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February 2013

HELIFIX

SUSTAINABLE STRUCTURAL SOLUTIONS

Principles, Products & Applications




HELIFIX

SUSTAINABLE STRUCTURAL SOLUTIONS

Helifix products and their concealed, non-disruptive, installation techniques play an important role in preserving our built environment, from housing, offices, factories and bridges to churches, listed buildings and heritage structures.

Wherever possible, repair and refurbishment is increasingly seen as a more sustainable option than demolition in terms of architectural value, materials usage, overall cost and environmental impact.

Contents

About Helifix

Helifix is a technically led company with an on-going product development programme backed by thorough independent testing. Having created the original one-piece stainless steel helical fixing nearly 30 years ago, Helifix became the market leader in the design and manufacture, at its own UK factory, of specialist helical wall ties, fixings and masonry repair systems.

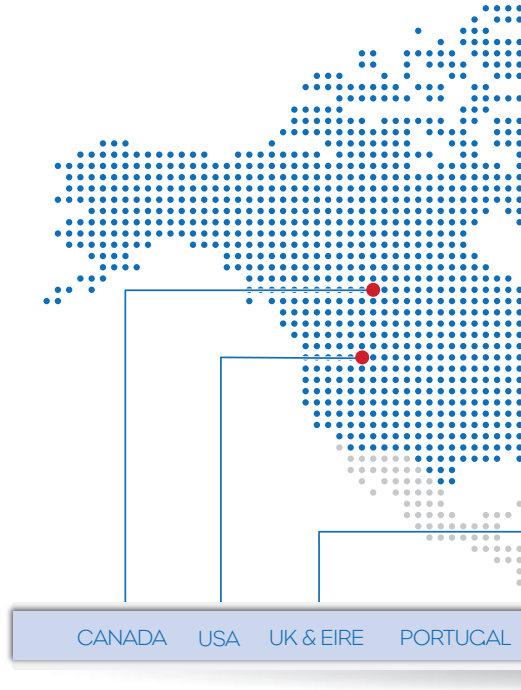
With an enviable reputation for product quality, engineering excellence and comprehensive customer service, Helifix has considerable experience and technical expertise which it continues to develop to enhance its market position. It prides itself on possessing the necessary in-house skills to undertake all aspects of any project including advice, support, on-site back-up and the design of high quality repair solutions using innovative, non-disruptive, concealed installation techniques.

Helifix is the market leader in the design and manufacture of specialist helical ties, fixings and masonry repair systems.

The Helifix process is at the core of its operational capabilities and unrivalled service. It enables Helifix personnel to be involved at each stage of the project, working closely with clients and their appointed construction professionals to ensure that an effective and reliable solution is delivered efficiently and cost-effectively.

The process incorporates a detailed survey of the defects and an assessment of the situation, together with diagnosis of the problem and its causes plus recommendations for its solution. This is followed by schematic designs and specifications by qualified resident engineers with quality installation by a nationwide network of fully trained Approved Installers. All designed repairs are underwritten by Helifix professional indemnity insurance and 10 year insurance - backed warranties are available for all repair works.

Helifix operates throughout the UK and has become firmly established in many parts of the globe. Its simple, yet extremely effective, products and techniques are widely used and recommended by the principal manufacturers of complementary construction materials. Helifix's versatile products are well proven in virtually all commonly used construction materials, combining strength, durability and holding power with the flexibility to allow normal building movement. They provide secure and lasting connections in new build applications and sustainable remedial solutions that greatly extend the life of existing structures, Helifix products and processes deliver considerable benefits that are both well recognised and highly regarded.



NATURAL HISTORY MUSEUM, LONDON, UK
A number of cracked and failed window arches in the offices and storage facilities of this listed building were sympathetically repaired and restored internally using the Helibeam System.

ITALY POLAND NETHERLANDS CZECH REP SOUTH AFRICA SCANDINAVIA INDIA CHINA FAR EAST AUSTRALIA NEW ZEALAND

CHRYSLER BUILDING, NEW YORK, USA

HeliBars, bonded with HeliBond grout, were used on this famous building to undertake one of the first crack stitching repairs carried out in the USA.

WRIGLEY BUILDING, CHICAGO, USA

Chosen for their high performance, ease of installation and secure connection in soft building materials, DryFix ties were used to re-pin the terracotta panels on this landmark building.

SYDNEY OPERA HOUSE, AUSTRALIA

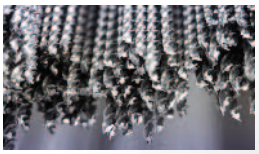
Marine grade DryFix ties were selected, due to their fixing security and loading resistance, as the most effective means of securing new concrete caps to main pillars supporting the forecourt at the iconic Sydney Opera House.

Innovation

Since its inception Helifix has been recognised as a leader in the design and engineering of innovative construction ties, fixings and reinforcements. Helifix was the originator of the one-piece stainless steel helical tie which has since become an accepted standard for the industry. This revolutionary design has since formed the basis of a comprehensive range of special purpose new build and remedial products.

These original designs, and their associated concealed, non-disruptive, installation techniques, provide many outstanding benefits, from the simplicity of their design to ease of installation and long term performance. They combine the required strength with flexibility, durability and great holding power in all commonly used building materials to provide cost-effective, sympathetic solutions for all forms of masonry stabilisation in remedial situations and secure, lasting connections in new build applications.

1984
Helifix is formed 12 March 1984. The unique helical Hi-Fin design is developed and testing is carried out by Oxford Polytechnic – now Oxford Brookes University. The first tie, made from thin wall copper tube, is launched.



1987
RetroTie, the first stainless steel helical remedial wall tie is launched.

1992
The Helibeam System of structural beaming is developed, working with the BRE, Middlesex University, Curtins Consulting Engineers, and first used at RAF Northolt. Helifix Australia begins trading. Obtain ISO9001 approval.

1995
After exhibiting at a show in Prague, Helifix appoints an agent in Czech Republic and Helifix CZ is still going strong.

1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996

1984 1988 1992 1996

1985
TimTie, a new build timber frame tie and the first made from stainless steel.

InSkew warm roof batten fixing developed in collaboration with Celotex for a roof in Cardiff and is used on the AA building in Basingstoke.

1986
Factory is set up in Wallsend, Tyne & Wear

1988
Helifix attends its first Interbuild exhibition in Birmingham.

1990
Formal offices are established at Shepherds Bush Green, London. First major remedial wall tie project using RetroTies on 1500 houses in Basingstoke.

1993
The first Approved Installer is appointed for remedial wall tie installation. The following year the first Helibeam training course is held and the Approved Installer network is established

1994
The DryFix principle of a remedial, mechanically fixed tie, with no grouts or resins, is launched.

1996
Participate in trials at the TRL for bridge repair techniques and measure the enhancement Helifix systems provided on full scale brick arches, forming the basis for our bridge repair programme.

1997
Helifix factory moves to North Shields.

Research and Development

Until 1984, when the BRE published a paper on the 'Performance Specification for Wall Ties', there had been no examination of the performance requirements of wall ties and no basis for their design and testing. Mild steel twist ties were weak and subject to corrosion, while remedial ties were based on masonry fixings and in many cases were often ineffective or, due to their rigidity, actually caused further masonry damage by creating additional stresses and cracking.

Recognising the need for a purpose-designed wall tie, Helifix engineered an entirely new style of remedial tie, using austenitic stainless steel, with a unique helical shape. A non-expansion mechanical resin fixing, this new tie was very strong axially, to resist wind suction, yet sufficiently flexible to accommodate natural building movement, introducing no additional stresses by avoiding expansion.

