

HELIFIX

SUSTAINABLE STRUCTURAL SOLUTIONS

Principles, Products & Applications





We are one team. **We are Leviat.**

Leviat is the new name of CRH's construction accessories companies worldwide.

Under the Leviat brand, we have united the expertise, skills and resources of Ancon and its sister companies to create a world leader in fixing, connecting and anchoring technology.

The products you know and trust will remain an integral part of Leviat's comprehensive brand and product portfolio. As Leviat, we can offer you an extended range of specialist products and services, greater technical expertise, a larger and more agile supply chain and better, faster innovation.

By bringing together CRH's construction accessories family as one global organisation, we are better equipped to meet the needs of our customers, and the demands of construction projects, of any scale, anywhere in the world.

This is an exciting change. Join us on our journey.

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About Helifix

Helifix is the market leader in the design and manufacture of specialist helical wall ties, fixings and masonry repair systems. We are a technically-led organisation with an on-going product development programme backed by thorough independent testing.

Helifix has been at the forefront of technical innovation in the design and manufacture of construction ties, fixings and masonry repair systems for nearly 30 years. During this time we have built an enviable reputation for product quality, engineering excellence and customer service and support.

Our ties and fixings are precision engineered to our own unique Hi-Fin helical design and manufactured to ISO9001:2008 quality assured standards in our UK-based factory. Our non-disruptive and concealed repair strategies and techniques enable the repair and strengthening of existing masonry to be done sympathetically, avoiding expensive rebuilding and sustaining the existing built environment.

Helifix is part of the Construction Accessories division of CRH plc, the international building materials group. We have dedicated offices in the UK, USA, Australia and New Zealand, and affiliated distributors around the globe. Our products and construction techniques are used widely, in all types of structures from houses and tower blocks to churches, bridges and chimneys, and have produced cost-effective, non-disruptive solutions for all forms of masonry stabilisation in existing structures and secure, lasting connections in new build applications. Our products and techniques are highly regarded, well recognised and well proven through a long history of worldwide use.



HELIFIX TIES AND FIXINGS ARE:

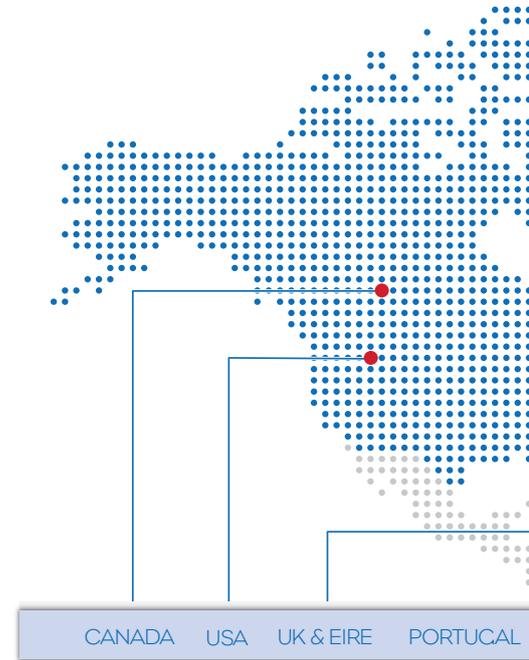
- Austenitic stainless steel
- Simple one-piece products
- Purpose-designed for specific applications
- Precision engineered to a unique helical Hi-Fin design
- Independently tested and approved
- Manufactured to ISO 9001:2008 quality assured standards in own UK-based factory
- Backed by technical support
- Flexible to accommodate normal structural movement
- Rapidly and easily installed
- Fully concealed once installed
- Able to produce excellent holding power in brick, block, stone, concrete, timber and local materials
- Suitable for most types of masonry structures from housing to tower blocks, churches to bridges
- Ideal for historic and listed buildings
- High quality, effective, reliable and economical

HELIFIX CHEMICALS ARE:

- Manufactured to ISO 9001:2008 quality controlled standards
- Provided with full material and technical support

SERVICE AND AVAILABILITY

All products are available for prompt delivery to site or office direct from Helifix. We are pleased to offer help and advice on the selection of the most suitable products and construction techniques for individual circumstances. We support our products with complete technical information and instruct on the correct installation of all the systems supplied.



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.

