



helical

systems

Cost Effective Masonry Repair Structural Overpinning Solutions

GroundScrew Underpinning

Overpinning and Underpinning Solutions



Cracking in masonry structures may be due to many different reasons. These problems can be overcome by using various combinations of **Helical Systems** masonry reinforcement products which can also be utilised in new build situations. The main components of the system are:

HeliTie Bar: A reinforcing bar engineered from austenitic 304 or 316 stainless steel. The stainless steel is extruded giving the bar its unique shape and ensuring a uniform helical design. The method of extrusion produces fins, which are work hardened forcing them into tension, but leaves the core relatively soft and flexible. This design produces a helical bar which has remarkable qualities and whose tensile strength is more than doubled due to the extrusion process. Available in 4.5mm, 6mm, 8mm and 10mm diameters.

HeliGrout: A range is available of very high performance, non-shrink, non-gassing, thixotropic, cement based grouts for use with the application of the **HeliTie Bar**.

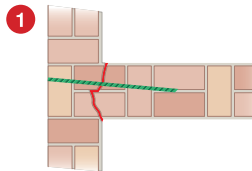
The HeliTie Range of Fixings:

A range of simple, no-nonsense, one-piece, high performance ties are available engineered in the same way as the reinforcing bar. These versatile ties come in different lengths and diameters with 'one point' or 'no points' to suit not only dry applications but also those requiring resin or grout. Their uniform helical shape ensures ease of installation and excellent holding power in a variety of building materials. These ties introduce no expansion pressures or extra stresses into the structure.

CemFix: A fixing used to secure and repair debonded masonry, stabilise solid and rubble filled walls and reconnect party walls to external walls. 8mm in diameter the 'no point' fixing is installed with **HeliGrout** into pre-drilled clearance holes, around 12-16mm in diameter.

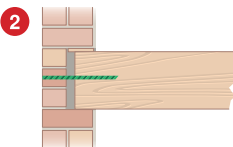
BowFix: A fixing used to stabilise bowed walls. 8mm in diameter the 'one point' fixing is installed directly into the side or the end of floor joists, via a clearance hole in the outer masonry, around 12mm in diameter. The fixing is bonded into the masonry using **HeliResin or HeliGrout**.

HeliTie: A versatile 'no point' or 'one point' fixing used in a variety of applications from timber/timber, timber/masonry and masonry/masonry. 4.5mm, 6mm, 8mm and 10mm diameters are available in various lengths and are inserted with a hammer, insertion tool or power support tool. Ideal for use as a wall tie for laying in the mortar beds on new brickwork. Grade 316 is also available.



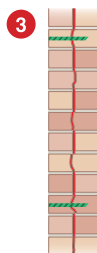
Reconnecting Party Walls with External Walls

CemFixes are installed with HeliGrout into clearance holes drilled to the required depth through the external walls and into the party wall, subject to any necessary permissions.



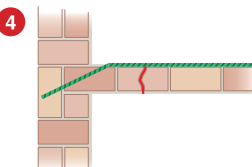
Stabilising Bowed Walls into Joist Ends

BowFixes are inserted through clearance holes in the masonry and power driven directly into the joist ends. They are then load tested before being bonded into the masonry with HeliResin or HeliGrout.



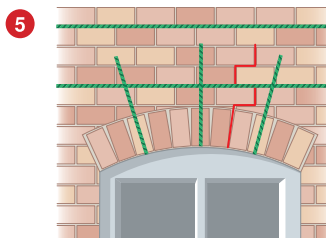
Repairing Separated Masonry

CemFixes are installed with HeliGrout into clearance holes drilled through the near leaf and at least 75mm into the far leaf. The density of the ties will vary depending on site conditions.



Reconnecting Internal Walls with External Walls

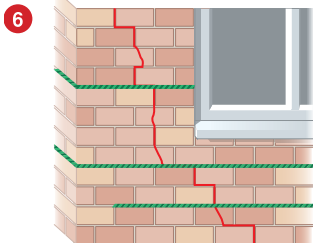
Slots are chased out on the internal wall into the corner. Angled holes of minimum 10mm diameter are drilled from the corner into the external wall. HeliTie Bar is then inserted into the hole and grouted with HeliGrout.



Repairing Brick Arch Lintels

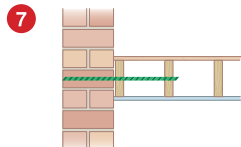
A Helical Masonry Beam is inserted above the lintel and extended 500mm beyond the opening. Angled CemFixes are inserted through the lintel and into the newly formed helical masonry beam above.