An on-going programme of research and development has, over the years, produced a variety of innovative ties, fixings and repair systems. These include: RetroTie, the first stainless steel remedial helical wall tie; InSkew, a high performance, self-tapping warm roof batten fixing; TurboFast, a multi-purpose timber to masonry flush fixing; DryFix, a rapidly installed remedial wall tie, requiring no grouts, resins or mechanical expansion, that uses a specially developed power-driven tool for a recessed installation; the Helibeam System of structural beaming, using existing masonry, that reinforces the structure, spreads loads and minimises the need for mass underpinning.

All Helifix products have undergone extensive independent testing at a number of universities, both in the UK and overseas, and at well recognised bodies such as the BRE, TRADA and the TRL. Full details of the complete test programme are available on our website. Furthermore, Helifix products are manufactured to exacting standards in Helifix's own UK factory, under the ISO 9001 quality assurance scheme, ensuring high levels of quality control and traceability.

1998
Helifix offices move to Warple Way, Acton, London. Helifix North America Corporation, based in Toronto, begins trading. First major bridge contract to secure the 18 arch Chelmsford Viaduct. HeliBar reinforcement used extensively during construction of the Holm Bush athletes village for the Sydney Olympics.

2001
Start offering a range of Helifix products in India following Gujarat earthquake, in particular for heritage buildings and bridges.

2005
Management buy-out of Helifix from the original shareholders.

2009
Helifix, Inc. is set up and the North American business is moved from Toronto to new premises in Streetsboro, Ohio, USA.

2010
Helifix NZ is established just months prior to the disastrous Christchurch earthquake in February 2011.

1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

2000 2004 2008 2012

1999
Significant overseas contract to repair a multi-storey housing complex in Gibraltar.

2006
Introduction of the InSkew and HeliBar 'Super 6' high performance 6mm diameter.

2008
Obtain European CE marking approval for several key products.

2012
Helifix Group is acquired by CRH plc, the international building materials group.

Our Process

1 Survey
A thorough structural survey is undertaken by Helifix, or one of its Approved Installers, to assess the situation and establish the nature of the problem.

2 Diagnosis
The exact cause (or causes) of the problem is carefully diagnosed by an experienced engineer. This is essential in order to devise an appropriate solution.

3 Design & Specification
A Helifix engineer devises the most suitable repair programme to overcome the identified structural faults and cost effectively restore structural integrity with minimal disturbance to the building fabric.

4 Tender
The repairs are then put out to tender so as to obtain best value for the client, who negotiates directly with the contractor independent of Helifix.

5 Installation
The repairs, as specified in the Helifix schematic design, are normally undertaken by one of Helifix's fully trained Approved Installers who, collectively, provide national coverage.

6 Guarantees
10 year insurance-backed warranties are available. These include design, products and installation and are bonded by the CPA (Consumer Protection Association). They are in addition to Helifix Professional Indemnity insurance.

1. Survey

The first stage of the Process is to carry out a survey of the structure to establish the problem.

Helifix is happy to work with surveyors, structural engineers and architects appointed by the client in order to provide a reliable and cost-effective long term solution. Either way, a thorough inspection is conducted by a Helifix trained surveyor to assess the situation and establish whether the condition is historic or still progressive. The survey is normally free of charge and is undertaken by a Helifix Area Manager or a Helifix Approved Installer.

A thorough inspection is conducted by a Helifix trained surveyor.

A detailed report of the survey is added to the Helibeam Project Form (HPF) together with a diagnosis of what caused the structural faults and the best means of resolving the situation. This may involve other on-site work such as the removal of a nearby tree or the repair of leaking drains if these are seen to be causing subsidence problems.

Overview

All Helifix projects are logged from start to finish in a comprehensive technical audit. This detailed documentation ensures that all aspects of any given project are recorded to provide a complete picture of all operations and to create a comprehensive record for future reference, should it be required.

Detailed survey information is recorded on a Helibeam Project Form (HPF), which is at the core of the project documentation.

The HPF will include key details of the structure such as the construction type and the materials used, the contact details of all involved parties, site investigations, other reports, problem diagnosis including project drawings and site photographs, repair specifications, contractor's details and all relevant dates.

Work is generally, (although not exclusively), undertaken by a member of Helifix's nationwide network of fully trained Approved Installers who, with years of experience, are specialists in structural repair work and are registered with Helifix's insurers.

The designed schematic repairs are covered by Helifix's Professional Indemnity Insurance and 10 year warranties are available, via the Approved Installer and signed off by Helifix, for the repair works that are undertaken.

To provide further security and future peace of mind and to complete what is believed to be the most detailed and comprehensive repair process available, each warranty is also bonded by the CPA (Consumer Protection Association).

2. Diagnosis

Correctly diagnosing the exact cause or causes of the problem is critical in order for suitable remedial action to be carried out.

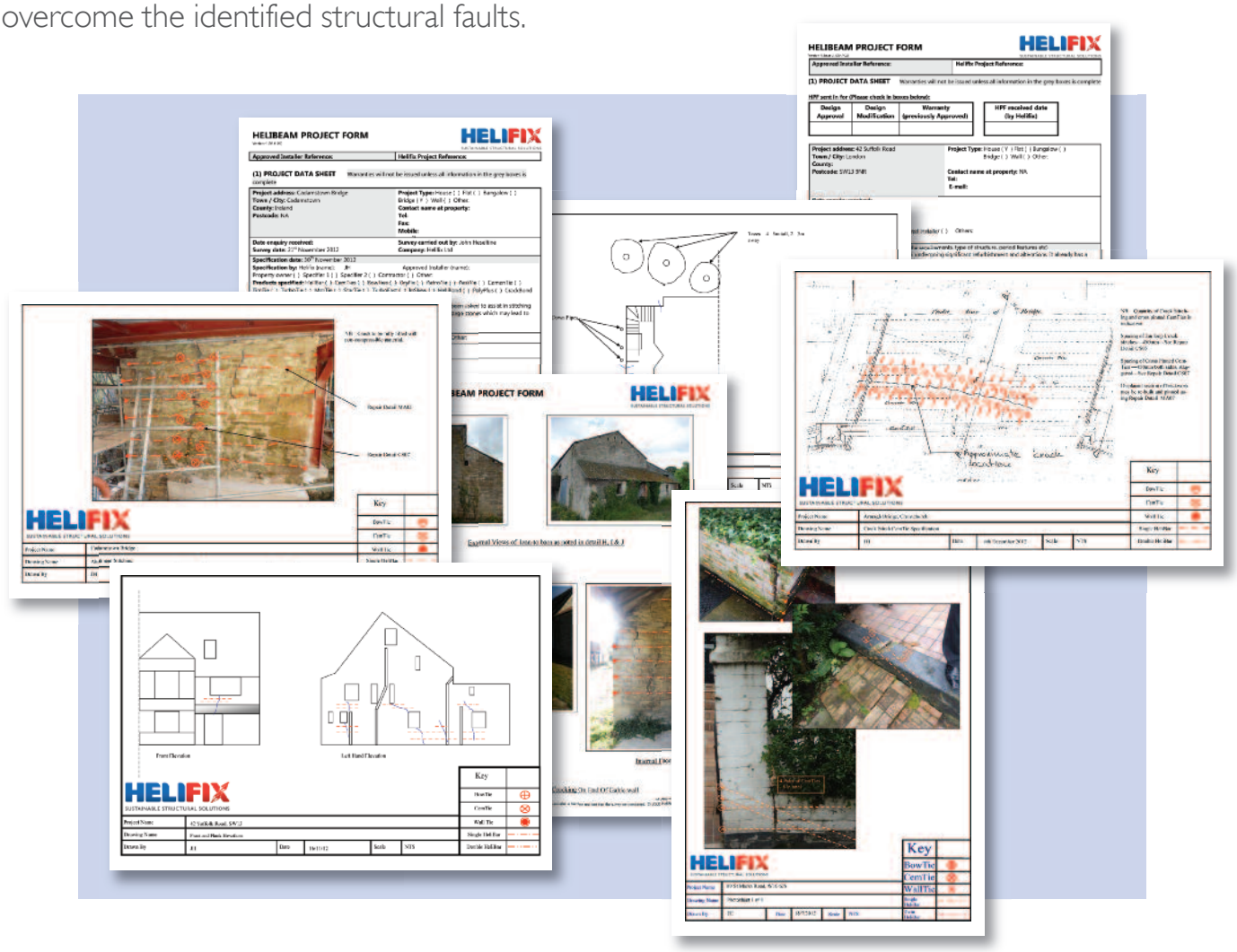
Masonry cracking and failure has many causes so careful diagnosis is vital if the repairs are to be effective. Even after lengthy monitoring it can be challenging to establish precisely the underlying cause, so Helifix's experience is invaluable in developing repair strategies.

