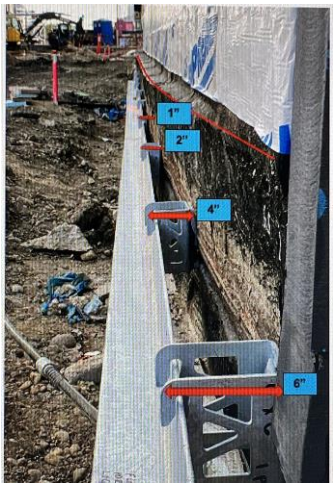
Masonry Tech Brief

Shelf Angles in Masonry Veneer

Shelf angles in masonry are used in mid rise and high rise construction to accommodate vertical expansion of brick veneer. Shelf angles can be anchored to the structural backing behind the veneer using a variety of methods. If steps are not taken to specify a thermal break between veneer and the backing, these shelf angles can contribute to heat loss across the wall, reducing thermal performance. This tech brief will discuss how thermally broken shelf angle systems can solve the problems of movement and vertical support of the veneer, as well as thermal efficiency of the wall assembly.

The Building Code Requirements for Masonry Structures (TMS 402/602 Code) prescriptively requires a continuous horizontal shelf angle in brick veneer 30 feet above the top of the foundation, and subsequent shelf angles at each floor above. The primary purpose of a continuous shelf angle is to provide a soft horizontal joint, giving the brickwork below the shelf angle space to expand. These horizontal expansion joints below each shelf angle help prevent the veneer from cracking that would otherwise occur with restrained movement. Shelf angles and the expansion joints they create help to spread out the vertical movement of the veneer across the height of the wall, rather than forcing all movement to take place at the top of the wall.

Thermally efficient offset shelf angle allows continuous insulation in the wall cavity.



The traditional method of directly anchoring shelf angles to the backing have helped solve the veneer's movement problem, but have introduced a new problem of thermal transfer. Such a large contact area between the steel angle and the CMU or stud backing is an avenue for heat to travel across the wall cavity, counteracting the thermal resistance of the cavity insulation. Continuous insulation (CI) properties are sacrificed when a shelf angle is anchored directly to the backing without a thermal gap.

In recent years, modern shelf angle systems have been developed to separate the shelf angle from the backing system and maintain continuous insulation behind the shelf angle. Shelf angles with proprietary standoff brackets like the FERO™ system, available from Glenwood Mason Supply, simultaneously provide support, accommodate vertical expansion, and preserve the thermal efficiency of the wall.

Offset shelf angles provide a number of benefits. They can be easily shimmed out from the backing wall to ensure the veneer face is straight, plumb, and true, even if the backing is not. The 24" o.c. spacing of the brackets allows for continuous insulation between the brackets and behind the shelf angle. The brackets themselves have a thin profile and can be filled with spray polyurethane foam (SPF) insulation, resulting in nearly uninterrupted insulation in the wall cavity.

Architects today have many options when it comes to supporting masonry veneer with shelf angles. Fortunately, solutions like the FERO™ system available from Glenwood Mason Supply can provide all the benefits of movement accommodation and structural support without sacrificing the thermal properties of the wall.

For more information about thermally efficient shelf angle systems, plant tours, and AIA accredited presentations, call (718) 859-6500, or email **feedback@glenwoodmason.com**

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