PINNING MASONRY ARCHES

SECTION 04

Pinning masonry arches with helical reinforcement rods is a highly effective way of repairing and strengthening old brick or stone arched structures. Installation of the heavy duty helical ties maintains arching-action, restrains thrust and prevents failing arches from collapsing.

A masonry arch is used to span an opening and transfer the weight above into a horizontal thrust. The thrust is restrained by abutments on either side of the arch. Old arches may fail due to tension developing in the arch, causing separation of arch layers or movement of the key-stones. Early signs of failure become apparent when the arch begins to sag or crack. This cracking and displacement failure is potentially dangerous and may lead to total collapse of the arch.

In order to maintain arching action and prevent the arch from collapsing, the thrust at the base of the arch needs to be restrained. The restraint may be provided with the introduction of masonry ties, or with external bracing. If tension develops in the arch, reinforcing ties may be added to resist the tension forces and to reconnect separated arch-layers or keystones. Pinning masonry arches to the brickwork or stonework above can increase the effective depth and load capacity of the arch.

Thor Helical have two systems for reinforcing failed masonry arches.

Chemical Fix Grout Tie for strengthening brick & stone arches

The strength of brick arches can be restored by using helical bars, fully grouted into deep bores drilled into the masonry. Holes are typically 14-18mm in diameter. Cement-based grout is pumped to the holes and a helical tie bar inserted into the unset grout. The continuous deep trough of the helix provides an excellent key for locking the tie bar in place once the grout cures and sets.

Mechanical Fix Strap Tie for pinning masonry arches

Masonry arches can be reinforced using a heavy duty self-tapping helical tie rod driven deep into the masonry. A small pilot hole, typically 8mm in diameter, is drilled into the masonry and a 12mm heavy duty tie rod is hammer-driven into the undersized pilot hole. The helical strapping tie corkscrews into brick and stone, cutting a self-tapping thread, to provide a high strength mechanical connection.

WHAT MAKES THE THOR HELICAL 12MM TIE A CUT ABOVE THE REST?

- No bonding agents required.
- Suitable for use in situations where cement grouts cause material compatibility issues.
- Can be used in freezing temperatures.
- Suitable for pinning masonry arches at high speed, typical installation rates are 10 times faster than for chemical fix tie bars.
- Small entry hole for minimal disfigurement of masonry.
- Patented precise pitch engineering delivers a helix consistency with unrivaled performance.
- Patented pinning system with unique tie-driving shank.
- Safe, reliable, easy to use and low cost SDS setting tool (patent pending).
- Thor Helical 12mm mechanical CD ties conform to conditions for CE marking according to BS EN 845-1 2013 and meet the requirements National Annex NA for having a tensile load capacity of at least 8kN.