The most appropriate repair strategy is devised by a Helifix engineer.

Whatever the visible structural faults, it is essential that a qualified engineer, who understands building movement and stresses, devises the most appropriate repair strategy with the solution tailored to suit the specific needs of the project. Helifix engineers provide expertise and support to ensure the most efficient solution is used.

3. Design and Specification

Having diagnosed the problem and its causes, Helifix engineers then devise the most appropriate repair programme to overcome the identified structural faults.



Our schematic designs are value-engineered, using the appropriate Helifix products to restore structural integrity. In the majority of cases, the existing masonry is retained, thereby avoiding time-consuming and expensive dismantling and rebuilding.

By understanding the properties and abilities of the various Helifix systems and how they interact with the behaviour of the building and its particular materials, the repairs are designed to resolve the structural problems with the minimum of disruption to the building fabric.

The specified repairs are designed to resolve structural problems with the minimum of disruption.

Helifix solutions spread the structural loads, avoid point loads and, by being flexible enough to allow normal structural movement, avoid the introduction of any new stresses. Such optimised designs, all covered by Helifix Professional Indemnity insurance, provide reliable, economical and aesthetically pleasing solutions by being fully concealed, thereby making them ideal for historic and listed structures.

4. Tender

Once the repair programme is completed and added to the HPF it is put out to tender in order to obtain best value pricing.

To ensure impartiality, Helifix is not involved in this process and the client negotiates directly with the Approved Installer to establish costs and work scheduling as well as detailing any additional work that may be required from the contractor while they are on site.

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5. Installation

Installation of all the specified Helifix products and systems is undertaken by one of the Helifix Approved Installers who provide effective coverage for the whole of the UK.

All Approved Installers have been fully trained in the appropriate concealed, non-disruptive, installation techniques required for all Helifix products. They maintain high standards of professional workmanship at all times.

6. Guarantees

On completion of the repairs to the satisfaction of both the client and Helifix, 10 year insurance-backed warranties, which are signed off by Helifix, are available to cover the work carried out.

This warranty is in addition to normal product guarantees and the cover provided for the designed repairs, which is backed by Helifix PI Insurance. Finally, to ensure further protection, each warranty is bonded by the CPA.

If a warranted project requires reviewing at a future date, all relevant information is contained within the HPF and can be referred to at any time as part of the unique Helifix technical audit process.

Advice & Technical Support

Helifix has considerable experience and expertise in new build ties, fixings and masonry repair and reinforcement techniques. Its willingness to share this knowledge with clients, contractors and specifiers requiring specialist advice and assistance has helped to build its reputation and enhance its position as the market leader.

Technical support is provided at all stages during a project, by telephone, email and on site, in order to achieve the best structural solution, cost-effectively and with the minimum disruption to the structure and its occupants.

Helifix also conducts CPD-approved seminars and technical presentations at clients' offices and offers numerous detailed repair specifications.

In addition, it undertakes quality controlled precision manufacturing with extensive product testing by independently accredited bodies. This has resulted in Helifix being approved and recommended by the principal manufacturers of complementary construction materials. Helifix is not just a supplier but a fully supportive partner throughout a project from initial contact to final guarantees.

CPD CERTIFIED Construction CPD Certification Service

Range of Applications

Helifix products are extremely versatile and adaptable and have been successfully used to overcome a wide range of structural faults, restoring integrity to virtually every type of structure from council houses, tower blocks, churches and castles to masonry bridges, tunnels and chimney stacks.

Homeowners

For well over 25 years, masonry repair specialist Helifix has been helping UK homeowners overcome all types of structural faults - from failed wall ties and sagging lintels to bowing and separated walls and subsidence related problems.

Masonry cracking and failure has many causes, ranging from the purely aesthetic to major structural problems, so it is important that the cause is identified and the design and implementation of appropriate remedial work is carried out. A fully qualified surveyor should be called to conduct a thorough survey and Helifix or one of our experienced Approved Installers can assist those who have identified potential structural problems with their property.

New Build

Since its inception, Helifix has developed highly regarded special purpose new build ties. TimTie, Type 6 ties for timber frame constructions, are installed into the timber stud, through the insulation, as required to provide secure and lasting connection.

TurboTies secure outer leaf masonry to inner leaf blocks, panels and thin joint systems to overcome the problem of absent or misaligned mortar beds.

InSkew, created specifically for batten fixing on warm roof constructions, withstands roof weight and wind suction loadings and does not compress or impair insulation.

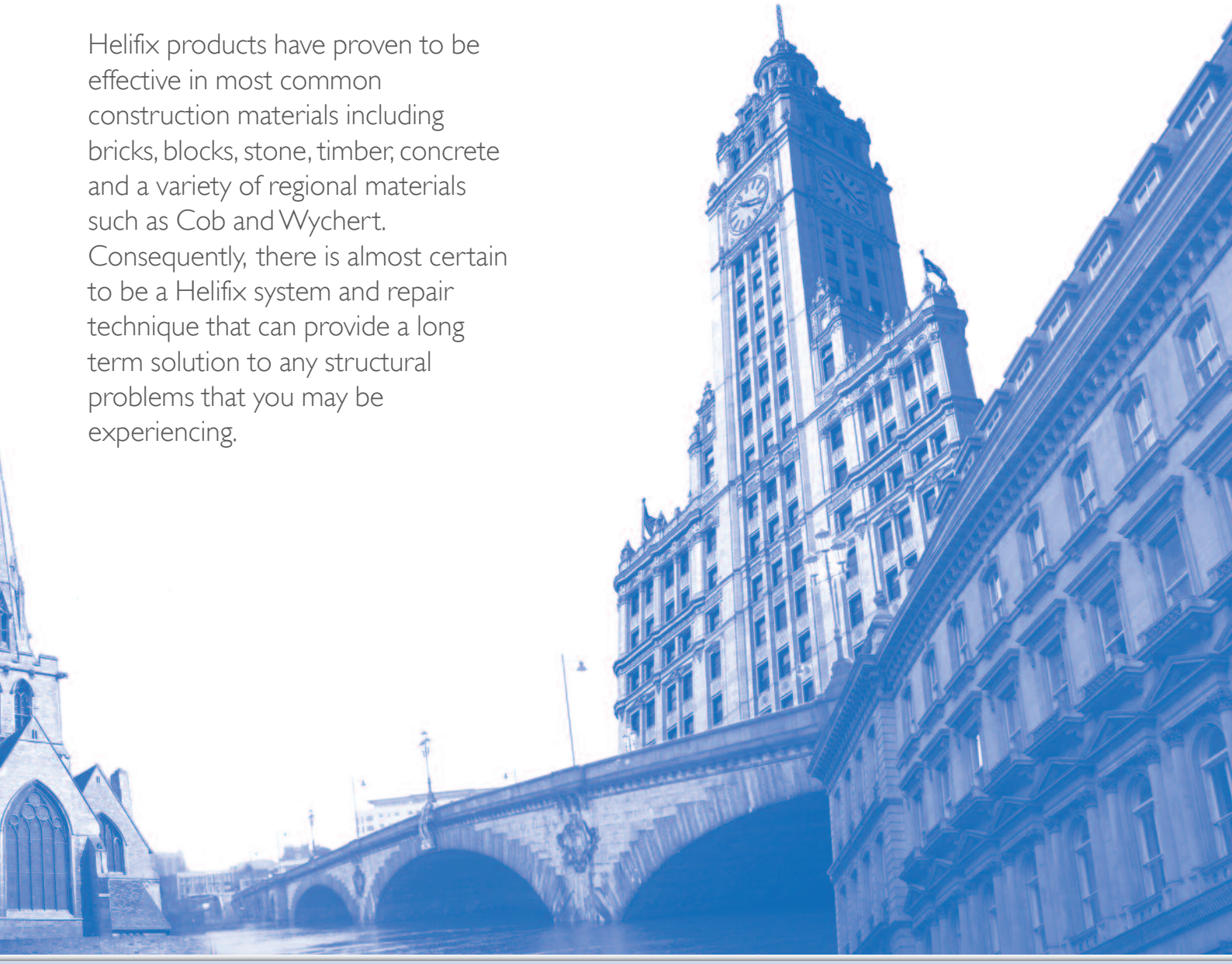
TurboFast is a versatile multi-purpose headless fixing for securing timber or MDF to bricks, blocks and concrete in numerous situations.

