

TRAC
Structural Ltd

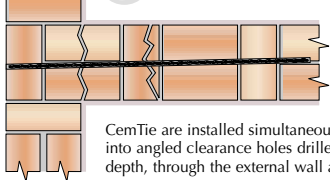


Helibeam Masonry Repair System

The unique Helibeam System of stress free structural reinforcement and repair is at the heart of Helifix advanced remedial strategies. It provides a rapid, versatile, cost-effective means of restoring structural integrity to buildings and structures where the masonry has cracked or failed and lost its load bearing capabilities as a result of ground movement, weathering or increased loads and stresses.

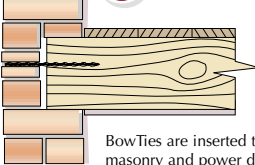
The Helibeam System uses Hi-Fin profile helical stainless steel HeliBars bonded into cut slots (normally the mortar beds) to produce horizontal stress-free bed-joint reinforcement. The HeliBars tie the masonry together and create deep masonry beams which distribute the structural loads. In combination with other Helifix ties and fixings, designed for lateral and vertical restraint, it provides a comprehensive, non-disruptive, economic system of structural repair and stabilisation applicable to all commonly used construction materials and types of masonry structure.

1 RECONNECTING PARTY WALLS WITH EXTERNAL WALLS



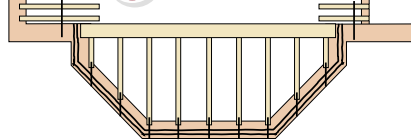
CemTie are installed simultaneously with HeliBond grout into angled clearance holes drilled, to the required depth, through the external wall and into the party wall.

2 STABILISING BOWED WALLS INTO JOIST ENDS



BowTies are inserted through a clearance hole in the masonry and power driven directly into the joist end before bonding with PolyPlus resin into the masonry.

3 REPAIR OF BAY WINDOWS



Twin HeliBars are bonded into a predetermined cut slot around the bay above the window with the ends embedded in the front elevation. BowTies are driven into the joist ends via clearance holes in the masonry and low level cracks are stitched with single HeliBars.

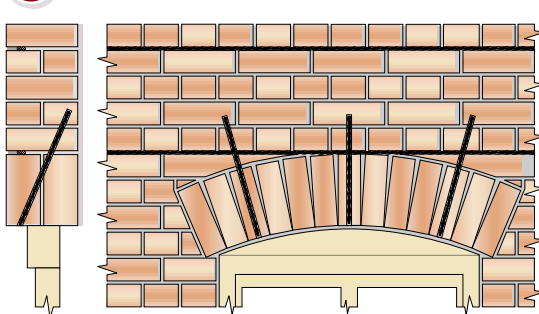
4 REPAIRING SEPARATED MASONRY

CemTies and HeliBond grout are installed into clearance holes drilled through the near leaf and at least 75mm into the far leaf. The density of the ties will depend upon the degree of separation, the material, the causes of the problem and the overall condition of the masonry.

5 RECONNECTING INTERNAL WALLS WITH EXTERNAL WALLS

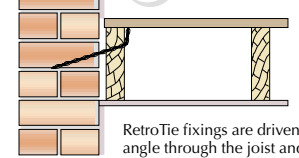
Predetermined slots on the internal wall are channelled out to the specified length right into the corner. 10mm diameter holes are drilled at an angle from the corner into the external wall. Single lengths of HeliBar are bent to shape with the angled end being PolyPlus resin bonded into the hole and the remainder HeliBond grouted into the internal wall.

6 REPAIRING BRICK ARCH LINTELS



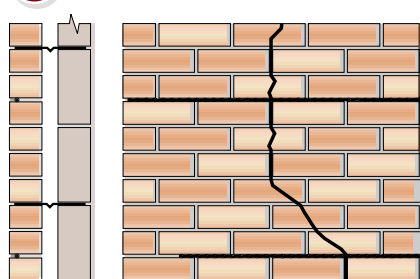
Parallel lengths of HeliBar rod are bonded into the specified slot, cut directly above the existing lintel. Angled CemTies or DryFix ties are installed through the lintel into the masonry above the lower HeliBars, and finished with matching pointing.

13 CEILING JOIST PINNING



RetroTie fixings are driven at an angle through the joist and into the masonry, via a small pilot hole, and the projecting end is hammered over.

7 REPAIRING CRACKS NEAR CORNERS AND OPENINGS

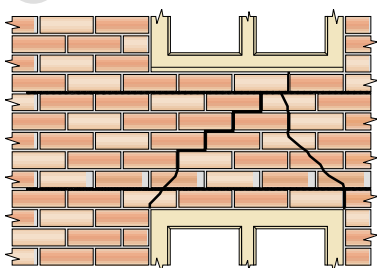


Where cracks are less than 500mm from an external corner or 100mm should be bent round the corner and bonded into the masonry, fixed into the reveal, avoiding any DPC membrane, and finished with matching pointing.

