



Reginald Derman
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July 16, 2015

RE: BART Life Safety Corp.

Subject: Membrane Design

Dear Mr. Derman,

Global Fire Protection Group has reviewed the documentation provided regarding the use of threaded plastic pipe molds in steel electrical boxes that are to be installed in concrete decking. Received were Figures 1 through 6 showing the installation of the mold in relation to the concrete decking. The concrete floor assembly is to be constructed of either a 4.5-inch concrete on a 2.5-inch metal deck, or a 4.5-inch flat concrete deck, in order to attain a 3-hour rating. The plastic mold is to be removed after curing and a threaded metal conduit is to then be installed in its place. The concern is in relation to the removal of the mold and the need for firestopping of the opening to maintain the rating of the floor. Once the mold is removed, an annular space of approximately 1/8-inch to ¼-inch will exist when the new metal conduit is installed. It is desired to not have firestopping installed within the annular space.

A review of the International Building Code (2015 edition) indicates that through penetrations of fire-resistance rated horizontal assemblies not required to be enclosed in a shaft, such as exists in this case, require firestopping (IBC Section 714.4). Section 714.4.1 has exceptions that can be applied in this case:

1. "Penetrations by steel, ferrous or copper conduits, pipes, tubes or vents or concrete or masonry items through a single fire-resistance-rated floor assembly where the annular space is protected with materials that prevent the passage of flame and hot gasses sufficient to ignite cotton waste when subjected to ASTM E 199 or UL 263 time-temperature fire conditions under a minimum positive pressure differential of .01 inch (2.49 Pa) of water at the location of the penetration for the time period equivalent to the fire-resistance rating of the construction penetrated..."
2. "Penetrations in a single concrete floor by steel, ferrous or copper conduits, pipes, tubes or vents with a maximum 6-inch (152 mm) nominal diameter, provided the concrete, grout or mortar is installed the full thickness of the floor or the thickness required to maintain the fire-resistance rating..."

Further, Section 714.4.2 addresses the penetrations of membranes of horizontal assemblies and requires that these be firestopped. Again, exceptions are provided which can be applied in this case:

1. "Membrane penetrations by steel, ferrous or copper conduits, pipes, tubes or vents, or concrete or masonry items where the annular space is protected in either accordance with Section 714.4.1 or to prevent the free passage of flame and the products of combustion..."

4. Membrane penetrations by listed electrical boxes of any material, provided such boxes have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing. The annular space between the membrane and the box shall not exceed 1/8 inch (3.82 mm) unless listed otherwise."

Based on these exceptions, it is our opinion that the installation of a listed firestop system will not be required. However, the assembly will need to be tested to ASTM E814 "Standard Test Method for Fire Tests of Through-Penetration Fire Stops" and UL 1479, "Standard Method for Fire Tests of Through-Penetrations Fire Stops for final approval.

Should you have any questions regarding this matter, do not hesitate to contact us.

Sincerely,

John D. Campbell, P.E.

JDC