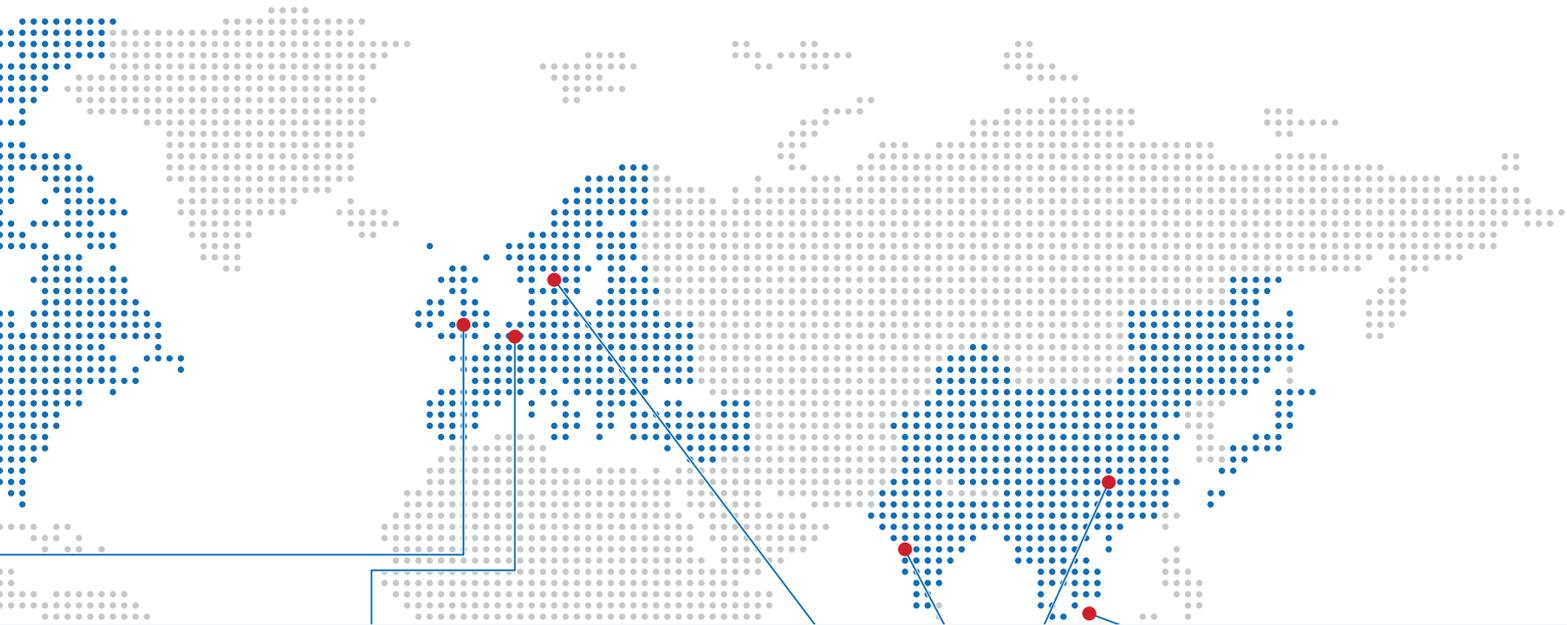
NATURAL HISTORY MUSEUM, LONDON, UK

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.



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

WRICLEY 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 the 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 revolutionary one-piece stainless steel helical tie which has become an accepted standard for the industry, and 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. They provide cost-effective, sympathetic solutions for all forms of masonry stabilisation in remedial situations and secure, lasting connections in new build applications.



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



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

1992
Helifix Australia begins trading. The Hellbeam System of structural beaming is developed, working with the BRE, Middlesex University, Curtins Consulting Engineers, and first used at RAF Northolt, UK. UK factory obtains 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, is developed.

InSkew warm roof batten fixing developed in collaboration with Celotex insulation.

1986
Factory is set up in Tyne & Wear, UK.

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 UK.

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

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

Research and Development

Until 1984, when the Building Research Establishment (UK) 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 universities in the UK, Australia, New Zealand and around the world, 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 UK factory, under the ISO 9001 quality assurance scheme, ensuring high levels of quality control and traceability.

1998

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

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.

Range of Applications

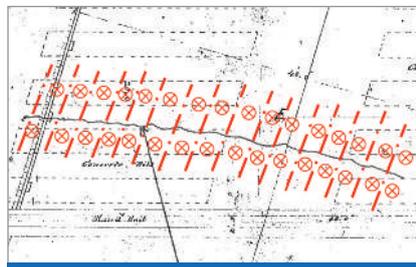


Residential, Western Australia
DryFix installation to resist high-wind loading

RESIDENTIAL

Helifix systems can be applied to a range of problems that often trouble residential buildings, including masonry cracking, failed wall ties, sagging lintels, bowing and separated walls, and subsidence related problems.