Social Housing

Helifix has long been involved with Local Authorities and Housing Associations, assisting them to maintain and upgrade their housing stock. Helifix fast-track solutions are reliable and cost-effective, extending the life of properties while saving both time and money and causing minimal inconvenience to tenants.

Efficient repairs have been undertaken on all forms of housing from terraces to tower blocks, including various prefabricated homes. These include large wall tie replacement schemes; rapid low cost lintel creation and repair, particularly during window replacement programmes; devising effective means of securing brick panels on concrete frame tower blocks; high-rise remedial wall tie installation using economical abseiling techniques.

Helifix products have proven to be effective in most common construction materials including bricks, blocks, stone, timber, concrete and a variety of regional materials such as Cob and Wychert. Consequently, there is almost certain to be a Helifix system and repair technique that can provide a long term solution to any structural problems that you may be experiencing.



Historic & Listed Buildings

By their very nature, these significant buildings are often suffering from various structural problems and require reliable and sympathetic solutions that leave the structure secured but visually unaltered.

It is important that our heritage buildings, such as stately homes, churches, museums and public buildings, retain their aesthetic appearance while being structurally secured for future generations.

Helifix has considerable experience of working with conservation professionals and bodies such as English Heritage, Cadw and Historic Scotland. Often projects may involve lime mortars and weak or unusual materials. These solutions retain the existing masonry and, due to the fully concealed nature of the products, leave the structure visually unmarked.

Bridges

Age, weathering and increasing loads and stresses have, in numerous cases, led to problems on many of the UK's 60-70,000 masonry arch bridges. A large number are well over 100 years old, are often listed structures and urgently require structural repairs and strengthening.

Following extensive research at the TRL, Helifix has developed a range of innovative solutions for the maintenance and strengthening of brick and stone masonry bridges, viaducts and tunnels.

Commercial & Public Buildings

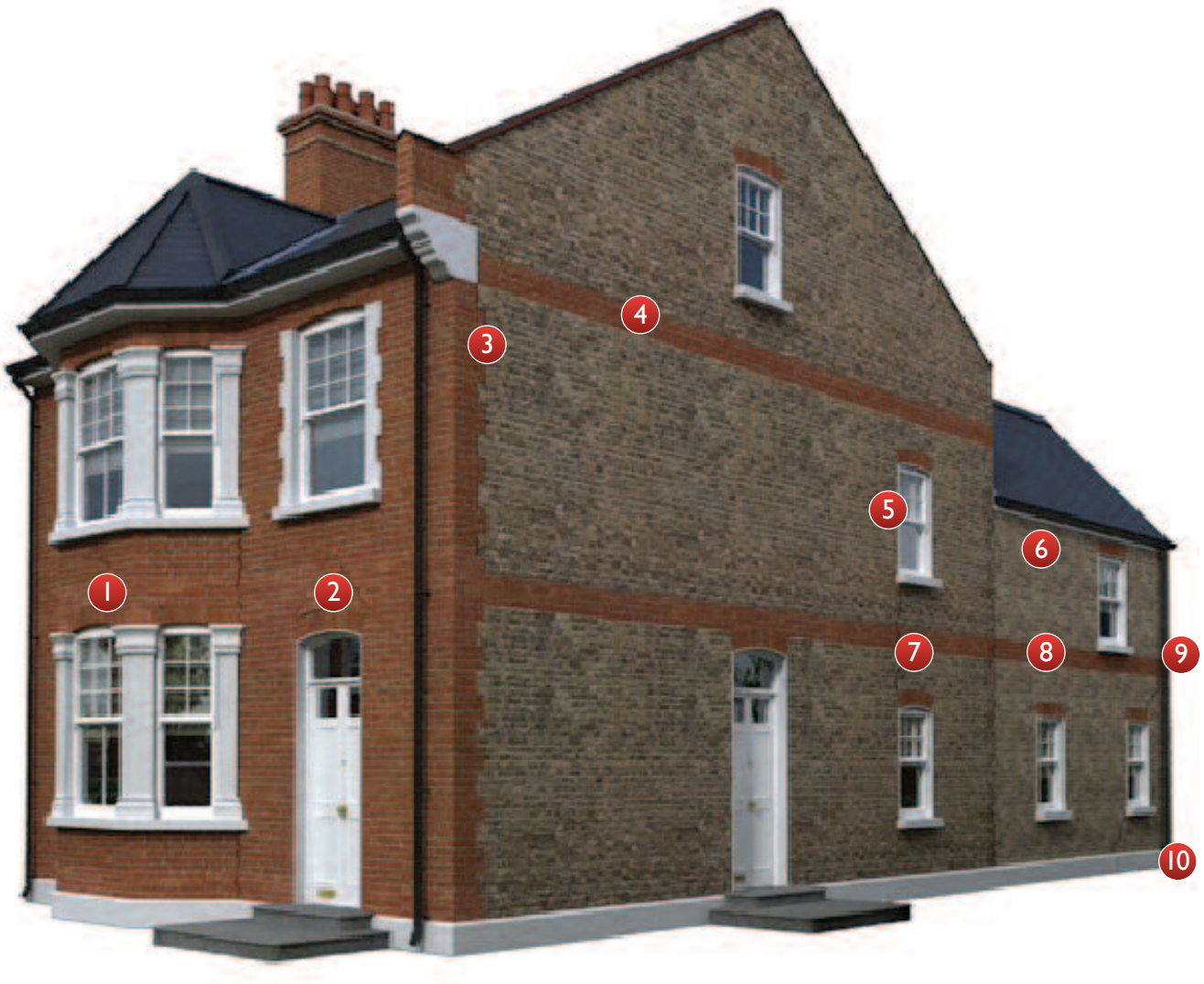
Low and high rise offices, factories, warehouses, pumping stations, schools, hospitals and museums are just some of the commercial and public buildings that have benefitted from the use of Helifix systems.

