

# guest column

## Banding with Concrete and Clay Accent Aesthetics Require Special Detailing

Compiled by Dennis Graber and NCMA

Excerpted from NCMA TEK 5-2A Clay and Concrete Masonry Banding Details, 2002

Contrasting bands of concrete masonry in clay masonry veneer or vice versa provide virtually a limitless palette as shown in Figure 1. Bands add architectural interest to the wall and help hide horizontal elements such as flashing and expansion joints. However,

combining these two materials within one wythe of masonry requires special detailing to accommodate anticipated movement resulting from volume changes in masonry materials.

Concrete masonry is a hydraulic cement product requiring water for cement hydration which hardens the concrete. Concrete masonry units (CMU) are relatively wet at the time of manufacture and, from that time on, tend to

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shrink as units dry. Conversely, clay masonry units are very dry subsequent to firing during the manufacturing process and tend to expand as they absorb moisture from the atmosphere and from mortar as they are laid. Without due consideration for these opposing movements, cracking can result. In veneers, cracking is primarily an aesthetic issue. Any water that penetrates the veneer through cracks between the two materials drains down the cavity and is directed out of the wall via flashing and weeps.

When detailing a wall to accommodate the differential movement of the two materials, the design goal is to allow movement to occur (as restraint will cause cracking) while providing appropriate support. In general, several strategies are used. These include vertical movement joints (control joints in concrete masonry and expansion joints in clay masonry), horizontal joint reinforcement resisting tension due to concrete masonry shrinkage helping keep any cracks that occur closed and sometimes horizontal joints which allow longitudinal movement. In veneers, because the two materials move differently, it



Figure 1. Banding provides a wide variety of architectural effects.

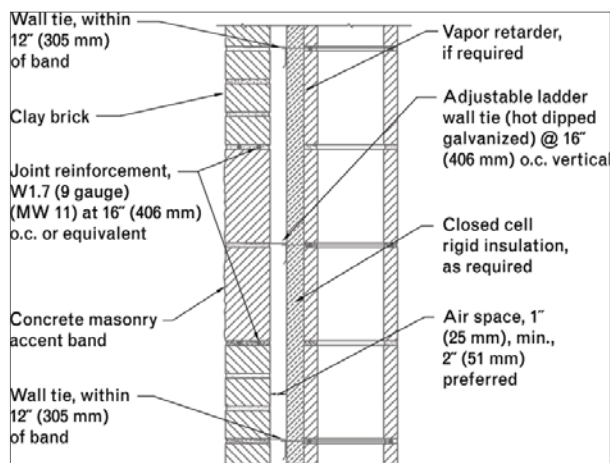


Figure 2a. Multi-course concrete masonry band in clay brick veneer

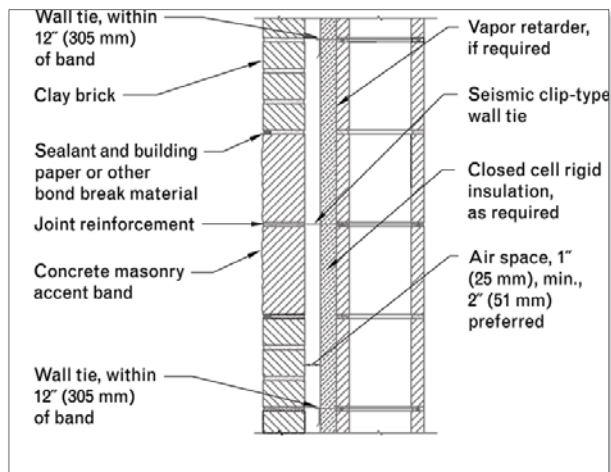


Figure 2b. Multi-course concrete masonry band in clay brick veneer – slip plane option