Masonry cracking and failure have many causes, and may contribute to problems varying from the purely aesthetic to structural, so it is important that the cause is identified and the design and implementation of appropriate remedial work is carried out.



Historic bridge, Christchurch, NZ
Longitudinal crack repair schedule

BRIDGES AND TUNNELS

Seismic events, age, weathering and increasing loads and stresses have, in numerous cases, led to problems on many masonry arch bridges and tunnels around Australasia. Many are historic structures and urgently require structural repairs and strengthening.

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



Historic terraces, Christchurch, NZ
DryFix cavity wall tie retrofit

HISTORIC STRUCTURES

Historic and listed buildings require reliable and sympathetic solutions that leave the structure secured but visually unaltered. Helifix has considerable experience of working with conservation professionals and bodies and on projects involving lime mortars, weak and unusual materials.

Helifix solutions retain the existing masonry and, due to the fully concealed nature of the products, leave the structure visually unmarked.

Helifix construction ties, fixings, repair and reinforcing systems provide secure, lasting connections in all forms of brick, block, concrete, stone and timber as well as traditional local building materials, and have proven effective in virtually every type of masonry structure from medieval churches to modern tower blocks, bridges and tunnels to domestic housing.



High rise, Sydney, Australia
DryFix and RetroTie wall tie retrofit

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. With rapid installation and the vast majority of work being undertaken externally, Helifix is able to keep disruption to an absolute minimum.



Hospital, Sydney, Australia
New build HeliBar

NEW BUILD

Helifix has developed highly regarded special purpose new build ties.

StarTie is an easy-to-use new build cavity and veneer wall tie.

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

HeliBar reinforcement helps new build masonry resist cracking and enables the construction of unusual masonry features.



Concrete Shear Wall, Christchurch, NZ
DryFix wall tie retrofit

SEISMIC RETROFIT

Upgrading buildings to meet seismic demands requires multi-faceted solutions and input from suitably qualified professionals.

Helifix remedial wall tie systems are used in seismic retrofit projects to tie masonry together or façades to structural elements, and to complement other retrofit solutions.

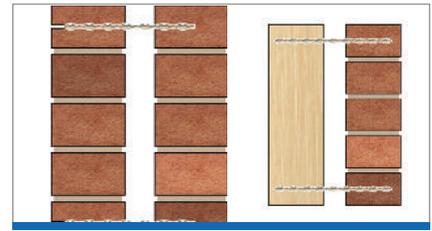
HeliBar bed-joint reinforcement is used to add strength and ductility.

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. Highlighted below are problems that affect every type of commercial and residential property of all ages and construction, together with commonly-used repair and reinforcement solutions.