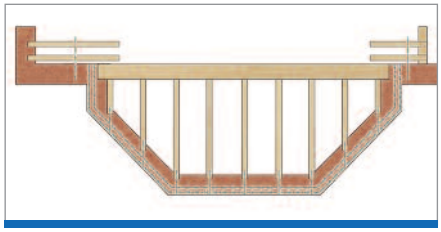
In most cases such buildings need to remain fully operational throughout the contract period so, with rapid installation and the vast majority of work being undertaken externally, Helifix is able to keep disruption to an absolute minimum.

Masonry Repair Strategies

Masonry may deteriorate, crack, delaminate and fail for a variety of reasons. Most problems can be overcome by using various combinations of Helifix's extremely versatile and adaptable remedial ties, fixings and masonry reinforcement products. If you have a particular problem and require assistance, call our technical support team who will be pleased to help.

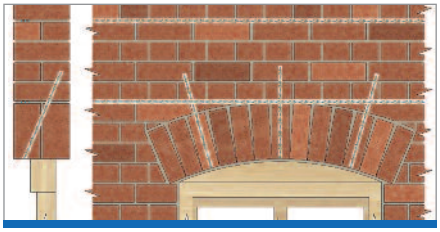
The illustration highlights some of the most commonly occurring structural faults that affect every type of residential and commercial property of all ages and construction. Helifix masonry repair strategies will provide a reliable and lasting solution to these and many other situations which are not shown here such as creating movement joints, failed parapet walls, separated cornices, blown render and many more besides. Full details of many other repairs are available on our website in the Downloads section under Repair Details.





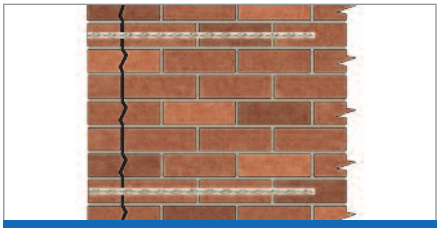
1 Repair of bay windows

HeliBars are bonded into predetermined cut slots around the bay above and below the window with the ends embedded in the front elevation. BowTies are driven into the joist ends via clearance holes in the masonry, before the outer end is bonded into the masonry with PolyPlus resin.



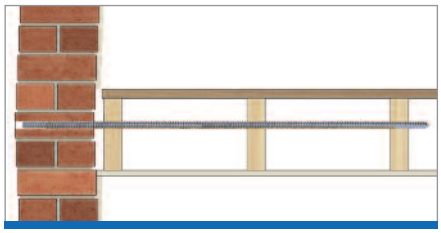
2 Repairing brick arch lintels

Parallel lengths of HeliBar are bonded into the specified cut slots directly above the existing lintel. Angled CemTies or DryFix ties can be installed up through the lintel and into the masonry above the lower HeliBars.



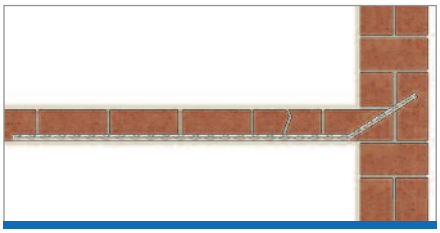
3 Repairing cracks near corners and openings

Using CemTies - Having drilled clearance holes through the front elevation and into the side elevation masonry, CemTies, loaded into the grout-filled gun nozzle extension, are injected to the back of the hole and installed simultaneously with HeliBond grout.
Using HeliBars bonded into cut slots - Where cracks are less than 500mm from an external corner or an opening, at least 100mm of HeliBar is bent round the corner and bonded into the return wall.



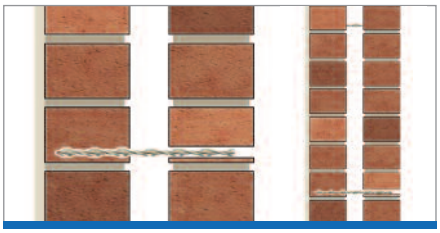
4 Stabilising bowed walls into joist sides

BowTie HDs are inserted through clearance holes in the masonry and are power-driven through the first and second joist (and third, if required) before the outer end is bonded into the masonry with PolyPlus resin.



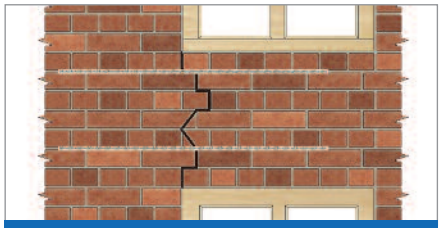
5 Reconnecting internal walls with external walls

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



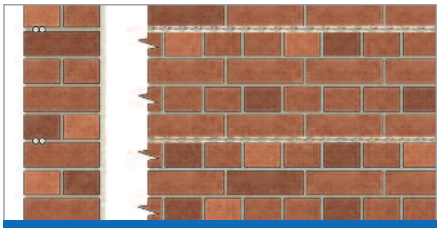
6 Replacing cavity wall ties

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



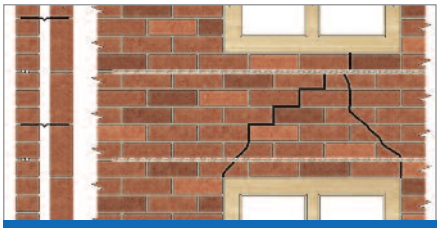
7 Crack stitching

Lengths of HeliBar extending 500mm either side of the crack are bonded into slots, normally cut into the mortar beds, with HeliBond grout or PolyPlus resin for a reliable and permanent solution. Where cracks are less than 500mm from an external corner or an opening, at least 100mm should be bent round the corner and bonded into the return wall or bent and fixed into the reveal, avoiding any DPC membrane.



8 Creating masonry beams

The Helibeam System uses long, parallel lengths of HeliBar reinforcing bars bonded into predetermined slots, normally cut in the mortar beds, with HeliBond grout to form deep masonry beams which distribute the building loads. These can be used to resist vertical loads to prevent building subsidence or the horizontal displacement of a bowing wall, e.g. to span an internal stairwell where BowTies cannot be used.

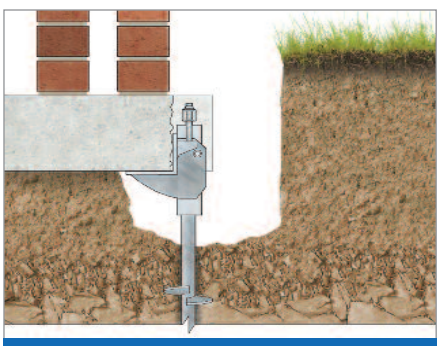


9 Repairing or creating flat arch lintels

Parallel lengths of HeliBar are bonded into the specified cut slots above the opening or lintel to form masonry beams and create lintels using the existing brick or stone work.

10 Overcoming foundation settlement

Depending on the cause and severity of the situation, a combination of helical micro-piles (to support the foundations) and the Helibeam System (to secure the superstructure) provide a technically superior and cost-effective alternative to more expensive and disruptive stabilisation methods that require extensive excavations, heavy plant and major spoil removal.



For more information please visit:
www.helifix.co.uk

Applications

Helifix remedial products are extremely versatile and have wide ranging applications. This means that individually or in combination they are able to provide rapid, reliable and cost-effective solutions to virtually all commonly occurring structural faults. Furthermore they do so in a sympathetic and non-disruptive manner that leaves the structure visually unaltered but fully stabilised.

The Helibeam System is at the heart of many applications, repairing and reinforcing the masonry and spreading the structural loads. Stainless steel HeliBars combine great axial strength with flexibility, enabling them to follow irregular mortar beds and be bent around corners while accommodating natural building movement.

In conjunction with other ties and fixings, the Helibeam System provides a full range of aesthetic and sustainable repair solutions restoring, and extending, the life of our built environment.