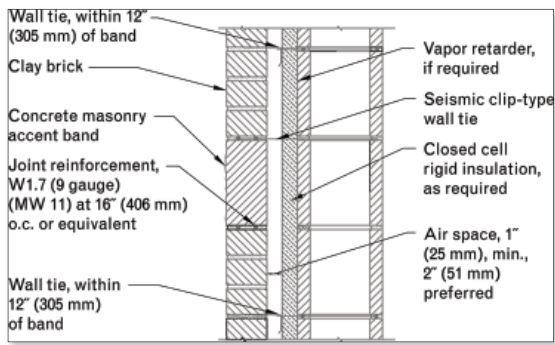


Figure 3. Single-course concrete masonry band in clay

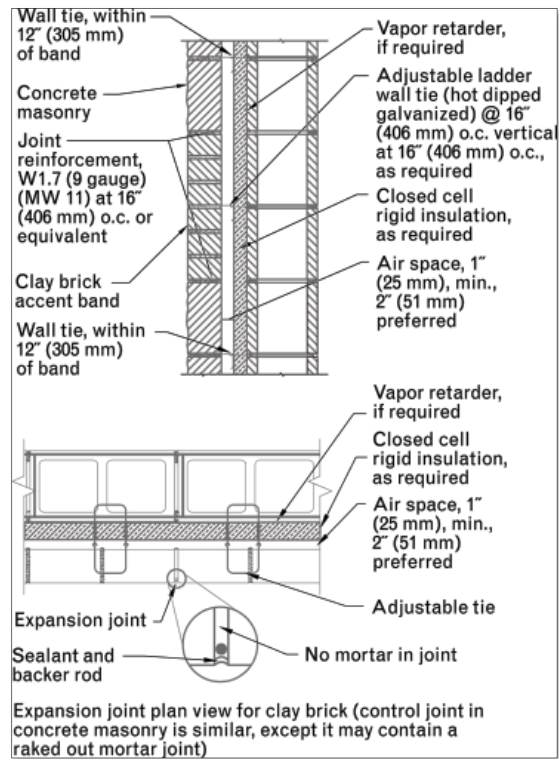


Figure 4. Multi-course clay brick band in concrete masonry veneer

is particularly important that wall ties support the band as well as the wall panel above and below the band.

In addition, using a lower compressive strength mortar helps ensure that if cracks do occur, they occur in the mortar joint rather than through the unit. Type N mortar is often specified for veneers because it tends to be more flexible than other mortar types.

Recommendations are based on a record of successful performance in many locations across the United States. These can be adjusted as needed to suit local conditions and/or experience.

### Concrete Masonry Band in Clay Brick Wall

Figure 2a shows a two-course high concrete masonry band in a clay brick exterior wythe of a cavity wall. With this type of construction, the following practices are employed to minimize potential for cracking.

Horizontal joint reinforcement is placed in mortar joints above and below the band to take stress from the differential movement in that plane. For bands higher than two courses, joint reinforcement should also be placed within the band itself at a spacing of 16 inches (406 mm) on center vertically. Ideally, joint reinforcement and ties should be placed in alternate joints so that one does not interfere with placement of the other. Some case, a tie, which accommodates both tie and wire in the same mortar joint, should be used such as a seismic clip type wall tie.

Although the detail in Figure 2a has demonstrated good performance in many areas of the United States, there are locations where use of bond breaks at the top and bottom of the band is preferred (see Figure 2b). A local masonry industry representative should be contacted for further information on which detail has been more successful in a given location.

Figure 2b shows a slip plane incorporated into the interfaces between the concrete and clay masonry to allow unrestrained longitudinal movement between the two materials. This can be accomplished by placing building paper, polyethylene, flashing or similar material in the horizontal bed joints above and below the band. When hollow masonry units are used for the band, the slip plane below the band should incorporate flashing so that any water draining down the cores of the band can be directed out of the wall at that point.

When slip planes are used, joint reinforcement should be incorporated into the concrete masonry band. The exposed mortar joint at the top and bottom of the band should be raked back and sealed with an appropriate sealant to prevent water penetration at these joints. Note that this construction is typically more expensive than the detail shown in Figure 2a.

In addition to joint reinforcement, reduced spacing of expansion joints in the wall is recommended to reduce the potential for cracking. Experience has shown that vertical expansion joints in designers, however, prefer placing joint reinforcement in every bed joint in the concrete masonry band, particularly if the band is relatively narrow. In this clay masonry should extend through

the concrete masonry band as well and be placed at a maximum of 20 feet (6.1 m) along the length of the wall. Although concrete masonry construction typically requires control joints rather than expansion joints, control joints should not be used in the concrete masonry band at expansion joint locations.

