

Application & construction RAIN PENETRATION OF BRICKWORK WALLS

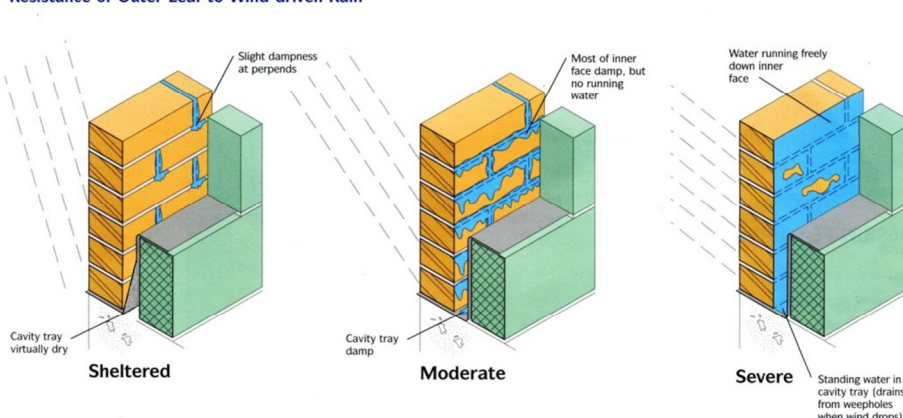
The outer leaf of masonry construction is not watertight!

Since approximately 1930 house construction changed from predominantly solid wall structures to cavity walls. Solid walls, by the nature of masonry, would allow moisture to eventually percolate through and cause dampness especially in areas of the country subject to severe exposure to wind driven rain.

The change to cavity wall construction allowed water, finding its way through the outer leaf, to run freely down the inside of the outer leaf and be re-directed outwards via weep-holes further down the wall.

Many instances of water penetration problems appear after heavy rainfall soon after completion of a dwelling. Often the first thought is that 'the bricks are leaking' and they must be faulty.

Resistance of Outer Leaf to Wind-driven Rain



During long periods of wind-driven rainfall, the brickwork becomes saturated directing excess water down the outer face. Mortar, often being more porous than the masonry unit or prone to hairline cracking, will absorb large volumes of water which then enter the cavity.

When it comes to specifying one of the many types of bricks available, NO distinction should be made as to which is best for the purpose of keeping water out because the weakness in a brick wall is the interface between the brick and the mortar joint. For this reason, it is important to ensure that a good quality of workmanship is employed at all times.

The bond between brick and mortar is very important.

Mortar acts as a 'glue' and space filler. It makes up about 17% of the area of the brickwork and careful gauging of the sand/cement is needed. The correct designation of mortar should be specified according to durability requirements and masonry unit being used. If the mix is cement rich, the structure is less flexible to thermal and moisture movement and cracks can form. Cracks provide a speedy route for water to penetrate into the cavity. This is worsened if the bricks haven't been laid on a full bed of mortar with fully filled perpend joints! Too little cement, however, makes the mortar even more porous.

REASONS WHY WATER MAY BRIDGE THE CAVITY

It is likely that water will enter the cavity. This wasn't so much of a problem in earlier years of cavity wall construction, but cavities are now being used as the easiest way to fulfil more stringent insulation regulations and extreme care must be taken during the construction of cavity walling if it is going to be shared with materials that can breach the gap. It could, in effect, act as a bridge for water to cross to the inner leaf.

Cavity insulation-

Current Building Regulations demand a cavity at least 50mm wide. If cavity insulation is intended, ideally provision should be made to maintain this as a free space. 'Batts' of insulation material are fixed to the inner leaf and if they come adrift and stick out slightly during construction, any debris falling onto them bridges the cavity creating a path for water to cross.

