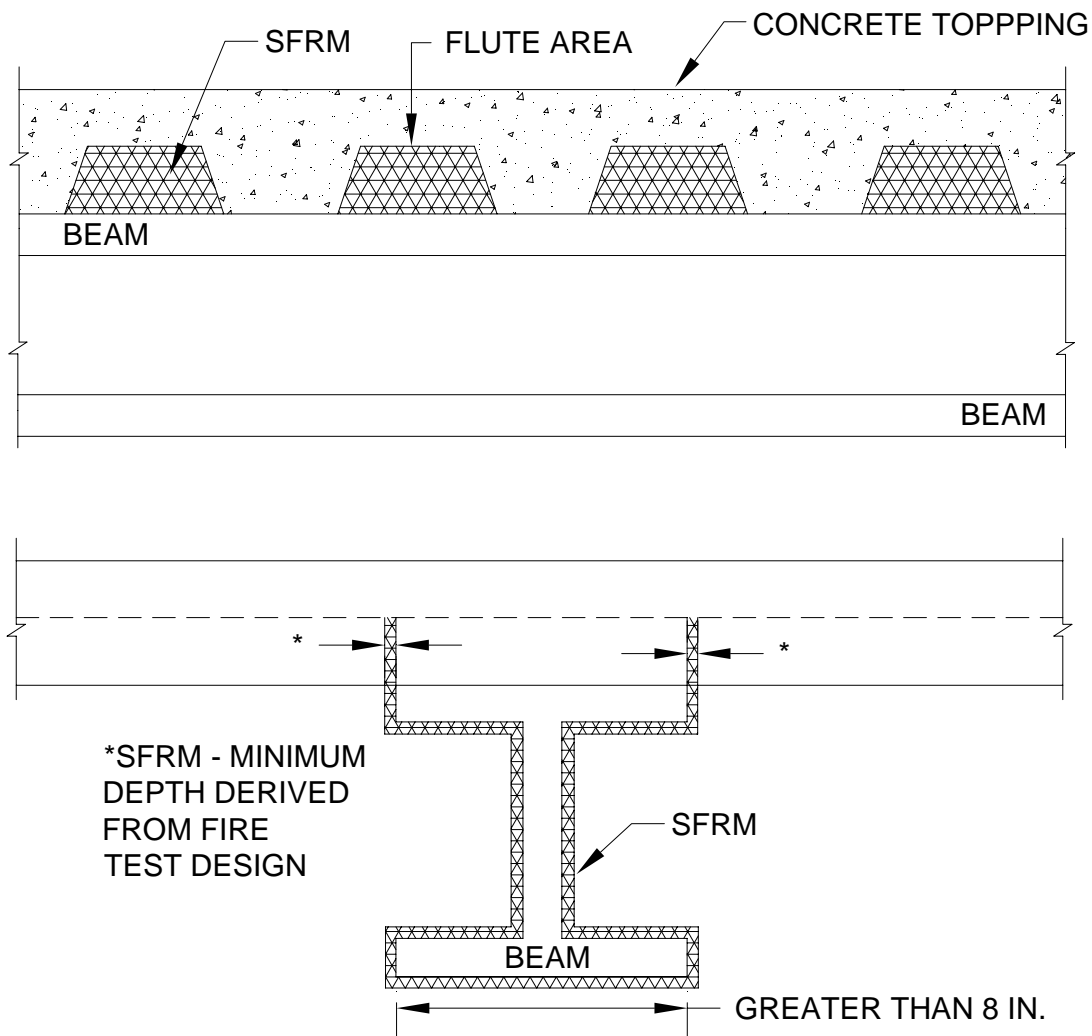
Option A.b.i : The flute cavity above the beam may be filled from both sides with a minimum thickness of 4 inches (from each side) of the sprayed fire resistive material. For beams with flange widths greater than 8 inches it is acceptable that there be a void left above the beam, between the two minimum 4 inch thicknesses of SFRM. **The thickness on the beam can be taken from designs detailing all fluted decking.**

Option A) b.i.