Note that local experience may require reducing expansion joint spacing to 16 feet (4.9 m). If brick vertical expansion joint spacing exceeds 20 feet (6.1 m), consider placing an additional vertical movement joint through

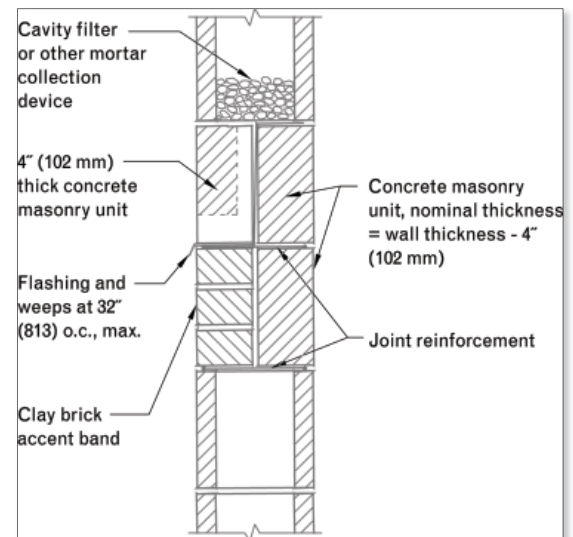


Figure 5a. Multi-course clay brick band in unreinforced concrete masonry single wythe

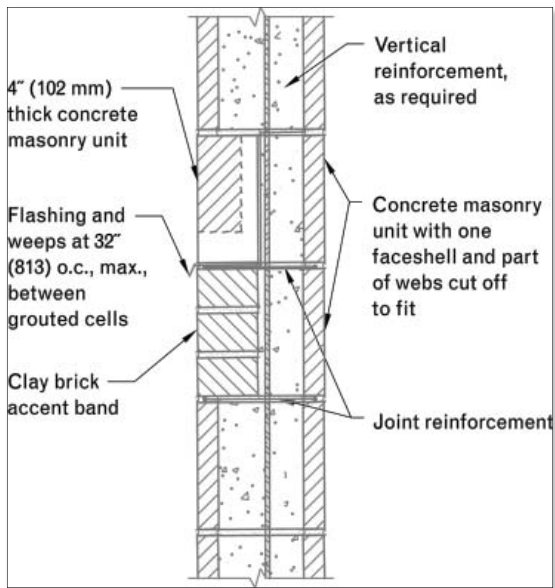


Figure 5b. Multi-course clay brick band in reinforced concrete masonry single wythe wall.

movement while resisting lateral or out-of-plane shear loads, veneers are laterally supported by the backup and do not require a shear key.

In single wythe construction as shown in Figure 5a, flashing and weep holes are used above the accent band to facilitate removal of any water that may accumulate in the wall. The use of two reduced thickness concrete masonry units allows flashing to be placed within the wall without causing a complete horizontal bond break at the flashing.

In reinforced walls (Figure 5b), flashing and weeps are also used. On the wall interior, rather than using reduced thickness units, a full size unit is cut to fit to allow adequate space for the reinforcement and grout. ■

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Graber used excerpts from NCMA TEK 5-2A Clay and Concrete Masonry Banding Details, 2002. More complete information on banding and crack control can be found in TEK 5-2A and other NCMA TEK. NCMA TEK are now available online at sponsoring NCMA member sites. [www.ncma.org](http://www.ncma.org).

the concrete masonry accent band near mid-panel with joint reinforcement continuous through that joint. The continuous joint reinforcement in this location helps keep clay brick above and below the band from cracking as the concrete masonry shrinks.

Bands only one course high must be detailed to incorporate joint reinforcement and wall ties in joints above and below the band (see Figure 3).

When concrete masonry banding is used over a wood stud backup, these provisions apply as well. Regardless of the backup system or the type of banding detail used, it is imperative that joint reinforcement be used in the concrete masonry band, even if it is not used in the surrounding clay brick masonry.

### Clay Brick Band in Concrete Masonry Wall

Recommendations to control differential movement for clay brick masonry bands in concrete masonry are very similar to those for a concrete masonry band in clay brick veneer – joint reinforcement above and below the band and wall ties within the band. Seismic clip-type wall ties are recommended, as they provide an adjustable wall tie and joint reinforcement in one assembly.

In this type of construction, it is imperative that the veneer control joint not contain mortar as it goes through the clay brick band (see Figure 4). Mortar in this joint will restrict brick expansion, reducing the movement joint's effectiveness. Note that although control joints in structural masonry walls must permit free longitudinal

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