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Brick Technical Bulletin - Use of Marshalls Bricks with Dissimilar Materials

BTB 12

It is recognised that a large proportion of building materials, especially masonry walling products, can have different characteristics stemming from their basic raw materials, manufacturing methods, properties and performance, and although these products all fulfil the functions required of them, the designer and end user should be aware of the differing properties and the effect on the final building.

A prime example is that of concrete and clay bricks. Both products expand and contract in response to thermal movement but clay bricks suffer an irreversible expansion after manufacture due to adsorption of moisture from the atmosphere. That expansion can vary depending on the type of clay and the firing method.

By contrast, concrete has a tendency to shrink during drying and expand back to its original size when wetted. It should be noted that the drying shrinkage and moisture movement of concrete masonry can vary from the extremes of aerated concrete @ 0.09% to that of Marshalls bricks @ 0.02-0.03%. These values themselves can influence the frequency and position of movement joints.

However, there are instances where Marshalls bricks and clay bricks are to be used together and in these cases it is important that steps are taken to accommodate the differential movement that may occur.

1. If either type of brick is used below dpc and another type built off it, eg. Marshalls bricks below dpc and clay bricks above it, then the dpc may act as a slip plane and allow some amount of lateral movement between the two products. Below dpc, because the Marshalls brick is likely to be in a semi-damp location, then it may not be necessary to incorporate movement joints at the recommended intervals as the likelihood of shrinkage and hence the risk of differential movement is small.

2. If the clay brick is used below dpc and the Marshalls brick built off it then normal incorporation of movement joints in the superstructure should be sufficient to accommodate the differential movement.

3. **Feature Panels:** These may be located where either clay or concrete bricks are incorporated as feature bricks surrounded by an alternative product. In these instances provision should be made in the form of horizontal dpcs to act as slip planes both above and below the panels. Vertical joints should be installed at the edges. In all cases the number and position of wall ties should be adjusted to ensure structural stability. An Engineer's opinion should be sought to verify the design.

4. **Splash Courses:** These can be examples where bricks are built up off the dpc for a number of metres or even up to the height of the wall head at ground floor level. Again, slip courses may be introduced to allow for differential movement between any different materials. If the Marshalls bricks are built at the base level then it is likely that the dead weight and superimposed load of the masonry above those brick courses may be sufficient to restrain the brickwork to the extent that it may be possible to minimise the frequency and distance that movement joints are required. This depends on the type of masonry unit that is built on top of the brickwork.

5. Should rendered aggregate concrete blockwork be built on top of concrete facing work then any movement joints incorporated into the blockwork should be followed through the brickwork courses below.

6. Where there is an element of doubt or suitability regarding the efficiency of a slip plane then an alternative action of incorporatingbed-joint reinforcement into the structure should be considered .This will have the effect of dissipating internal stresses and controlling the differential movement.