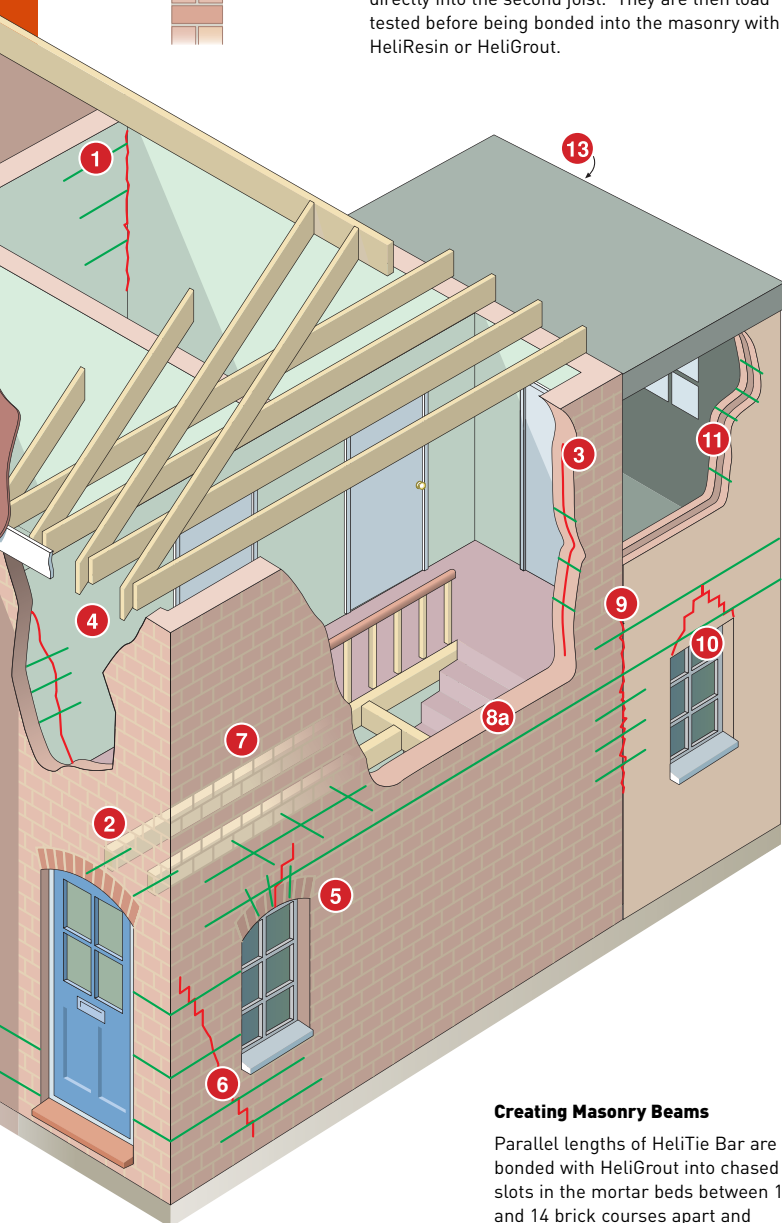
Repairing Cracks near Corners and Openings

Where cracks are less than 500mm from an external corner or a reveal, at least 100mm of HeliTie Bar should be bent around the corner and bonded into the return wall or bent and fixed into the reveal.



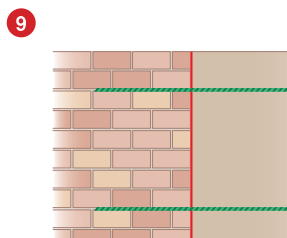
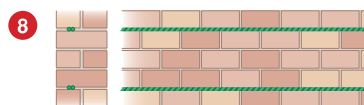
Stabilising Bowed Walls into Joist Sides

BowFixes are inserted through clearance holes in the masonry and the first joist and power driven directly into the second joist. They are then load tested before being bonded into the masonry with HeliResin or HeliGrout.



Creating Masonry Beams

Parallel lengths of HeliTie Bar are bonded with HeliGrout into chased out slots in the mortar beds between 1 and 14 brick courses apart and extended 500mm beyond each side of the opening to create a masonry beam. This beam not only spreads the building loads but also reinforces the masonry.
a) A masonry beam restrains bowing. The presence of a stairwell and the absence of joists prevent BowFixes from being used in this instance.
b) A masonry beam spreads vertical loads where cracking has taken place.



Crack Stitching

Lengths of HeliTie Bar extending 500mm either side of the crack are inserted into mortar beds with HeliGrout.

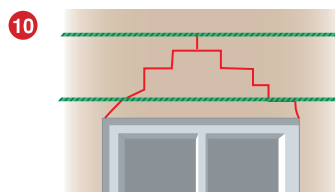
The HeliTie Masonry Beam:

As penicillin is to medicine and the internal combustion engine is to the motor car, so is the HeliTie Masonry Beam the main concept to have resulted from the combination of the HeliTie Bar and HeliGrout. Where masonry has lost its load bearing capabilities the HeliTie Masonry Beam provides the existing failed masonry with the ability, not only to regain its original load bearing capacity, but to increase it. Two HeliTie Bars - 'one chord' - are inserted and bonded with HeliGrout in one bedjoint and another 'chord' is inserted in the same way between one and 14 brick courses above. In this way, the HeliTie Masonry Beam converts the accepted compressive strength of the masonry to a much greater tensile strength enabling building loads to be distributed evenly throughout the structure.

