

Firecracking – Fissures in Clay Brickwork

Bricks are produced by a number of manufacturing processes. The main two are wire cut or extruded bricks which make up the majority, or the more highly prized soft mud or “Stock” brick. While cracks or fissures can occur in either brick type they are more likely to be found in Stock bricks.

Some of the bricks which are currently most highly prized by designers are bricks which are misshapen or curved with cracks and fissures, as these give an instant patina of interest and detail to an elevation. They also declare that the brick is hand crafted and original, not part of a homogenised factory product produced in large numbers.

An individually crafted product is not a required aesthetic for all specifiers, but these can impart texture and interest. Clay bricks are commonly made oversized by around 10% depending on the clay body. The brick then undergoes a two-part process – firstly drying; a soft mud brick can contain up to a pint of water which must be driven off

gradually until the brick is dry enough to enter the kiln. If the bricks are not dried properly before firing, the moisture present can expand, turn to vapour, and cause the clay brick to fail in the kiln.

When the dried brick is fired, vitrification occurs, (depending on the clay type, between 950°C commonly, up to around 1050°C) altering the platelets into a durable and robust material. The nature of the clay has been changed by the kiln. In construction uses the brick is now durable and has the potential for lasting for thousands of years.

The parts of the brick most able to resist the effects of the weather are the outside which has experienced the hottest part of the fire. The cracks in the face of the bricks are therefore highly fired and generally durable.

The fissures or cracks are formed by the clay shrinking in the kiln and thereby separating in the same way as in baking. Fissures are generally the mark of a brick which has been

fired to a high temperature and consequently will be both durable, and weather satisfactorily. It is true that it would be undesirable that a fissure would extend more than 30mm into a brick but with a standard brick of 102.5mm, this still allows 70mm of clay body to protect the cavity and so this is not a concern.



If the distance is greater than 20mm the brick should be cut out and replaced, or alternatively, filled in situ with a colour matching epoxy and finished with a colour matching sand. Well done, this should be invisible especially when viewed from the correct distance of 3M or 10ft as required by Publicly Available Specification 70. As cut and bond bricks account for over 2 out of 3 specials currently in production, there should be no concern over the use of this technology.

The NHBC suggests that reviews of brickwork should be carried out from 10M with the advice that cracks should not be; 'Significant'. The wall should be examined as a whole – individual bricks should not be closely examined.

If the fissure is narrow, (less than 2mm) then the forces generated by freeze, thaw and expanding moisture lodged in the cracks is insignificant. It will not cause the cracks to grow worse when built into a cavity wall and protected by mortar above and below, especially as one side of a crack will be open, permitting expansion. If the crack is greater than 3mm this could generate greater

forces and although generally unlikely to degenerate in use, it may be prudent to consider an epoxy matching filler in this case.

The inclusion of small firecracking as described above will not be detrimental to the façade performance or durability. They will not increase in size or lead to failure.

With all durability advice, the exposure and location should be considered. A solution in central London or a sheltered location will not be appropriate for a free-standing wall in Derbyshire, so this advice does require consideration of both exposure and location, and the brick should have been selected with that in mind. In fact, some natural bricks which do have fissures are also particularly good at weathering in severe exposure locations and we will be glad to advise on this issue.

It is understood in the industry that bricks which fail a visual inspection should be put aside by the contractor or bricklayer and not built in to the wall. This is normal good practice, and the bricks which are clearly damaged in transport, storage or site handling should be rejected as part of the

contractors QI process.

If cracking occurs in a straight line on a number of brick faces, this is not firecracking and may indicate a structural issue which needs investigation. This is not related to firecracking.

Bricks can give interest to a façade, and bricks with cracks, fissures and a particular character may produce a fantastic elevation. An individual brick is a crafted product and the cracks and fissures may well be indicative of a durable, highly prized and interesting product.