- Crack Stitching
- Lintel Repairs & Creation
- Replacing Failed or Omitted Wall Ties
- Creating Load Bearing Masonry Beams
- Restraining Bowed External Walls
- Reconnecting Separated Walls
- Repairing Masonry Arches
- Stabilising Rubble-Filled & Random Stone Walls
- Bay Windows
- Securing Parapet Walls
- Creating Movement Joints

Full details of all applications and repairs are available at: **www.helifix.co.uk/downloads**

Crack Stitching

A quick, simple, effective and permanent means of stabilising cracked masonry, Helifix crack stitching involves bonding stainless steel HeliBars into appropriate bed joints or cut slots in bricks, blocks or stonework, using HeliBond cementitious grout.

These products combine to produce an excellent bond within the substrate, resisting tensile loads and minimising any future development of the crack, which may occur with simple injection methods. With this concealed non-disruptive method no additional stresses are introduced as the HeliBars are flexible enough to accommodate normal building movement.

Products required: **HeliBar** - page 22 **CemTie** - p25
Repair Details: CS01 - CS14

Lintel Repair & Creation

Where lintels have lost their load-bearing capabilities, the traditional solution is to cut out the brickwork, mechanically support the masonry above and install a new lintel, which is disruptive, time consuming and expensive.

HeliBars bonded into the existing masonry above the window create a masonry beam which provides structural support, often in conjunction with vertical pinning using DryFix or CemTies. During window replacement programmes, where the existing window frame supports the masonry, this Helifix method provides a rapid and economical technique for creating a lintel.

Products required: **HeliBar** - page 22 **DryFix** - p23 **CemTie** - p25
Repair Details: LR01 - LR11

Replacing Failed or Omitted Wall Ties

Wall tie failure is a major cause of masonry cracking and, if not addressed, can lead to catastrophic collapse of the outer masonry leaf.

There are Helifix remedial ties for all situations and materials. DryFix ties are probably the quickest and most cost-effective ties available. Requiring no grouts or resins, they are simply power-driven into both leaves, via a small pilot hole, using a special attachment which leaves the tie recessed below the face. RetroTies are dry-fixed in the far leaf and resin bonded at the outer end, ResiTies are resin-bonded at both ends and CemenTies are designed for use with thin wall far leaves and buildings over four storeys high.

Products required: **DryFix** - page 23 **RetroTie** - p24 **ResiTie** - p24 **CemenTie** - p24 Repair Details: WT01 - WT34

Creating Load Bearing Masonry Beams

Where masonry has cracked and failed as a result of ground movement, component failure, weathering or increased loads and stresses, the innovative and versatile Helibeam System ties the masonry together and creates deep masonry beams from the existing masonry.

Pairs of HeliBars are bonded with HeliBond grout into cut slots, usually within the mortar beds, at pre-determined levels. These masonry beams secure and reinforce the structure and redistribute the loads away from the problem area. Their composite action provides great strength combined with structural flexibility, while other ties and fixings provide appropriate lateral and vertical restraint to complete the repairs.

Products required: **Helibeam System** - page 21
Repair Details: LB01 - LB05

Restraining Bowed External Walls

The bowing external walls of a building can be stabilised quickly and simply by securing them to internal floor or roof joists using BowTies or BowTie HDs.

Easy external installation means minimal inconvenience for the occupants while providing an unobtrusive repair with no external plates. Standard BowTies are used when securing the wall into joist ends and heavy duty BowTies HDs when mechanically connecting to two or three parallel joists. The BowTie is inserted through a clearance hole in the wall and simply power-driven into position before being resin bonded into the masonry.

Products required: **BowTie** & **BowTie HD** - page 24
Repair Details: RB01 - RB09

Reconnecting Separated Walls

Cracked internal walls which have separated from the main outer walls can be repaired and reconnected both internally and externally.

From the exterior, long series grouted CemTies are installed, at a slight angle, through the external brick or stone wall and into the internal wall, stitching cracks and holding the two walls together. Internal repairs involve drilling angled clearance holes into the exterior wall at the junction of the two walls into which HeliBar ends are bonded before being grouted into cut slots along the internal wall.

Products required: **CemTie** - page 25 **HeliBar** - p22
Repair Details: RW01 - RW06

Repairing Masonry Arches

The versatile Helibeam System can be used to reinstate the structural integrity of all forms of arches from doorways and lintels to tunnels and bridges.

With smaller arches the method is outlined in Lintel Repair & Creation (p17) with angled CemTies or DryFix ties installed up through arch masonry. There are numerous problems relating to masonry arch bridge repair. Helifix has a comprehensive range of solutions for a variety of different situations and problems. These are listed on our website in the Repair Details downloads section under 'Masonry Arches'.

Products required: **Helibeam System** - page 21 **CemTie** - p25 **DryFix** - p23
Repair Details: MA01 - MA08

Stabilising Rubble-Filled & Random Stone Walls

As rubble-filled walls age, the fill often settles causing the walls to bulge outwards.

CemTies are ideal for stabilising such walls, as well as securing delaminated or separated masonry walls. The CemTies are fully grouted, being installed simultaneously with the HeliBond grout which flows to fill localised voids. They are ideal for overhead working and for older structures with friable material, such as churches, barns and random stone walls.

Products required: **CemTie** - page 25
Repair Details: RF01 - RF09

Bay Windows

Bay windows may crack and separate from the main structure because of differential foundation movement or as a result of differing materials having been used on the bay and the main house building.

Once the foundations are stable, bay windows can be secured to the house by using a combination of the Helibeam System and BowTies. Pairs of bonded HeliBars, installed around the bay and back into the main structure, will reinforce and stabilise the bay masonry, spread the loads and stitch cracks. BowTies will provide lateral restraint by securing the bay to internal floor joists.

Products required: **Helibeam System** - page 21 **BowTie** & **BowTie HD** - p24
Repair Details: BW01 - BW03

Securing Parapet Walls

There are multiple parapet wall constructions, on building roofs and bridges, with both cavity and solid walls being common. If they are cracked or unstable they can be repaired, strengthened and reconnected using a combination of Helifix remedial products.

Generally, masonry beams are created using the existing substrate, even on curved parapets, together with lateral masonry tying. In addition, grouted CemTies are normally installed vertically down through the coping stones into both masonry leaves and at an angle though the wall to secure it to the roof or bridge deck.

Products required: **Helibeam System** - page 21 **CemTie** - p25
Repair Details: PW01 - PW03

Creating Movement Joints

Where movement joints have been omitted and masonry cracking has resulted, Helifix has a simple cost-effective solution.

Short HeliBars are resin bonded across a new movement joint, with a plastic sleeve on alternate ends, to create an effective, low cost solution.

Products required: **HeliBar** - page 22 **DryFix** - p23
Repair Details: MJ01 - MJ03

Full details of all applications and repairs are available at: **www.helifix.co.uk/downloads**

Products

Helifix products are made from high tensile Grade 304 (1.4301) or 316 (1.4401) stainless steel to a unique helical design. This creates a slim profile with a large surface area that ensures a secure and lasting connection, with or without grouts or resins, in bricks, blocks, stone, concrete and timber as well as local building materials. It also means all products have great axial strength combined with flexibility which allows natural structural movement and avoids the introduction of any additional stresses.

These simple, yet highly effective, one piece products are quick, easy and economical to install. Their self-tapping properties provide excellent holding power and avoid splitting timber or masonry. Where appropriate, they can be installed through insulation without significantly affecting its thermal properties and provide multiple cross-cavity drip points. Once installed, all products are fully concealed, leaving the building structurally secure but virtually unmarked.