12 REPLACING CAVITY WALL TIES

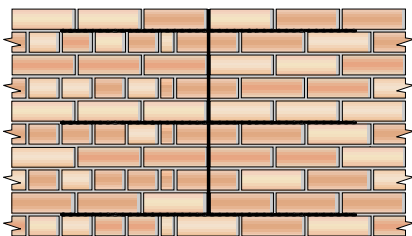
DryFix wall ties are power driven directly into both leaves, via a small pilot hole around 6mm diameter. RetroTies are driven into a 4.5mm pilot hole in the far leaf, via a clearance hole in the near leaf into which they are bonded with PolyPlus resin. ResiTies are resin bonded into a 10mm hole in both leaves.

11 REPAIRING OR CREATING FLAT ARCH LINTELS



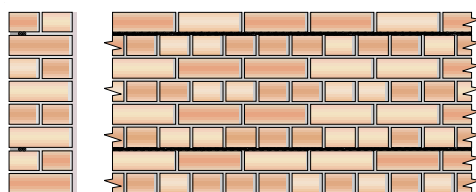
Parallel lengths of HeliBar rod are bonded into the specified slots, cut above the existing lintel, and finished with matching pointing.

10 CRACK STITCHING



Lengths of HeliBar rod extending 500mm either side of the crack are bonded into cut slots, normally the mortar beds, with HeliBond or PolyPlus resin, and finished with matching pointing.

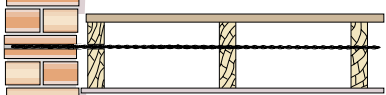
9 CREATING MASONRY BEAMS



The HeliBeam System uses parallel lengths of HeliBar reinforcing rod bonded into predetermined cut slots (normally the mortar beds) with HeliBond grout to form deep masonry beams which distribute the building loads.

- shows a beam resisting the horizontal displacement of a bowing wall. Due to the internal stairwell BowTies cannot be used as there are no joists at this point.
- shows a beam resisting vertical loads to prevent building subsidence.

8 STABILISING BOWED WALLS INTO JOIST SIDES



BowTie HD's are inserted through clearance holes in the masonry and first joist and power driven directly into the second and/or third joist before being bonded into the masonry with PolyPlus resin.

BowTie & BowTie HD

2 3 8

A long series tie for restraining bowed walls, BowTie is available in standard and heavy duty versions. Installed through a clearance hole in the masonry, BowTie is driven into the floor joists end (normally standard version) or through the first parallel joist and into the second or third joist (HD version) before being resin bonded into the masonry where it is fully concealed. Installed externally BowTie is a fast and effective way of stabilising bulging walls while causing minimal disturbance to the building fabric or the occupants.

CemenTie

CemenTie is used where the far leaf uses a thin wall hollow block that is unable to provide adequate embedment. A sock sleeve, fitted to a grout gun nozzle, is inserted through a clearance hole and into the hollow block where it is inflated with grout. The CemenTie is then inserted through the hole and into the sleeve and bonded into the outer masonry. In buildings over four storeys high CemenTies, grouted into both leaves, are used to ensure compliance with fire regulations.

CemTie

1 4 5

A versatile tie with numerous applications, CemTie is a grouted tie used for tying together solid masonry; solid and rubble filled walls; multi layer brick ring arches; separated internal and external building walls; delaminated masonry; parapets, cornices and decorative fascias. A grout gun with a long nozzle, into which the CemTie is inserted, is put to the back of a clearance hole and, as the HeliBond cementitious grout is pumped, the CemTie is expelled leaving a fully grouted tie. A quick, clean and cost-effective means of stabilising masonry, CemTies are ideal for solid masonry and working overhead.

DryFix

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DryFix is probably the quickest, easiest and simplest remedial tying and pinning system available and therefore extremely economical. Loaded into a special power-driver attachment, DryFix is rapidly driven through the near leaf and into the far leaf, via a small pilot hole, for a secure and reliable connection. It requires no grouts, resins or mechanical expansion and leaves the building virtually unmarked. It is used as a replacement wall tie, for securing multiple layers of masonry and pinning delicate masonry features.

HeliBar

3 6 7 9 10 11

HeliBar helical reinforcing bars, bonded into masonry with HeliBond cementitious grout, have a variety of applications. In 1m lengths they are used for fast, effective, permanent and concealed crack stitching that is more reliable than simple crack injection methods. Commonly used in long lengths to create masonry beams which stabilise the structure and distribute the loads. Well suited to resolving lintel and ground movement problems.

ResiTie

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A replacement wall tie for situations requiring resin bonding at both ends of the tie, ResiTie is recommended for small jobs needing 200 ties or less.