Helical Ground Screw:

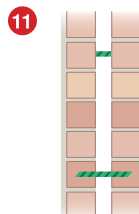
The Helical GroundScrew is an efficient and cost-effective method of screw-piled foundations. Designed to withstand any loads, the GroundScrew is manufactured in a variety of stem diameters with different sized helices. The GroundScrew is very effective in compression and tension allowing it to be used for new build applications and also for earth retaining wall stabilisation. The GroundScrew can also be used to underpin and, if necessary, jack-up structures. A HeliTie masonry beam is inserted in the bedjoints above the GroundScrew to prevent point loading from the jacking cap and to also spread the load. The system is very quick and easy to install and lightweight equipment is all that is required for installation and on-site testing.

The illustration shows a typical two storey semi-detached property of solid wall construction with a later cavity wall extension.



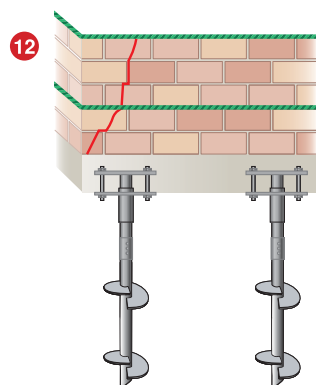
Repairing Failed Lintels

The HeliTie Masonry Beam uses parallel lengths of HeliTie Bar bonded with HeliGrout into chased out slots in the mortar beds between 1 and 14 brick courses apart and extending 500mm beyond each side of the opening.



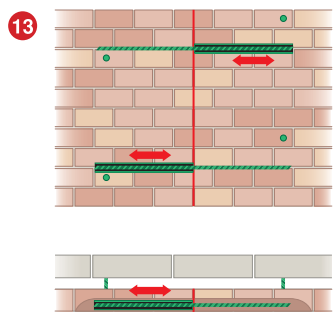
Replacing Cavity Wall Ties

HeliTies 1 Point are inserted using a hand tool or a power support tool and, depending on site conditions, bonded with HeliResin or HeliGrout. Should site conditions prevail, the HeliTie 1 Point can be driven into both leaves through a small pilot hole.



Helical Ground Screw

A lead section of GroundScrew is screwed into the soil immediately adjacent to the exposed footing. Extensions are fitted to the lead GroundScrew to achieve the required depth. A jacking cap, incorporating a supporting plate, is placed on the GroundScrew and located underneath the footing. The jacking cap is then raised with a hydraulic ram to support the foundation and to prevent further subsidence. This procedure can be repeated throughout the property to fully underpin the structure.



Movement Joint

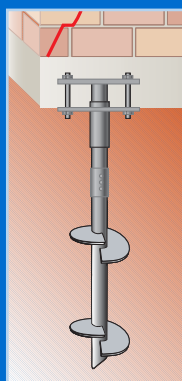
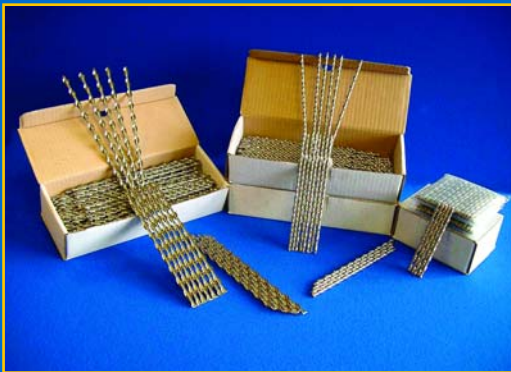
Slots are cut in the outer leaf every 450mm along the movement joint and a length of HeliTie Bar inserted. The HeliTie Bar is fixed on one side of the joint and sleeved on the other side along the whole length of the joint allowing normal movement but preventing lateral movement.

Structural Reinforcement for Remedial and New Build Applications

Helical Systems HeliTie Bar and HeliGrout have been independently tested and approved within Europe. They have been designed for use in all forms of substrate including bricks, blocks, concrete, stone and timber as well as regional building materials. These structural reinforcement products have been proven to be effective in all types of structures whether old or new and are particularly suitable for Listed and Heritage Buildings and where an aesthetic approach is required.



With the installation ease of a nail and the performance capabilities of a screw, HeliTies are ideal for a massive range of new build and remedial applications; from traditional to new building technologies. HeliTies have undergone the same rigorous testing as the HeliTie Bar and HeliGrout. A simple 'pull out test' can be applied to HeliTie fixings to prove their integrity. A full range of accompanying tools, both hand and power driven, and accessories are available.



The GroundScrew is a cost-effective and quick solution to subsidence problems eliminating the need for mass concrete underpinning. It involves minimum upheaval to residents and gardens and produces virtually no spoil. A load bearing HeliTie Beam is installed into the masonry above the GroundScrew insertion to spread the load and prevent point loading. In this way disturbance to the substrate above is reduced. If required, Jacking Caps can be fitted to the top of the GroundScrews enabling the structure to be 'jacked up'. The GroundScrew system is well suited for all types of foundation, eg strip, stepped footings, offering additional support where the original foundations have failed. Fully engineered and guaranteed.

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