TECHNICAL INFORMATION A19

Ibstock Brick

DESIGN & SPECIFICATION CONSIDERATIONS
DE-ICING SALTS AND MASONRY

The European Standard for use of masonry, EN 1996-2, sets out 'micro conditions' of masonry in order for Specifiers to consider appropriate construction materials for specific applications.

This document highlights considerations required when designing structures that may be subjected to micro condition **MX4- Masonry exposed to de-icing salts or masonry adjacent to roads or pavements that are salted during the winter.**

Table A.1 in EN 1996-2

CLASS	MICRO CONDITION OF THE MASONRY	EXAMPLES OF MASONRY IN THIS CONDITION
MX1	In a dry environment	Interior of buildings for normal habitation and for offices, including the inner leaf of external cavity walls not likely to become damp. Rendered masonry in exterior walls, not exposed to moderate or severe driving rain, and isolated from damp in adjacent masonry or materials.
MX2	Exposed to moisture or wetting	
MX2.1	Exposed to moisture but not exposed to freeze/thaw cycling or external sources of significant levels of sulfates or aggressive chemicals	Internal masonry exposed to high levels of water vapour, such as in a laundry. Masonry exterior walls sheltered by overhanging eaves or coping, not exposed to severe driving rain or frost. Masonry below frost zone in well drained nonaggressive soil.
MX2.2	Exposed to severe wetting but not exposed to freeze/tha cycling or external sources of significant levels of sulfates or aggressive chemicals	Masonry not exposed to frost or aggressive chemicals, located: in exterior walls with cappings or flush eaves; in parapets; in freestanding walls; in the ground; under water.
MX3	Exposed to wetting plus freeze/thaw cycling	
MX3.1	Exposed to moisture or wetting and freeze/thaw cycling but not exposed to external sources of significant levels of sulfates or aggressive chemicals	Masonry as class **MX2.1** exposed to freeze/thaw cycling.
MX3.2	Exposed to severe wetting and freeze/thaw cycling but not exposed to external sources of significant levels of sulfates or aggressive chemicals	Masonry as class **MX2.2** exposed to freeze/thaw cycling.
MX4	Exposed to saturated salt air, seawater or de-icing salts	**Masonry in a coastal area. Masonry adjacent to roads that are salted during the winter.**
MX5	In an aggressive chemical environment	Masonry in contact with natural soils or filled ground or groundwater, where wmoisture and significant levels of sulfates are present. Masonry in contact with highly acidic soils, contaminated ground or groundwater. Masonry near industrial areas where aggressive chemicals are airborne.

NOTE In deciding the exposure of masonry the effect of applied finishes and protective claddings should be taken into consideration.

EFFLORESCENCE AND CRYPTOFLORESCENCE

CAUSE

Active soluble salts can be found in many materials including Portland cement, sea salt, fertilisers, road salt, and acid gases from various atmospheric pollutants, as well as in soil and ground water. However de-icing salts have been found to be problematic when used as part of a regular maintenance routine, particularly around public buildings and schools where large quantities of salts are spread by manual or mechanical means onto exterior walkways adjacent to masonry.

The pore structure in masonry will absorb water where varying quantities and types of salts may be dissolved. As masonry dries the moisture will evaporate at the face leaving crystallised salts known as efflorescence. These types of deposits are normally relatively harmless. Crystallisation of salts within the pore structure below the masonry surface is known as cryptoflorescence.

The key factors causing problems to arise from active soluble salts are the presence of a sufficient quantity of water soluble salt and prolonged damp conditions.