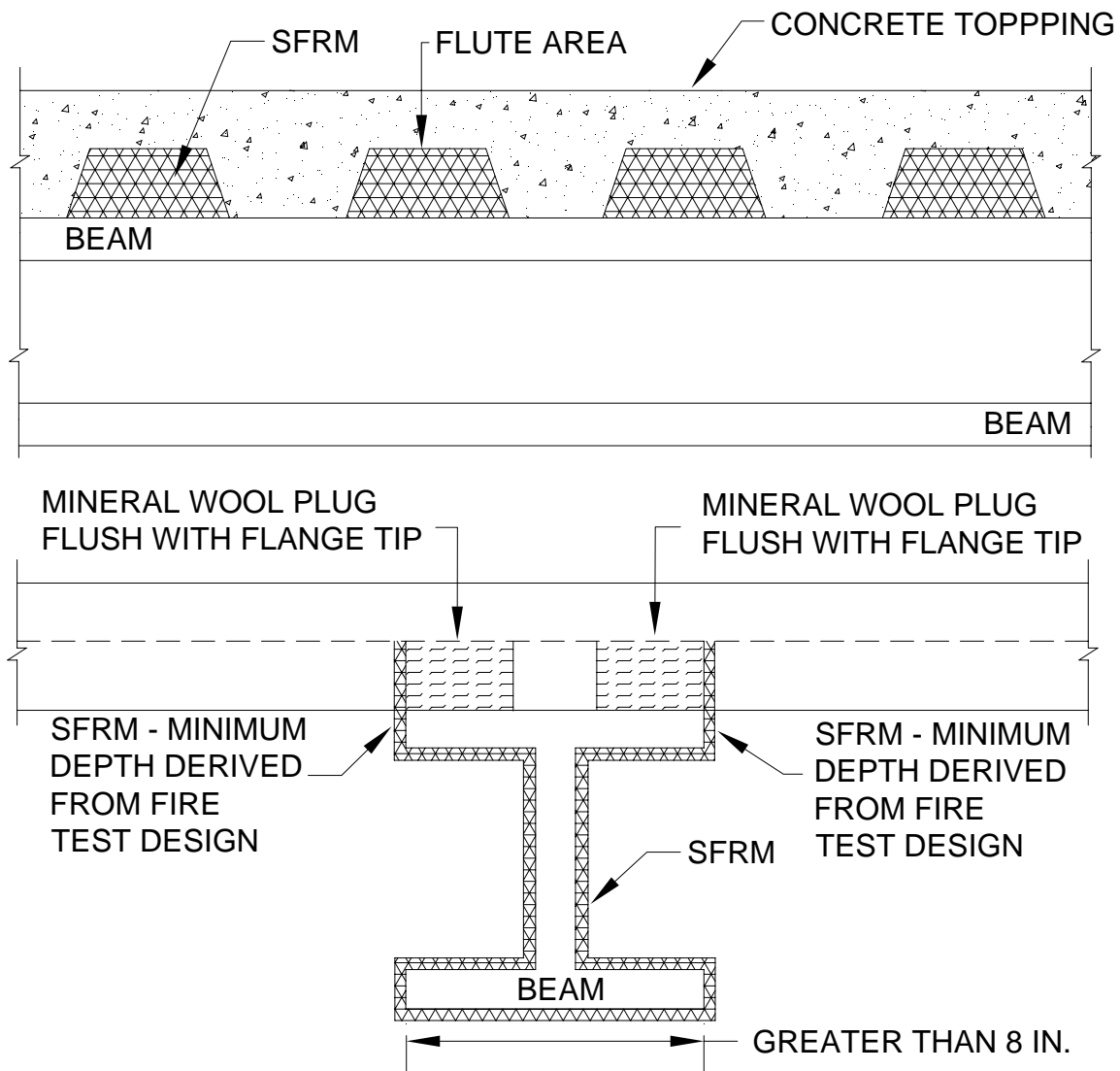
Option A.b.ii : The flute cavity openings above the beam are to be sprayed so as to just close the flute opening above the beam on both sides of the beam with sprayed fire resistive material, leaving a void above the beam. The minimum thickness of the SFRM on the beam and forming the “face” closing openings on both sides of the beam must be **derived from a design consisting of a blend of cellular and fluted, or all cellular units.**

Option A) b.ii.