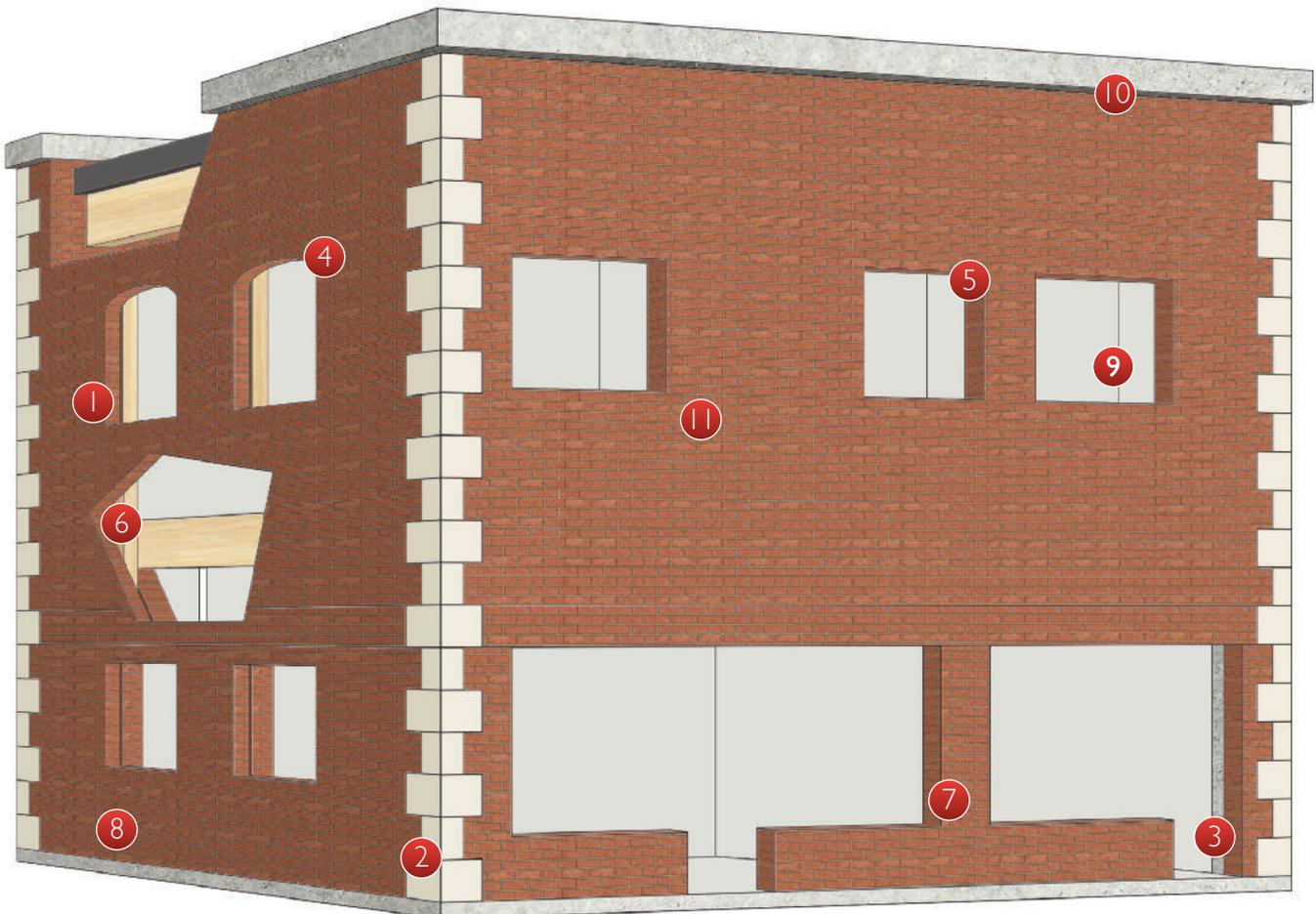
The illustration shows a two storey building of mixed veneer and solid masonry wall construction with a mono-pitch roof, and strategies for repairing common faults like cracked masonry, cracked concrete, separated walls and walls suffering from failed, omitted or inadequate wall ties. Also shown are a number of reinforcing applications which may complement or form part of wider strengthening projects.

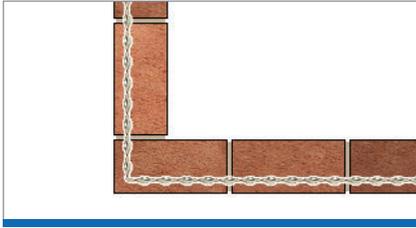
Clearly there are other situations not shown here, such as separated cornices, blown render and many more besides. By using appropriate combinations of Helifix ties, fixings and reinforcing rods virtually any situation can be resolved, so do not hesitate to call us to discuss your particular problem.



1 Tying walls

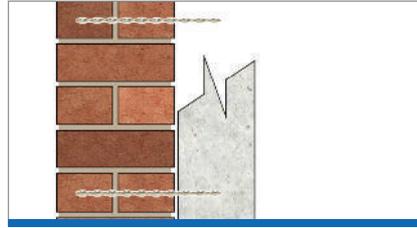
Remedial wall ties are installed to tie masonry leaves together or veneers to internal structural frames. Depending on construction type and site conditions, DryFix ties may be driven directly into each leaf, to provide a completely dry connection; or ResiTies may be bonded into clearance holes to provide a resin-based fix at both ends of each installed tie; or RetroTies may be driven into a pilot hole in the remote leaf, via a clearance hole in the near leaf into which they are resin bonded, to provide a dry/resin combination fix.





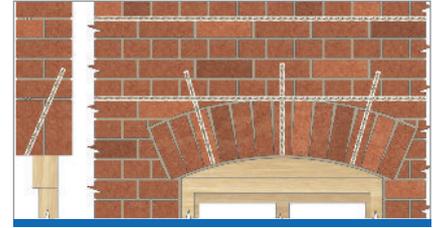
2 Tying corners

Lengths of HeliBar are bent and bonded into slots cut into the near and return wall at predetermined intervals with HeliBond grout.