- HeliBeam
- Crack Stitching Kit
- HeliBar
- HeliBond
- DryFix
- BowTie
- BowTie HD
- RetroTie
- ResiTie
- CemenTie
- CemTie
- PatchPin
- PolyPlus
- PolyPlus SF
- CrackBond
- Crack Injection Kit
- InSkew
- TurboFast
- Headed TurboFast
- TimTie
- TurboTie
- StarTie

The following pages outline the applications and benefits of the Helifix product range. Full product details and installation instructions, can be found at: **www.helifix.co.uk/products**

Helibeam System

A quick, simple, effective and permanent means of stabilising cracked masonry, Helifix crack stitching involves bonding stainless steel HeliBars into appropriate bed joints or cut slots in bricks, blocks or stonework, with HeliBond cementitious grout.

The composite action of the HeliBars and HeliBond grout provides great strength combined with structural flexibility to secure the masonry. Combinations of other Helifix ties and fixings, suitable for each situation, provide appropriate lateral and vertical restraint to complete the repairs and restore structural integrity.

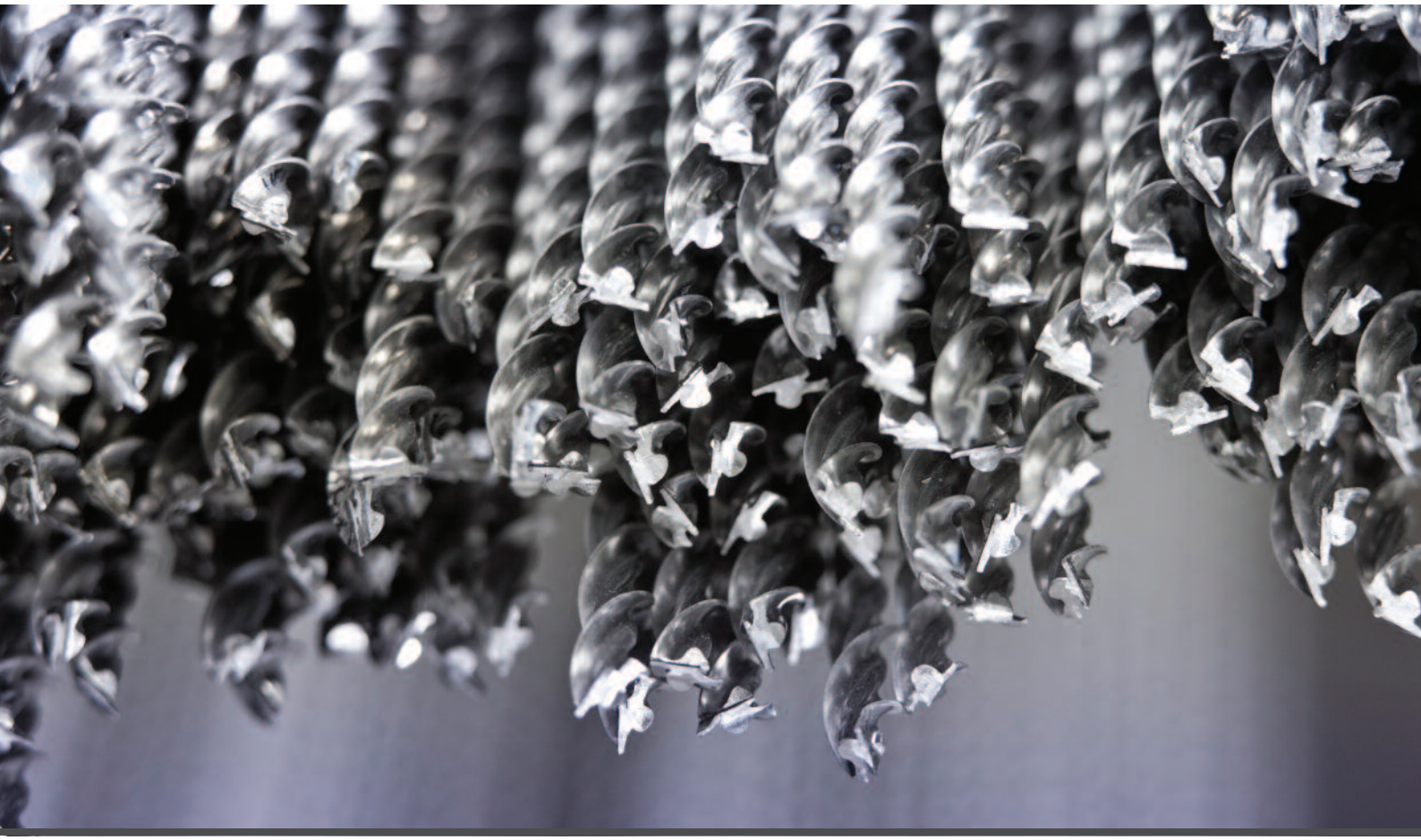
In many subsidence situations the Helibeam System, in conjunction with concrete pads or micro-piles under the building corners or at selected points, minimises or eliminates the need for expensive and extremely disruptive mass underpinning to provide an economical, non-disruptive solution.

- Effectively restores structural stability
- Extremely cost-effective
- Supports and distributes structural loads
- No further stresses introduced
- Accommodates normal structural movement
- Greatly simplifies lintel and window replacement
- Avoids expensive and disruptive dismantling and rebuilding
- Effective in all masonry structures

Crack Stitching

Repairing and stabilising cracked brickwork or stonework is best achieved by bonding HeliBars into appropriate bed joints or cut slots with HeliBond grout.

- Quick, simple, effective and permanent
- More reliable than crack injection methods
- Tensile loads are resisted within the masonry
- HeliBar and HeliBond grout combine to produce an excellent bond within the substrate
- Minimises chances of the crack developing or adjacent cracks occurring
- Accommodates natural building movement
- Non-disruptive structural stabilisation
- No additional stresses
- Avoids costly dismantling and rebuilding



HeliBar

HeliBar, with its relatively small helical cross-section, adds substantial tensile properties to the masonry when combined with HeliBond cementitious grout which locks between the fins in a composite action and bonds to the masonry. Consequently, HeliBars have a variety of remedial and new build applications.

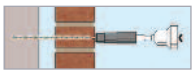
- Crack stitching
- Lintel repair and creation
- Forming deep masonry beams
- Horizontal structural restraint
- Creating new openings in existing masonry
- For reinforcing new build masonry
- Providing seismic upgrades

HeliBond

Injectable, cementitious grout.

- Non-shrink thixotropic grout
- Flows easily under pressure to fill voids
- Rapidly develops compressive strength
- Good working time
- Cures to 45N/mm^2 compressive strength after 28 days
- Ready-to-mix components supplied in two-pack sets to reduce waste

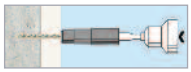
DryFix



Dry mechanical pinning and remedial tying system.

- Requires no resin, grout or mechanical expansion
- Highly economical with low installed costs
- Effective in bricks, blocks, concrete, hard mortar and timber
- Rapid, easy installation
- Requires only a small diameter pilot hole – easily made good
- Effective in cavity and solid walls, hollow materials and close to edges
- Usable in all weathers, temperatures and environments

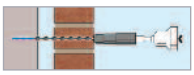
Render Pin



Stainless steel helical pin that rapidly secures separated render.

- Quick, economical and easy to install
- Avoids hacking off and re-rendering
- Accommodates differential movement
- Resists wind loads and ground vibrations
- Effective in all common building materials
- Minimal visual impairment
- May be installed by abseilers

Asymmetric Tie

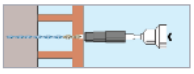


Secures relatively soft outer leaf material to harder inner leaf material.