Option A.b.iii : The flute cavity above the beam is plugged on both sides of the beam with mineral wool cut flush with the flange tips of the beam. There is no minimum depth requirement for the mineral wool plug. On both sides of the beam, the mineral wool plug above the beam is then sprayed with sprayed fire resistive material. The thickness of the SFRM applied to the beam and to the exposed face of the mineral wool plug must be derived from a **design consisting of a blend of cellular and fluted or all cellular units.**

Option A) b.iii.

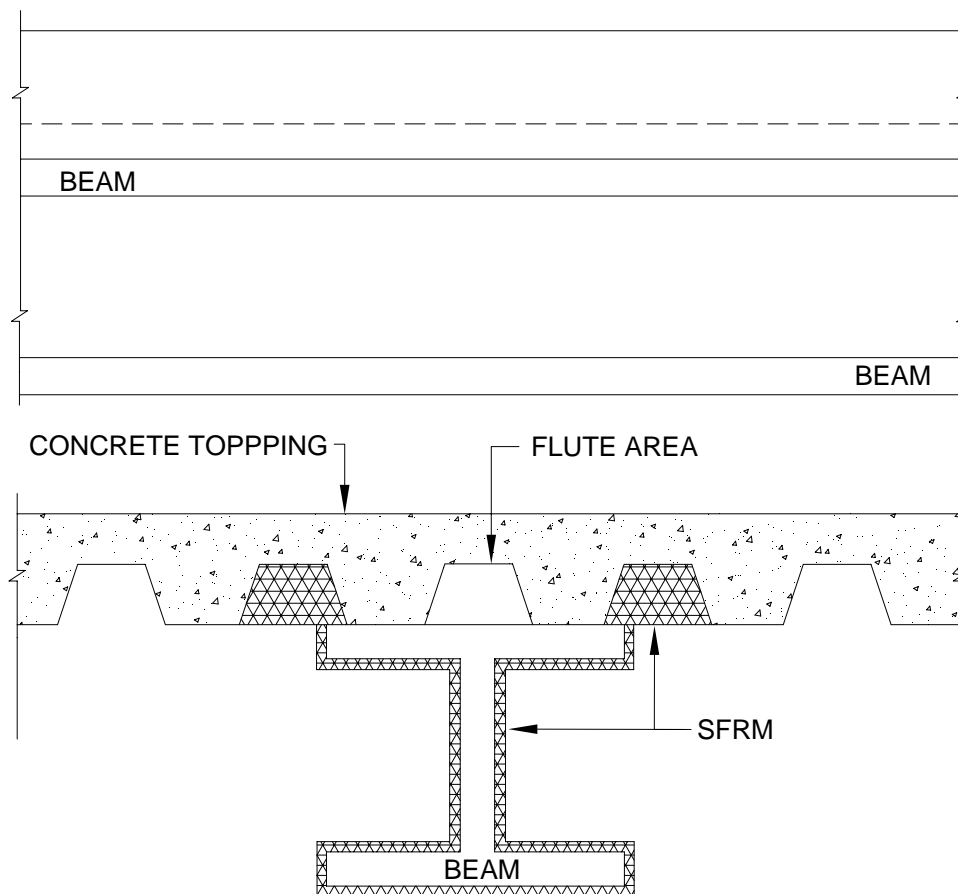


B. Beams running parallel to the flutes of metal decking.

The following options are based on a UL job specific letter² but the basic principals apply to a wider variety of jobsite conditions. Letters on each specific jobsite conditions may be required if UL confirmation is needed.

