



The Masonry & Ceramic Tile Institute of Oregon

503-224-1940

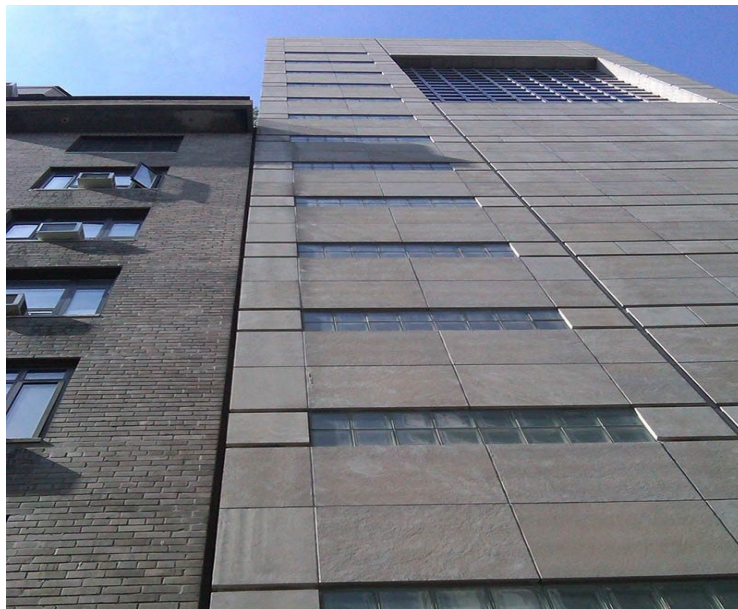
[http:// mlocto.org](http://mlocto.org)

Is it an Expansion Joint or a Control Joint?

All building materials change their size in response to variations of thermal and moisture conditions. If these changes are not addressed the restrained material relieves the stress and this is typically displayed as cracked material. With masonry construction there are typically two different types of joints that are needed to accommodate the movement of the materials, either an expansion or a control joint. The expansion joint used in brickwork is designed to avoid cracking.

Expansion Joints

Brick, a kiln fired clay product, is its smallest size in volume after it is removed from the kiln. The brick expand when moisture is absorbed and this expansion is irreversible. Although the brick is affected by changes in temperature the primary movement is from moisture. These are the reasons to use expansion joints with brickwork.

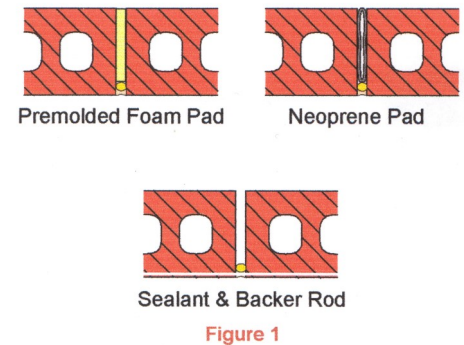
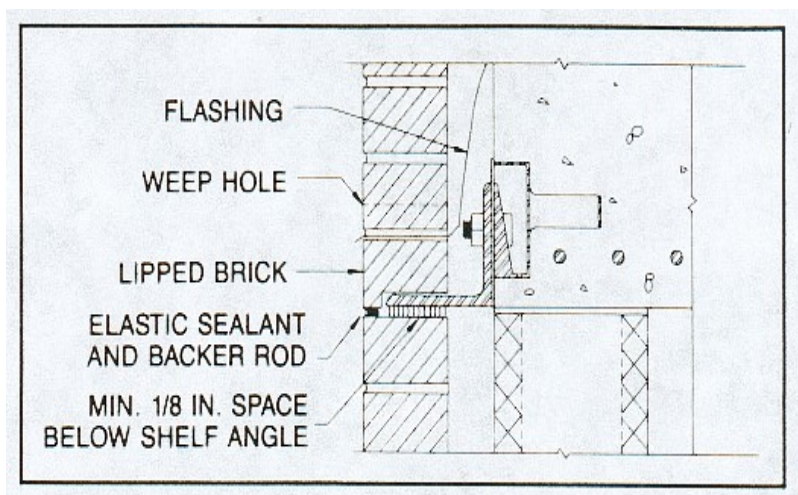