RetroTie

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A versatile replacement wall tie, RetroTie has a mechanical fix in the far leaf, which can be easily proof tested, and is resin bonded into the near leaf. Fully proven, RetroTie has great axial strength and has been used extensively and successfully in all common building materials as well as regional materials and PRC housing.

Masonry Arch Bridge Repairs

The stabilisation and installation techniques developed by Helifix minimise the disruption to road and rail services. They avoid the need for expensive re-building as the repair products combine with, and conserve, the existing fabric. This makes them ideal for stabilising historic and listed structures which are left visibly unimpaired with no unsightly external plates or restraints.

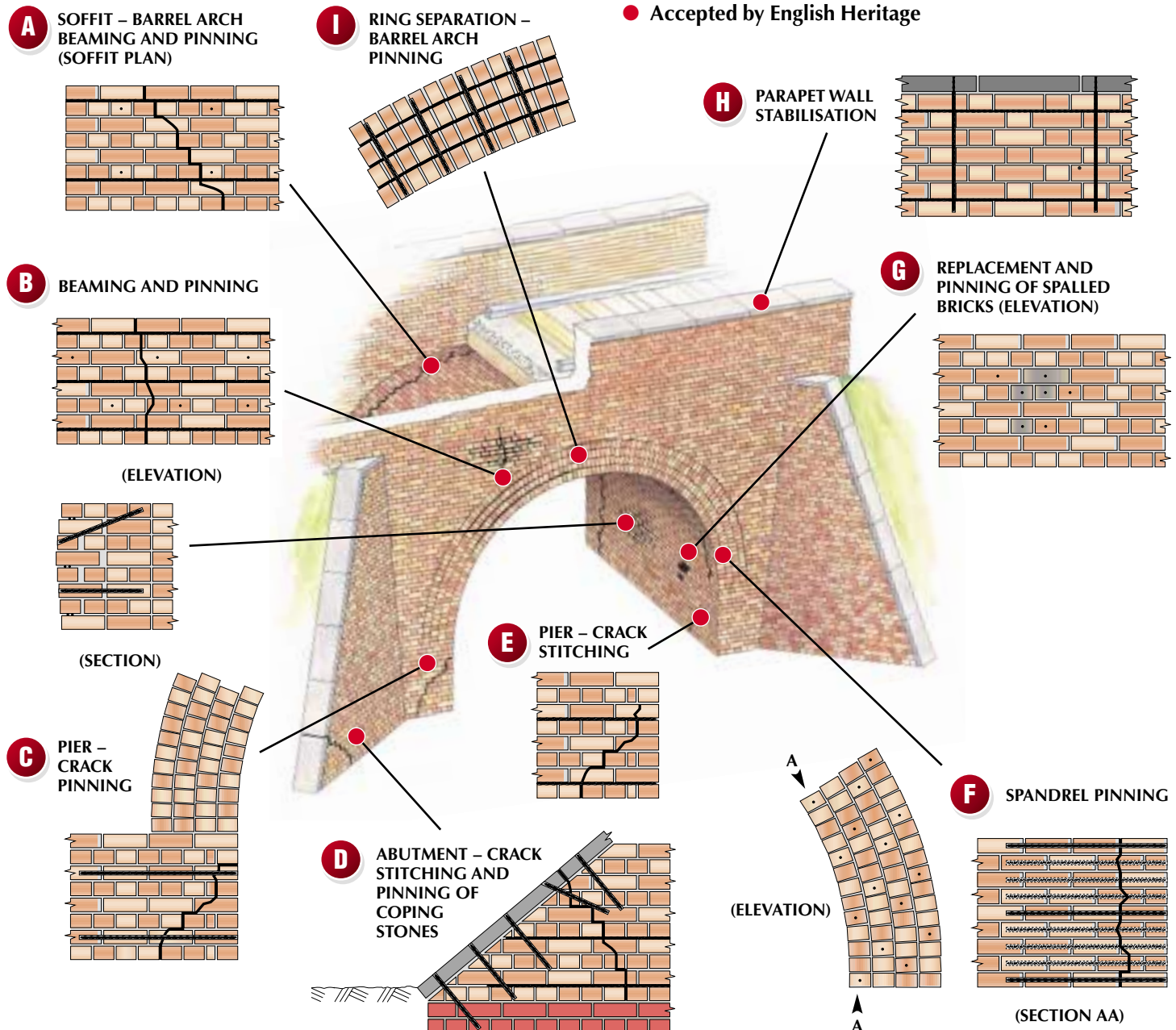
These innovative tying, bonding and repair techniques use appropriate product combinations to produce concealed sympathetic solutions for most situations where masonry has cracked or failed, such as:

- Movement in the spandrel wall
- Separation of arch rings
- Cracking in the arch barrel
- Delaminated masonry
- Spreading barrels and soffits
- Cracked abutments and wing walls

Each project requires its own specific repair strategy, based on the type and severity of the particular structural problems. This normally involves the HeliBeam System being used in combination with other special application products to produce a comprehensive repair. These principally include HeliBar reinforcing rods, CemTies, to secure separated brick rings and stabilise solid walls, and DryFix for rapid masonry pinning and tying.

