



Durability of Clay Brickwork

The Right Brick for the job...

This 'Get it Right' will help you choose a brick that will fulfil its function. Durability is defined as 'capable of lasting - resisting wear'. External claddings are expected to meet these criteria and brickwork is no exception.

Clay Brick Types

Facing - Sold for its appearance - available in a wide range of facing brick types colours and textures. Some may not be suitable in positions of extreme exposure. Some have engineering properties.

Engineering - Suitable for ground works manholes and sewers, retaining walls, as a ground level dpc to free-standing walls and situations where high strength and low water absorption are the most important factors.

Not sold for their appearance.

Remember - Brickwork is not intended to be waterproof and should be allowed to breathe. Each brick type will absorb a certain amount of water before shedding it, however it must be appreciated that water absorption is not directly related to durability. Frost and sulphate attack can only occur when brickwork is saturated.

Frost Attack: The repeated action of rain - water freezing and subsequently thawing in saturated brickwork can cause spalling of the brick surface. This will not happen with **F quality** (Frost resistant) bricks. (See also use the right brick for the job).



Sulphate Attack: In saturated brickwork soluble salts from certain types of brick (**N rated**) may cause a chemical reaction with the Portland cement in the mortar. The surface of the mortar joint may crack, and the inside crumble and expand, disrupting the brickwork. Where bricks of normal salt content (**N**) are used, and high levels of water are expected, then sulphate resisting cement should be used in the mortar.



Use the Right Brick for the Job!

All clay bricks have a Durability Designation rating and it is important to know which bricks to use and where.

Bricks produced in the UK fall into three categories of frost resistance:

F - Frost resistant

M - Moderately frost resistant

O - Not frost resistant

Note: They do not look any different so ask your supplier for the rating. If bricks are not rated they should be assumed to be "O" not frost resistant.

F rated bricks can be used in all normal building situations and degrees of exposure.

M rated bricks are also durable except where they may remain saturated and are subjected to repeated freezing and thawing. Generally they can be used between dpc and eaves although caution should be exercised on sites in elevated, exposed locations.

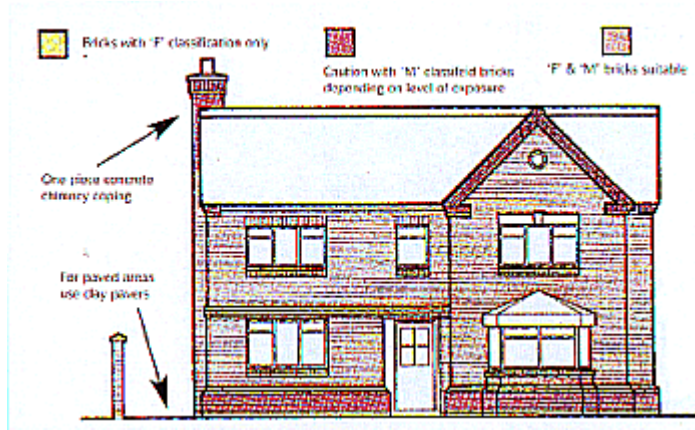
Do not use M rated bricks:

- Below ground level dpc.
- For cills.
- For copings/cappings.
- Beneath cappings.
- For projecting details - i.e. plinths.
- In exposed site locations.

O rated bricks should not be used externally.

Mortars

Remember - Mortar joints are vulnerable

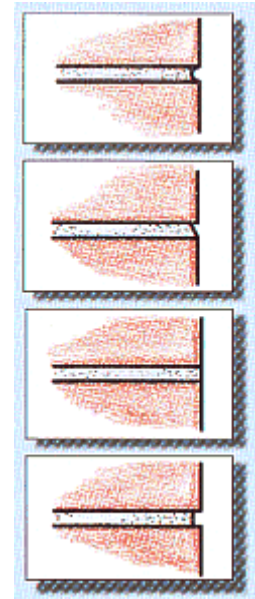


Mortar is an essential ingredient of brickwork and is subject to the same exposure as the brick; unfortunately it is not often given the same degree of consideration as the brick. Generally mortar mix 3 will be sufficient for the majority of brickwork undertaken. For free-standing walls, brickwork below ground level dpc and chimneys, mortar mix 2 will be stronger and more durable in the wetter locations. Consider mortar mix 1 for use below ground level dpc and for copings/cappings and chimneys in very wet locations. Good workmanship and a thoroughly mixed mortar will contribute to durable construction.

Mix 1	Mix 2	Mix 3
1 part Portland Cement	1 part Portland Cement	1 part Portland Cement
1/4 part lime	1/2 part lime	1 part lime
3 parts sand	4 1/2 parts sand	6 parts sand

Mortar joint Profiles

Remember the long-term performance of the brickwork is highly dependent on the correct mortar joint profile for efficient shedding of rainwater. Brickwork that remains saturated is more susceptible to frost damage. The choice of joint profile should therefore be based on performance criteria, as well as aesthetic considerations. These are the four most commonly used profiles.



• Curved Recessed (Bucket Handle)

An efficient joint with a softer appearance.

• Weather Struck

An efficient and attractive joint giving the shadow effect of a recessed profile but better weathering properties.

• Flush

A common profile that is efficient in terms of shedding water if tooled, but will alter dramatically the overall colour of the brickwork.

• Squared Recessed

Very attractive profile - not generally recommended for free-standing walls or any exposed situations.

Depth of recess should be kept to the minimum necessary to achieve the desired appearance, but should not be any greater than 6mm.

Note: Recessed joints should not be used where there is a danger of excessive wetting.

Vulnerable Brickwork

Cills and Plinths

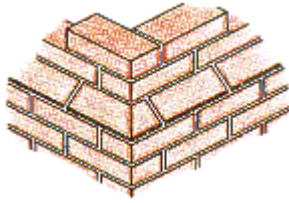
Remember cills to window openings and projecting plinth brickwork, are subject to greater exposure from rainfall than vertical walling - they will become saturated!



Cills



Use an F rated special shaped brick i.e. a single cant, plinth or cill brick to construct a cill, which will shed the water run-off from the glazing, protecting the brickwork below. Cills should project to give the necessary protection if M rated bricks are used below.



Plinths

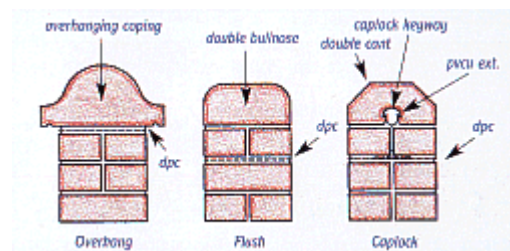
Any projecting plinth brickwork must also be F rated. Because of its position it is more exposed and in addition will receive water run-off.

Copings and Cappings

Remember - Use a coping or capping to protect the brickwork below.

A coping to the top of a wall is the preferred finish; they include an overhang with drip groove that will help direct the water to fall clear of the brickwork below.

Cappings are generally flush with the walling. In all instances they must be F rated and used in conjunction with a high bond dpc which will help protect the walling below from saturation.



Effective copings and cappings can be achieved using special shaped bricks.

Workmanship

Remember that good workmanship is of the utmost importance for long term durability.

- Do not build in freezing or excessively wet conditions.
- Cover unfinished or newly built brickwork each night to prevent saturation and staining.
- Use the correct mortar specification for the application.