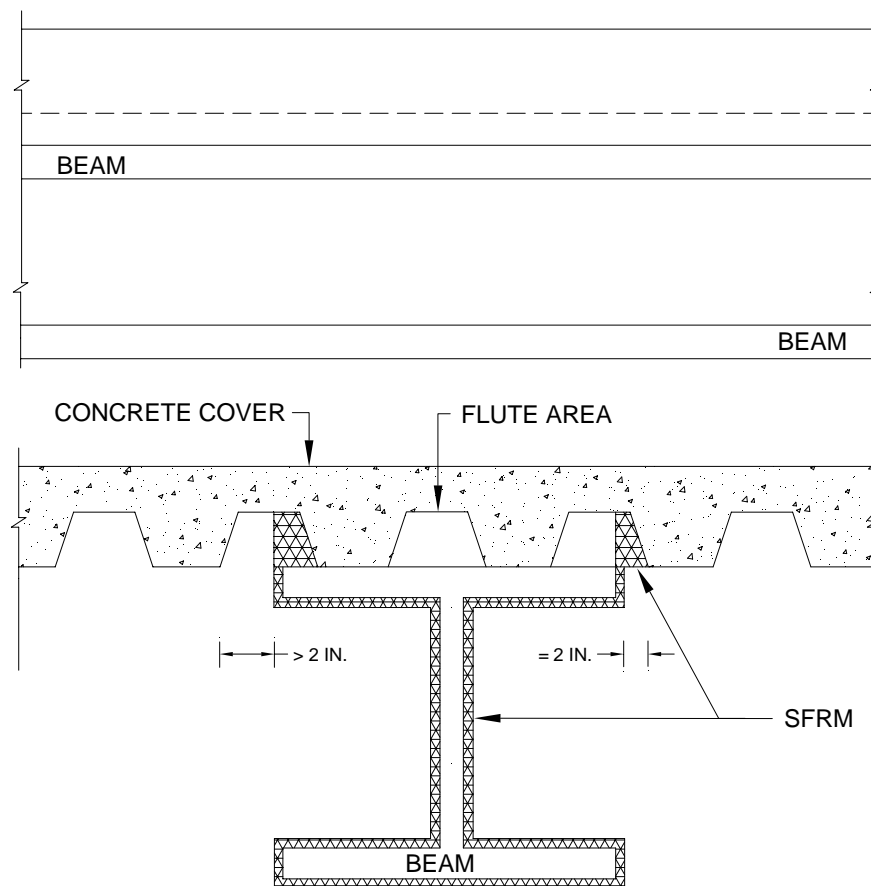
Option B.i : Beams where the topside (except on top flange surface area in direct contact with concrete filled decking) is accessible to be sprayed: The sprayed fire resistive material should be applied to all exposed beam surfaces and the cavity area between the top flange of the beam and the deck shall be filled with the SFRM. The thickness on the beam can be **derived from designs listing only all fluted units.**

Option B) i.



Option B.ii : Beams where the proximity to the adjacent flute prevents sprayed fire resistive material from filling the cavity area above the beam (gap of 2" or less) --see sketch below. Wherever the area above the beam is accessible, the cavity area above the beam should be completely filled with SFRM. Where the proximity prevents complete filling above the beam, (the gap between the beam flange and deck flute is small) the area above the gap, must be filled. It is allowed that a void remain above the top of the beam flange. The thickness of the SFRM must be derived from designs consisting of a blend of cellular and fluted decking or all cellular decking.

Option B) ii.



References:

- ¹ Underwriters Laboratories Inc, letter dated October 19, 2005, Courtesy of W.R Grace and Co.
- ² Underwriters Laboratories Inc, letter dated October 11, 2005, Courtesy of W.R Grace and Co.