For further information or advice regarding this topic please contact
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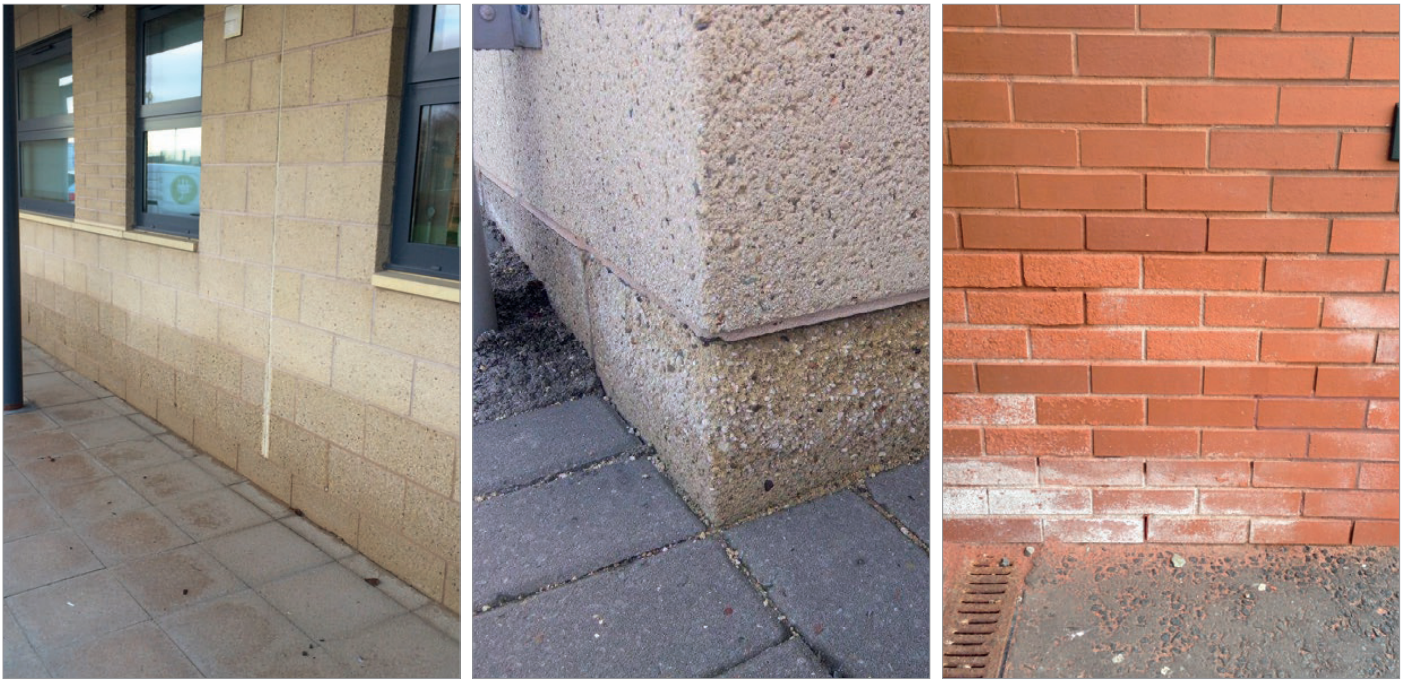
EFFECT

Increasing accumulation of crystallised material under the surface in zones subjected to prolonged damp conditions can force apart the pore structure of some masonry materials and care should be taken when specifying products for these areas. This type of crystallisation may damage the surface of the masonry product due to continued expansion of the crystals over time with continued supply of salts and moisture.

Most masonry can be susceptible to the effects of cryptoflorecence, from natural stone to reconstituted stone and clay and concrete brick.

Lime containing compounds, such as mortar or reconstituted stone may be affected chemically, clay bricks are generally affected if the surface has been coated with a sealant or anti-graffiti application affecting breathability and the passage of moisture, although excessive



The effect of regular de-icing salts on masonry materials near pavement level.

SOLUTION

If de-icing salts are to be regularly used around a building, masonry from foundation to 1m above ground level should be of a material resistant to the build- up of salts. Consult the masonry manufacturer for their recommended products.

Do not apply any coatings to masonry in an attempt to protect it from the harmful effect of de-icing salts as soluble material can enter from ground level and be drawn up by capillary action.

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