

THE MAGAZINE OF EFFECTIVE COMPARTMENTATION

# Life Safety

## DIGEST

SPRING 2020

Effective Compartmentation In Educational Occupancies  
Where is FCIA 20 years into the 'DIIM' of Firestopping?  
Fire-Resistance and Fireproofing  
Archaic Assemblies & Fire-Resistance

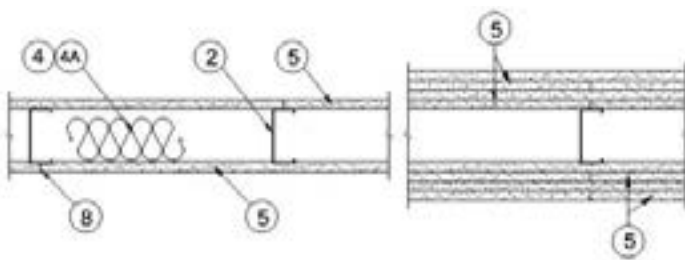


# ARCHAIC ASSEMBLIES & FIRE-RESISTANCE/ FIRESTOPPING

**E**ducation systems throughout the world are a mix of old and new buildings, and combination old/new buildings. In existing buildings, there are tested and listed horizontal floor/ceiling and vertical wall assemblies. These assemblies are listed in directories such as the UL Product iQ database.

Selecting and analyzing wall and horizontal assemblies is like firestop systems. In fire-resistance-rated assemblies used in educational and other occupancies fire-resistance testing exposes the assembly to fire for a specified period of time. There is a temperature rise limit on the side of the wall unexposed to the fire, and a hose stream test administered at test conclusion. The hose stream test is strictly for impact testing after the fire has occurred, simulating ceilings, light fixtures, and other items falling and hitting the wall. A breach of the assembly on the unexposed side constitutes failure of the assembly. The hose stream test is for the wall only. It is also used for the features of fire-resistance such as doors, firestop systems, fire-dampers, and much more. The result of fire-resistance testing is a listing - as shown in Design No. U419, and thousands of other assemblies.

**Design No. U419**  
**September 13, 2019**  
**Nonbearing Wall Ratings – 1, 2, 3 or 4 Hr**  
**(See Items 4 & 5 through 5K)**



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

*UL Listed Wall Assemblies are published in UL's Product iQ Database. Refer to listing for complete information.*

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There are assemblies that have fire-resistance-ratings determined by codes, calculations and other organizations such as the US Housing and Urban Development.

Some assemblies might be known as 'archaic assemblies'. These assemblies might have been declared hourly fire-resistance-rated through testing 75-100 years ago, but are not listed in the UL, FM Approvals [www.ApprovalGuide.com](http://www.ApprovalGuide.com) database, or Intertek Directory.



*FM's ApprovalGuide.com website has firestopping and many other products tested for performance. FM Approvals Image*



*UL's Product iQ website has listings for walls, floors, and those disciplines that protect breaches such as firestop systems, fire doors, fire dampers and more. UL Image*

These assemblies could be concrete, concrete block, clay tile block, gypsum block, lath and plaster, etc.

When firestopping breaches in fire-resistance-rated assemblies at an older educational (or other type) building, a listing cannot be found for the wall or floor that is part of the firestop system. Tested and listed firestop systems typically use concrete block of various thicknesses, gypsum wallboard, combination wood/gypsum floor-ceiling assemblies, or concrete as the assembly material. If the material in the

existing building is made of gypsum block or clay block, there seem to be no tested and listed firestop systems available in the public directories. Therefore, the archaic assembly is not part of a tested and listed firestop system.



