

## DESIGN & SPECIFICATION CONSIDERATIONS

# PREMATURE FAILURE OF BRICKWORK DUE TO MOVEMENT

Many free standing and retaining walls may fail prematurely due to the lack of provision for movement.

Even if the correct durability level of clay bricks are used, (F2 – Severe Exposure) inadequate provision for movement occurring over the expected life of the structure can lead to a chain reaction of events that will ultimately lead to frost failure. This is not a fault in the product but a lack of design consideration.

### THERMAL MOVEMENT IN BRICKWORK

Many factors dictate how much brickwork will move due to temperature changes. The orientation and geographical location of a wall will be a major influence, also, the brick type and the strength of the mortar. Each unit will expand when heated by the sun and over a short distance the total movement may be insignificant. Over longer distances something will have to take the strain, preferably an easily compressible joint.

In boundary walling, unlike larger structures, there is not the mass of brickwork to restrict thermal movement. Therefore movement joints (often referred to as expansion joints) must be provided at a maximum of 5 to 6 metre spacing with a maximum of 2.5 – 3 metres from a corner or change of direction. They must commence at foundation level and continue through the coping or capping courses.

**The capping course is more prone to expansion and contraction compared to the rest of the walling as temperature fluctuation will be greater and there is far less restraint. It is therefore important to increase the allowance for movement in the coping or capping course therefore additional mid-point movement joints will be required every 2.5 – 3 metres.**

Fibre boards or hemp boards similar to those used in concrete construction must not be used for brickwork movement joints. Purpose made foam rubbers are the most commonly available from builder's merchants, together with suitable high quality sealant.

It is wrongly assumed that laying an Engineering Brick as a capping along the top of the wall eliminates the need for a proprietary brand of high bond damp proof membrane. Water will percolate through cracks in the mortar/brick interface. The DPC must be at least the full width of the wall and sandwiched within the mortar joint.

Code of Practice requirements are for a strong designation (i) mortar in coping and capping courses but the stronger the mortar, the more brittle it is and the more likely to crack. Mortars should never be stronger than the bricks used.

### PINCHING EFFECT

Lack of provision for movement will result in a 'pinching' effect to the capping, this is first observed when minor chipping starts to occur at the edges of the bricks next to the mortar and often leads to early failure.

Sometimes damage to the bed joint and the perpend joints can also be seen. In rare cases, where the bricks cannot move due to restraint at either end, the capping may lift clear of the wall on which it was set.



Pinching effect



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