3 Tying masonry to new concrete

DryFix ties are installed directly into the wall via a small pilot hole. The tail of the tie is left exposed to be covered by the newly applied concrete.



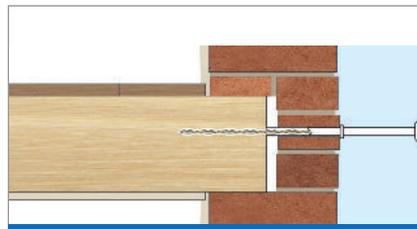
4 Repairing brick arch lintels

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



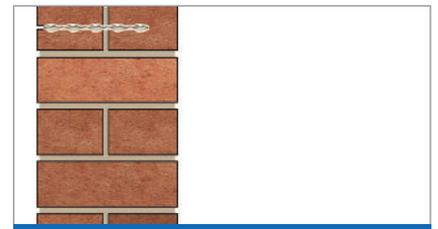
5 Tying intersecting walls

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



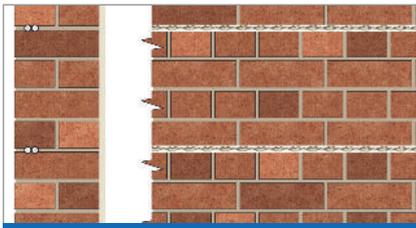
6 Tying walls to joist sides

BowTies are inserted through clearance holes in the masonry and power driven into the joist before the end is bonded into the masonry with epoxy resin.



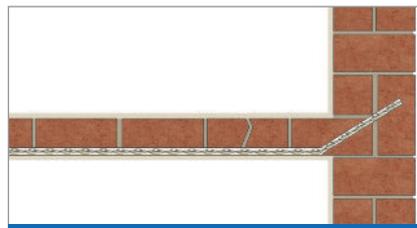
7 Pinning multi-leaf masonry

DryFix ties, CemTies or ResiTies, depending on requirements, are installed directly into the wall at regular intervals. DryFix ties are driven directly into the wall, via small pilot holes. CemTies and ResiTies are installed into clearance holes with HeliBond grout or EpoxyPlus resin respectively.



8 Creating masonry beams

Parallel lengths of HeliBar reinforcement are bonded into predetermined cut slots (normally cut into the mortar beds) using HeliBond grout to form deep masonry beams which distribute the building loads. HeliBeams may be used to resist both vertical and lateral loads.



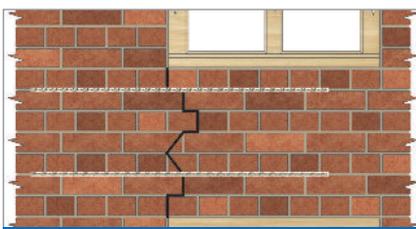
9 Reconnecting walls

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 epoxy resin and the remainder grouted with HeliBond cementitious grout into the internal wall.



10 Parapet repairs

CemTies are installed simultaneously with HeliBond grout into clearance holes drilled down into the wall to the required depth. Parallel lengths of HeliBar reinforcement are bonded into predetermined cut slots (normally cut into the mortar beds) with HeliBond grout to tie the masonry together and form masonry beams. DryFix ties and BowTies are installed wherever possible to tie the masonry to joists and timber frames to complement and further reinforce any other lateral restraint systems used.



11 Crack stitching

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

For more information please visit:

www.helifix.com.au

or

www.helifix.co.nz

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.

Full details of all applications and repairs are available at:
www.helifix.com.au and **www.helifix.co.nz**

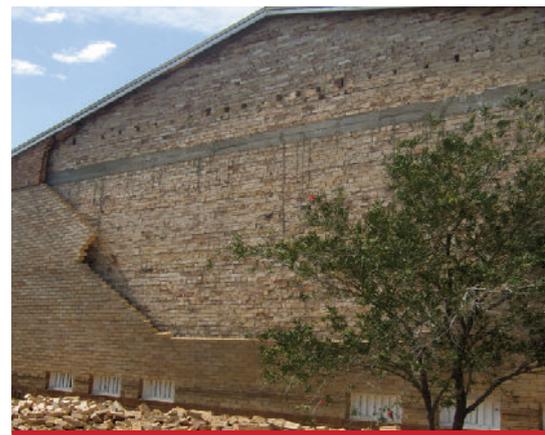


Retrofitting wall ties

Wall tie failure and inadequacy, if not addressed, can lead to catastrophic collapse. Wall tie corrosion is a common cause of wall tie failure in coastal areas. Walls suffering from failed, omitted or inadequate wall tie systems are most vulnerable during high winds and seismic events.

