

## SITE PRACTICE AND TROUBLESHOOTING

# EXPANSIVE PARTICLES



Expanded lime particle.

### WHAT ARE EXPANSIVE PARTICLES?

They are small fragments of naturally occurring material, expansive in nature, of a size large enough to cause disruption to the surface of a brick when it expands slightly with the adsorption of moisture.

### CAUSE & EFFECT

The presence of potentially expansive particles in clay deposits containing compounds such as Gypsum, Siderite and Lime, is quite common in the brick industry. Occurrence is usually controlled during factory processes as the particles are either ground too finely during clay preparation to cause problems, eliminated during firing, or are situated well beneath the surface of the brick where they are quite harmless. Occasionally, due to a combination of factors, small particles can be deposited on or near the surface of the brick face.

After firing, when the brick absorbs moisture, a chemical reaction takes place. The particles swell which, if close enough to the surface may cause portions of the brick face to “pop” off.

The results are small pits in the surface of the brick with a white (lime) or purple (siderite) spot in the centre.

This is not uncommon. It is strictly an aesthetic issue and will not affect the structural integrity of the brick. It is only the loss of a small portion of the surface of the brick and the exposure of the differing body colour underneath which causes concern.

‘Surface blows’ usually occur during construction due to hydration, or in the first few months of the life of the brick once it has come into contact with moisture, whether in the form of rain or general atmospheric damp conditions. It is unlikely to continue to develop for much longer after the occurrence has been noticed.

The appearance of brickwork is not covered in BS EN 771-1 since it is not performance related. However, BSI have published PAS 70, A Publicly Available Specification which is intended to cover aspects of aesthetics.

The PAS includes the recommendations that all brickwork should be viewed from approximately 3 metres away. Appearance of brickwork will vary significantly with the type of clay brick chosen. NHBC guidelines suggest 10m as a viewing distance and also suggest the size of expansive particles or chips is limited to 15mm in diameter.

### REMEDIATION

To overcome the aesthetic issue, the following remedial treatment can be performed;

The expanded particle is drilled out to provide a more substantial key for a filling material. The depression is then filled with a suitable material, such as a compound of a cementitious/resin nature, which is coloured to closely match the original brick colour and additions of various sands etc. are used to provide a similar texture.

The filler is then cured and if any further work is required to more closely resemble the brick surface this is then done. The whole surface of the brick including the filled area is then tinted to blend in with existing brickwork.

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