*Gypsum Block Assembly, with firestopping.  
C. Zussman, Pepper Constr. Photo*



*Gypsum block and clay tile wall assemblies have fire-resistance-ratings. C. Zussman, Pepper Constr. Photo*



*Clay tile and concrete horizontal assembly. C. Zussman,  
Pepper Constr. Photo*

Because the archaic assembly is not part of a tested and listed firestop system, Engineering Judgements (EJ's) or Equivalent Fire-Resistance- Rated Assemblies (EFRRAs) are required whenever such an assembly is encountered in firestopping. The reason is because there is no listing that encompasses the specific archaic fire-resistance-rated assembly.

## **FCIA'S LEADERSHIP HAS ASKED THE QUESTION, 'WHY IS AN EJ/EFRA' REQUIRED?**

In discussions in early 2019, FCIA's Standards Committee brainstormed key points about how to reduce the number of EJ's using 'Archaic Assemblies' as a possibility. In November, FCIA's Standards Chairs and Board of Directors met with the firestop product manufacturers to see if they would eliminate the requirement for EJ/EFRRAs and sanction the archaic assembly as equal to a listed assembly. We had a good discussion and made some progress, but more research is required on their part. This substitution of a tested and listed assembly for an archaic assembly is not allowed.

## **FURTHER FCIA ANALYSIS**

Many archaic assemblies used in older existing buildings are listed in Chapter 7, section 721 and 722 of the 2018 International Building Code (IBC). Archaic assemblies are also included in the US National Bureau of Standards document BMS92, Fire Resistance of Structural Clay Tile Partitions BMS113, Fire Tests of Brick Walls (Building materials and Structures Report 143) , Fire Resistance of Hollow Load Bearing Wall Tile, and the US Housing and Urban Development (HUD) document, "Guideline on Fire Ratings of Archaic Materials and Assemblies". The fire-resistance-ratings of these assemblies with minimum thicknesses, type of aggregate, etc., are stated in several different documents.

## **FCIA'S REQUEST**

With fire-testing and ratings shown in referenced documents, FCIA's Firestop Contractors have requested that the industry - firestop manufacturers, the testing laboratories, and / or others - conclude about the use of firestopping in these assemblies, without an EJ/EFRA.

We hope the firestop product manufacturers and testing laboratories agree on a formula for firestop installation contractors to use to allow systems tested with fire-resistance-rated gypsum wallboard assemblies to be used on plaster fire-resistance-rated assemblies. This would be only allowed with enough depth of wall to install the firestop products to the assembly tested and listed assembly. Acceptable fastener charts for the various assemblies and devices could be specified by the firestop manufacturer as well.

What about other assemblies? Would gypsum block or clay tile block be treated like a concrete block assembly? There are many documents that a design professional can use to document fire-resistance-ratings. Once documented, the firestop contractor could then select a tested and listed firestop system to maintain the fire-resistance of the assembly at the breach where penetrating item(s) or joint(s) exist - without an EJ/EFRA.

However, we need the firestop manufacturers, testing laboratories, and other authorities familiar with the testing and fire performance of the materials and assemblies, to declare that this is an appropriate practice. From the firestop installation contractor's perspective, once the building owner identifies the substrate and fire-resistance-ratings through their existing Life Safety Drawings, the rating has been declared.



*Concrete block assemblies for walls, shafts, can be found listed in the U900 series designs in the UL Product iQ Database.  
C. Zussman, Pepper Constr. Photo.*

Why try to reduce the number of EJ/EFRRAs required for archaic assemblies? It would reduce the workload on the firestop contractors that adhere to the rules of firestopping. The rules of firestopping dictate that if there's ANY deviation from the tested and listed system, they seek an EJ/EFRA from the firestop product manufacturer. Reducing the number of EJ's takes some load off the manufacturers technical personnel so they can invest in more testing to provide safer buildings through innovations.

For now, FCIA continues to recommend that firestop installation contractors work with their manufacturer partners to come up with the right EJ/EFRA to fit the 'archaic construction'. Rest assured, FCIA's Standards Committee is working on this key topic.

Want to learn more? Check out FCIA's Archaic Assembly Resource area at [FCIA.org](http://FCIA.org), Members Only. 🔥

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