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We will focus on full size brick that is used in anchored veneer in this article. The expansion joints are installed both vertically and horizontally. The vertical expansion joint is formed by creating a continuous, unobstructed space through the width of the brick. Any horizontal reinforcing steel or anchors should not span the opening. The placing of the joints is determined by a myriad of factors. These factors include wall openings, corners and offsets, changes in building heights as well the distances of the unbroken expanse of a wall. The void filled may be with a compressible material that allows the space to shrink as the brick expands. On the exterior side, a flexible sealant is applied to assist in creating a weather resistant joint. The joint size is approximately the same as the width of a mortar joint.

Horizontal joints are placed at the ends of loose lintel angles that are used over the top of openings, as well as shelf angles that are used to support the brick work above the angle. The construction of the horizontal joint at the loose lintel angle iron is to have an unobstructed space at both ends of the angle iron. This space may be filled with a compressible material as well and this will accommodate the thermal expansion of the angle. Once again, a continuous unobstructed space is created between the brick work and below the support shelf angle. In this space a backer rod and a flexible sealant are placed similar to the construction of the vertical joint.

For more detailed information regarding where to place expansion joints and how to construct these joints, the Brick Industry Association has some excellent technical notes on these subjects. Digital versions are available for download at <http://www.gobrick.com>. Technical notes 18 and 18A cover these subjects.



Expansion joints

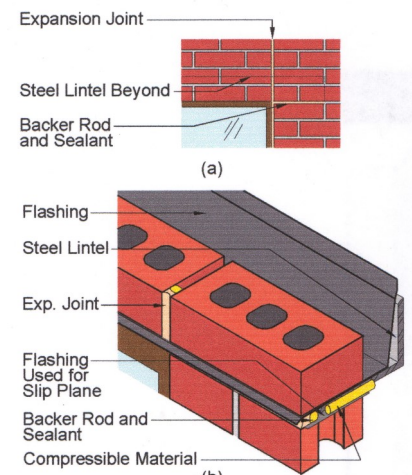
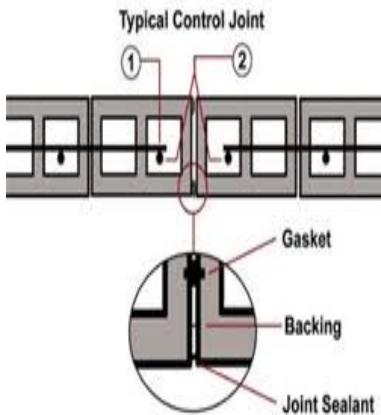


Figure 6
Expansion Joint at Loose Lintel

Control Joints

When the design calls for the use Concrete Masonry Units (CMU), expansion joints, as defined for clay masonry will not work. These cement based products react differently to moisture and thermal changes. The material will expand and shrink with moisture and thermal changes. The control joint is created to control the cracking.



The vertical control joint is formed by creating a continuous, unobstructed space through the width of the CMU. Any horizontal reinforcing steel should not continue through the space, this could restrict movement. An exception is the structural chord steel used at the floor and roof diaphragms. Similar to brick, the placement of the joints is determined by a myriad of factors: corners, openings, changes in wall height and to create panels in large expanses of a wall. In large expanses of a wall an aspect ratio is used to determine the joint spacing. Placed in the joint is a manufactured product specifically designed for use as a control joint. This product is manufactured in either rubber or a special blend of PVC. This product has a shear key that will help transfer lateral loads. A flexible joint sealant is applied to help resist weather penetration. More information on the placement and construction of control joints as well as control joints in CMU veneer is available at <http://nwcma.org>



Control joint product

Understanding the properties of the masonry materials and how each one reacts to their environment will help determine which type of movement joint should be used. Constructing the proper joint creates a durable and aesthetically pleasing project.

References:

Brick Industry Association, Technical notes 18 and 18a (<http://www.gobrick.com>)

Northwest Concrete Masonry Association, Technical note "Control Joints for Concrete Masonry Control" (<http://nwcma.org>)

The Masonry and Ceramic Tile Institute of Oregon assumes no responsibility for the completeness or accuracy of this document.