



Routing Utilities in Pre-Insulated Single Wythe Walls



Advantages of Pre-Insulated Concrete Masonry

Pre-insulated masonry wall systems combine Energy Code compliance with the beauty and durability of single wythe wall construction, and low construction cost.

A "single wythe" masonry wall is efficient to build because a single layer of concrete masonry units provide the structural strength, the means for thermal and weather protection, and the interior and exterior finishes in a single construction step! Today's next generation concrete masonry units are attractive and highly efficient from an energy conservation standpoint.

What About Utility Infrastructure?

Designers and builders who are familiar with frame construction often wonder how utilities are routed in single wythe masonry walls since these walls do not require an interior frame or even furring, which often provides a path for conduit. The short answer is that the utilities can readily be routed through the interior of the concrete masonry units themselves even when the wall may be fully grouted. In this design note, we will cover some best practices for how to make this happen.

Pre-Insulated Masonry

While the same concepts apply to conventional concrete masonry construction, we are going to focus on how to add utilities to walls that are both pre-insulated and fully grouted. The units shown in the photographs are Spec-Brik HI-R-H pre-insulated concrete masonry units. They are suitable for construction of double exposed masonry walls in all climate zones.

QUICK POINTS

Single Wythe Walls are highly efficient

Utilities can be routed through the cores of the walls prior to grouting.

The masonry units can be cut to provide access for electrical boxes.

Electrical service boxes should be supported prior to grouting.

Vertical Conduit Placement

Conduit is routed through the cores of the concrete masonry units prior to grouting. There are numerous passageways for vertical conduit because there are large vertical cores formed by the block's webs that are continuous throughout the height of the wall. The units shown have 4 inch thick insulation inserts on the exterior side of the block. The conduit is run through the open space behind the insulation inserts. This area will ultimately be fully grouted.



There is ample room for vertical placement

Horizontal Conduit Placement

As can be seen in this image, horizontal placement of conduit may require some cutting, since the units' reduced web height may not be large enough to accommodate larger diameter conduit. The conduit in the lower image is passing just below where a window sill will be located.



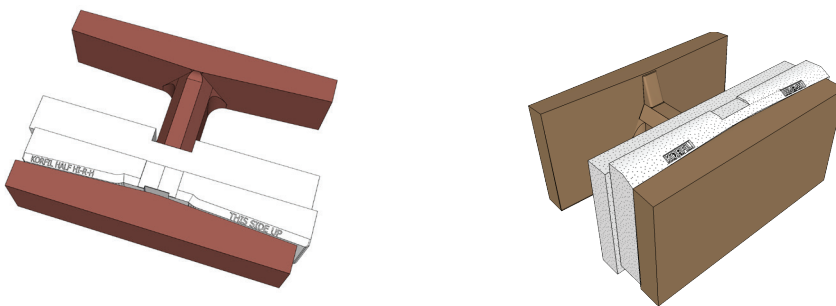
Horizontal placement may require some cuts

Cutting Block to Allow for Electrical Box Placement

Electrical boxes may be placed in the wall face by cutting the masonry units. Some prior planning on the location for the box cuts will pay dividends. The Spec-Brik HI-R-H units have a single web located at the center of the face. It is best to avoid the center of the face as a result. Either end of the unit's face will be an easier area to cut cleanly. Note in the upper picture how the box was located at a center of the face location – to place the cut at that location requires more work. This holds true for either the half or full height HI-R-H units.



Placement at ends is easier



Providing Support for the Electrical Box Prior to Grouting

To assure that the electrical box remains in place during grouting, it is a good idea to place a support beneath the box. Here an expanded steel mesh is used to brace the electrical box prior to grouting.



Before and After

The finished results display the appeal and flexibility of masonry construction.

Mechanical Room with Geothermal System



Bedroom Electrical



Questions?

For more information, visit
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or email your questions to
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