A modified DryFix tie with a reduced diameter at the leading end for ease of installation into harder far leaf materials. Installed in the same manner as standard DryFix ties to provide a rapid, reliable and concealed solution.

- Does not stress or fracture fragile substrates
- Requires only a small diameter pilot hole
- No chemicals or expansion devices
- Usable in all weathers and temperatures

Terracotta Tie

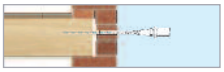


Secures fragile terracotta facings and delicate decorations and features which have become loose or are suffering from stress fractures.

It has a reduced diameter over the majority of its length with a short standard section at the outer end to grip the soft terracotta without enlarging the pilot hole. It is installed in the same manner as standard DryFix ties to provide a rapid, reliable and concealed solution.

- Does not stress or fracture fragile substrates
- Requires only a small diameter pilot hole
- No chemicals or expansion devices
- Usable in all weathers and temperatures

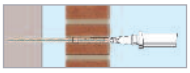
BowTie & BowTie HD



For restraining bowed walls.

- Used to stabilise bowed walls by securing them to internal floor joists
- Standard BowTies are recommended when installing into joist ends
- Very effective and economical solution
- Non-disruptive external installation
- Minimal inconvenience to occupants
- Visibly unobtrusive - no external plates
- No splitting of timbers
- BowTie HDs are recommended when installing into parallel joists:
  - heavy duty 12mm diameter with self-cutting end
  - mechanically connects to floor joists or roof beams
  - provides stiffness without the need to install noggins or additional bracing

RetroTie



Remedial wall tie with a mechanical fixing into the far leaf with resin bonding in the near leaf.

- Effective in all common building materials
- Far leaf security of fixing easily proof tested
- Minimal inconvenience to occupants

ResiTie

Remedial wall tie with a resin bond at both ends.

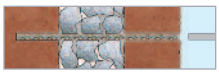
- Does not stress or fracture fragile substrates
- Requires only a small diameter clearance hole
- Multiple drip points prevent transfer of water across cavity
- Ideal for smaller projects

CemenTie

Remedial wall tie for use with thin wall far leaves and in buildings over four storeys high.

- Used where the far leaf is a thin wall hollow block or poor quality inner leaf
- Uses a grout-filled sock sleeve to provide a secure bond, grouted in both leaves

CemTie



Versatile grouted tie for stabilising all forms of solid masonry.

- Reconnecting separated internal and external building walls
- Lintel repairs
- Securing multi-layer brick rings in bridges, tunnels and arches
- Stabilising solid or rubble filled walls
- For repairing cracks near corners
- Securing delaminated masonry
- Repairing and securing parapets, cornices and decorative fascias
- Tie and grout installed simultaneously
- Suitable for overhead installations

PatchPin

Provides a strong mechanical key when patch repairing reinforced concrete.

- Forms powerful bond with patching mortar
- Additional mechanical bonding security
- Requires no chemicals
- Can be installed perpendicular or angled to the face and may be bent after installation
- Quick, simple and effective

Product details and installation instructions, can be found at: **www.helifix.co.uk/downloads**

PolyPlus

General purpose polyester resin.

- For securing remedial wall ties and resin bonded anchors
- Two part nozzle-mixed resin for consistent quality
- Clean and easy to use with all types of masonry
- 400ml part-usable cartridge

PolyPlus SF

Styrene-free polyester resin.

- For securing remedial wall ties and resin bonded anchors
- User-friendly styrene-free materials
- Usable in standard mastic gun
- Two part nozzle-mixed resin for consistent quality
- 300ml part-usable cartridge

CrackBond TE

General purpose epoxy resin.

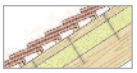
- For bonding cracked masonry, metal fixings and anchors
- Non-shrink thixotropic resin – cures within 24 hours
- Flows easily to fill cracks, 2mm-10mm, and voids
- Standard 250ml part-usable cartridge or 2.5 litre two-part-pack

Crack Injection Kit

A complete and easy to use, two component, fast curing epoxy system for repairing cracks in concrete.

- Convenient mix-in-the-nozzle cartridge system
- Cartridges fit standard application guns
- As strong as concrete when fully cured

InSkew



High performance timber fixing for pitched warm roof construction.

- Grade 304 (1.4301) stainless steel with excellent corrosion resistance
- Structurally more reliable than nails due to their helical one piece design
- More economical than traditional nails as far fewer are required
- Complies with Part L of the Building Regulations
- Recommended by all leading roof insulation manufacturers
- Withstands structural loads – tile weight and wind suction and compression
- Excellent holding power in both tension and compression
- Rapid hammer or power-driven installation
- Drives like a nail – holds like a screw
- Self-tapping action avoids batten bouncing
- No splitting of timbers or insulation compression
- Independently tested by TRADA
- Free in-house design service available

TurboFast

For securing timber or MDF to aircrete, bricks, stone and concrete.

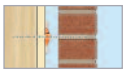
- Versatile multi-purpose headless fixing
- Drives like a nail - holds like a screw
- Great holding power, economical and reliable
- Rapid, easy, hammer or power-driven installation
- No splitting of blocks or timber
- Fewer fixings required

Headed TurboFast

High performance fixing for securing structural plywood composite insulation board on flat roofs.

- One-piece, helical fixing with large 20mm diameter head
- Rapid, easy, hammer-driven installation
- Minimises insulation compression
- Resists wind uplift forces
- Approved by major insulation suppliers

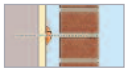
TimTie



For securing masonry to timber, through insulation, in timber frame construction.

- BS5268 Type 6 wall tie
- Driven directly into timber stud exactly where required
- Installed through insulation without affecting thermal properties
- Excellent holding power in timber and masonry
- No disturbance to newly laid brickwork or internal drywall fasteners

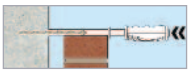
TurboTie



For securing outer leaf masonry to inner leaf aircrete blocks.

- Overcomes problems of misaligned or absent mortar beds and 'thin joint' bonds
- Rapid, easy, hammer or power-driven installation
- Can be installed through insulation
- No splitting or cracking of blocks or panels
- No disturbance to green masonry
- No pre-drilling of aircrete required; tie is simply driven home

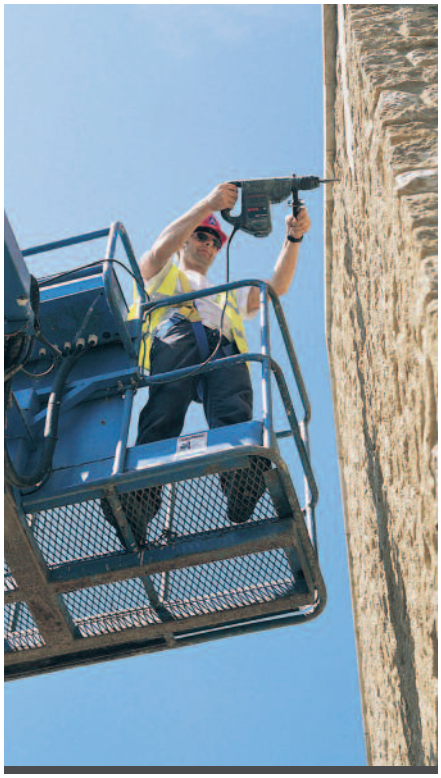
StarTie



For extending or securing a new leaf to an existing brick, stone or concrete wall.

- Secure mechanical connection – requires no grouts or resins
- Helical design ensures excellent connection without water transfer
- Nominal tie length accommodates cavity wander
- Rapid installation and cost effective

Full product details and installation instructions, can be found at: **www.helifix.co.uk/products**



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SUSTAINABLE STRUCTURAL SOLUTIONS

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