Benefits of the HeliBeam System

- Minimal disruption to road, rail or water services
- Rapid stress-free installation
- Cost-effective
- Totally concealed for sympathetic repairs
- Minimum disruption to host fabric
- No additional stresses introduced
- Ideal for historic and listed structures
- Accepted by English Heritage



TRAC

Structural Ltd



TRAC Structural Ltd was formed in June 1998 to provide a complete design and installation structural repair service for professional, private and contract customers throughout the south and west of England and Wales. Most areas are serviced from the Bristol office while an additional installation team based in Cornwall ensures a good service to the south west peninsula.

TRAC Structural offers a comprehensive service, including full surveys, designed repairs and high quality installation. Its operatives are trained in specialist skills such as diamond drilling, rope access and abseil techniques, enabling structural integrity to be restored to all forms of masonry buildings, bridges and retaining walls.

TRAC Structural is well established as an experienced specialist contractor with considerable expertise in a wide range of repair techniques and an extensive catalogue of completed projects, both large and small, for a very wide range of customers.

Helifix Approved Installer

Proud to be registered as a Helifix Approved Installer, in recognition of the dedicated structural repair services they provide, TRAC Structural utilises the full range of well proven, fully concealed, Helifix repair products which are particularly suited to historic and listed structures. Many projects have been successfully completed ranging from private houses to multi storey car parks, tower blocks to bridges and churches, and include works to such prominent buildings as Gloucester Cathedral, Ludlow Castle, Pembroke Clock Tower, Brunel's Accumulator Tower and other scheduled ancient monuments and listed buildings.

The Helibeam System®

At the heart of Helifix remedial strategies is the unique Helibeam System of structural reinforcement and repair using helical, stainless steel bars bonded into the masonry. It provides a rapid, cost-effective means of restoring structural integrity to buildings and structures where the masonry has failed and lost its load bearing capabilities. In combination with other Helifix ties and fixings it provides a comprehensive, reliable and economic system of repair and stabilisation for most commonly occurring structural faults.



How it works

Where masonry has cracked and failed, as a result of ground movement, weathering and increased loads and stresses, the Helibeam System provides stress-free horizontal bed-joint reinforcement by tying the masonry together and creating deep masonry beams which distribute the structural loads. Other ties and fixings provide appropriate lateral and vertical restraint to complete the System which has been proven in all types of masonry structures.



Benefits

- Effectively restores structural stability at reduced cost
- Deep masonry beams support and distribute structural loads
- No further stresses introduced
- Flexibility accommodates normal structural movement
- Rapid, reliable and economical means of crack stitching
- Economical alternative to rebuilding
- Efficient and non-disruptive lintel repair/creation
- Greatly simplifies window replacement programmes
- Avoids expensive and disruptive taking down and rebuilding
- Sympathetic and non-disruptive means of repair
- Equally effective on all masonry structures

Case Studies

Glebe Bridge, Stanton St Quinton, Wiltshire



Structural deterioration of this road bridge had resulted in various faults including bulging of a spandrel wall resulting in its separation from the bridge barrel. Masonry throughout the brick arch barrel was suffering from various cracking and was in a generally poor condition and ineffectual earlier repairs had been undertaken.

Working for Wiltshire County Council and their consultants, Ringway Parkman, TRAC Structural installed the Helibeam System of masonry repair and reinforcement from Helifix. The lengths of stainless steel HeliBar were bonded into the channelled out mortar beds throughout the barrel and returned round the spandrel walls to effectively stitch the cracks, secure and reinforce the masonry and hold the structure together. Eight ground anchors were also installed through the bulging spandrel wall to ensure no further movement.

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Multi-storey car park, Newport, Gwent

TRAC Structural carried out an external structural boroscope survey, using rope access techniques, for project engineers Stirling Maynard Construction Consultants who were undertaking a complete inspection of Park Square multi-storey car park for Newport City Council. The survey revealed concerns about the condition of the existing wall ties and whether sufficient support was being provided, for the brick cladding panels, by the nibs at each floor level on the concrete frame.

TRAC carried out the necessary remedial work, to Stirling Maynard's specification, using a repair programme designed by Helifix engineers. Working from a suspended cradle, TRAC installed both DryFix and ResiTie stainless steel remedial ties in a triangular arrangement. This provided a truss-like action that ensured both vertical and lateral restraint for the brick panels. In addition, some limited crack stitching of the brickwork was also carried out. No taking down and rebuilding was required and the project was completed rapidly and efficiently, the cladding was reliably secured and the car park was able to remain open throughout.

