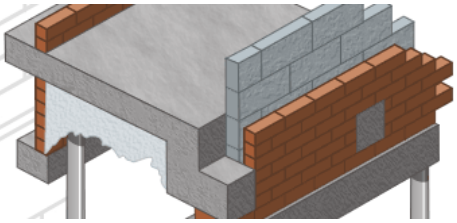
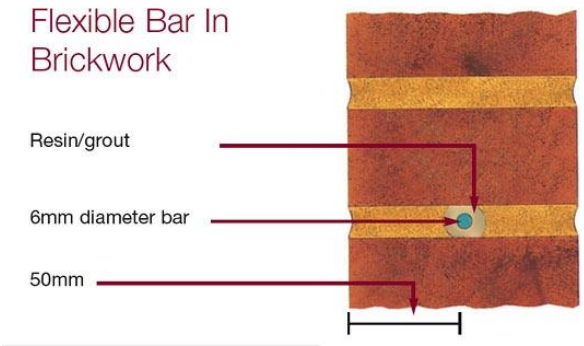


Brick & Masonry Reinforcement

DESCRIPTION

Introducing steel reinforcement into masonry has the effect of producing a composite structure with some of the capabilities of reinforced concrete. Correctly specified and installed, the reinforcement will allow the masonry to withstand tensile forces and non linear compressive loads.

The technique is most commonly used in the subsidence market to 're stitch' fractured brickwork. Subsequently the structure will not only regain its previous load carrying capacity but will have the ability to spread stress concentrations through the reinforcement away from the area of weakness.



In the case of structures suffering from differential foundation movement, installing reinforcement strategically into the brickwork, the building will have an increased ability to withstand possible minor future seasonal movements and significantly reduce the risk of future structural cracking in the repaired areas.

In general the reinforcement used is helical twisted stainless steel bar with diameters between 4mm and 8mm. Larger 10mm diameter bar is generally used for anchoring and tying.

NOTE: Masonry reinforcement cannot prevent foundation movement.

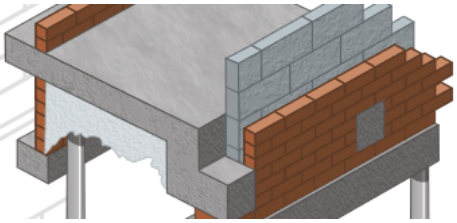
Reinforcement can be 'built' into brick and masonry at the time of construction increasing the wall or arch's tensile capacity ie. low retaining walls or openings.

TECHNIQUE

The art of brick reinforcement installation is to create as little disturbance in the brickwork as possible. Often brickwork is old and bedded on weak lime mortars. Standard traditional techniques of brick stitching can cause increased de-bonding in the surrounding brickwork. By using vacuum recovery, low vibration, diamond bladed wall chasers accurate slots to specific set depths in brickwork mortar beds can be made without damaging the bricks.

Generally for installation of a single helical bar the depth of the chase will be 45mm. The bed-joint should be chased out and cleaned of all mortar to the specified depth, vacuumed and then washed with clean water. A 10mm bead of thixotropic cementitious grout is then injected into the slot and pressed home with a finger trowel.

The helical bar is then inserted along the slot and gently pressed into the grout. A second bead is then injected over the bar and the finger trowel used again to compress the grout and ensure full encapsulation of the bar and adherence to the brick above and below. The resultant grout surface should be approximately 20mm below the surface.



Brick & Masonry Reinforcement

The bed joint can then be re-pointed in colour matched mortar.

For simple crack repair the length of bar should be a minimum of 0.5m either side of the fracture.

For more complex installations the manufacturers design details should be followed.

ADVANTAGES AND DISADVANTAGES

The main advantages of brick and masonry reinforcement are:

- Enhances the strength of masonry.
- Very low impact both physically and aesthetically.
- Works well with brickwork constructed with cement and lime mortars.
- Very cost effective in the long term.
- Can be used to carry out a wide variety of repairs and strengthening.

Disadvantages of this system include:

- It requires additional training and skills for the operatives.
- It adds costs to repairs.

HEALTH AND SAFETY

Briefly, the main health and safety considerations are:

- Dust infiltration from the drilling.
- Working at height
- COSHH issues of handling the chemicals.
- Electrical shock from power tools.

For detailed Health and Safety information, see ASUCplus 'Guidelines on safe and efficient underpinning and mini-piling operations'