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 and ResiTies are resin-bonded at both ends.

Products required: **DryFix** - **RetroTie** - **ResiTie**



Crack stitching

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

HeliBar and HeliBond 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** - **HeliBond**





Tying walls to floor and roof joists

Strengthening and bowed wall rectification projects require walls to be connected to roof and floor diaphragms. BowTies are used to secure walls to internal floor or roof joists.

Easy external installation means minimal inconvenience for the occupants while providing an unobtrusive connection with no external plates. Standard BowTies are used when securing the wall into joist ends. The BowTie is inserted through a clearance hole in the wall and power-driven into position before being resin bonded into the masonry.

Products required: **BowTie**



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: **HeliBar - CemTie**



Creating masonry beams

The Helibeam System uses pairs of long HeliBars bonded with HeliBond grout into cut slots to form deep masonry beams from the existing masonry. These masonry beams reinforce and stabilise the existing masonry while redistributing the structural loads. Their composite action provides great strength combined with structural flexibility, while other ties and fixings provide appropriate lateral and vertical restraint.

Helibeam creation is fast and uncomplicated and used to add strength, ductility and resilience to unreinforced masonry. Beams may be created to provide structural support to failed lintels, unstable, weak, vulnerable or weathered masonry, or masonry stressed by building subsidence.

Products required: **Helibeam System**



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, stability is provided by installing CemTies or DryFix ties up and through the 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.

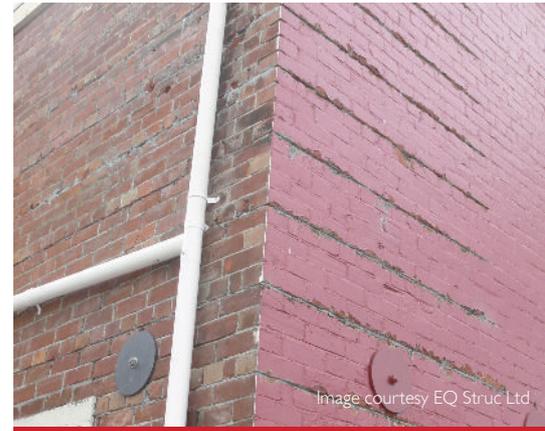
Products required: **Helibeam - CemTie - DryFix**

Adding strength and ductility

Improving the ability of buildings and building elements to deform without collapsing is an important part of seismic strengthening programmes. HeliBar bonded with HeliBond grout into slots cut into masonry can help improve ductility by holding the masonry together and distributing stresses over larger areas.

HeliBar installation is fast and uncomplicated, and requires minimal disruption and architectural alteration. HeliBars are manufactured from stainless steel for high corrosion resistance, and may be bent and manipulated on site to provide additional anchorage where required and to follow contours and corners. The Hi-Fin helical profile ensures excellent mechanical bonding with HeliBond cementitious grout over short distances.

Products required: **HeliBar**



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 - CemTie**



Tying veneers to new structural walls

Walls may need to be replaced and others added to achieve numerous objectives. In many cases, internal or structural masonry walls may need to be replaced or strengthened to improve seismic performance.

Helifix remedial ties are effective in bricks, blocks, concrete, hard mortar and timber and can be used to tie a variety of different materials together. DryFix ties, for instance, can be used to tie timber to masonry or masonry to new structural concrete.

Products required: **DryFix**



Full details of all applications and strategies are available at:
www.helifix.com.au or www.helifix.co.nz

Products

Helifix ties and fixings are made from high tensile Grade 304 or 316 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.

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.com.au/products and **www.helifix.co.nz/products**



Helibeam System

The Helibeam System uses pairs of long HeliBars bonded with HeliBond grout into cut slots to form deep masonry beams from the existing masonry.

These masonry beams reinforce and stabilise the existing masonry while redistributing the structural loads. Their composite action provides great strength combined with structural flexibility, while other ties and fixings provide appropriate lateral and vertical restraint.

- Effectively restores structural stability
- Extremely cost-effective
- Supports and distributes structural loads
- No further stresses introduced
- Accommodates normal structural movement

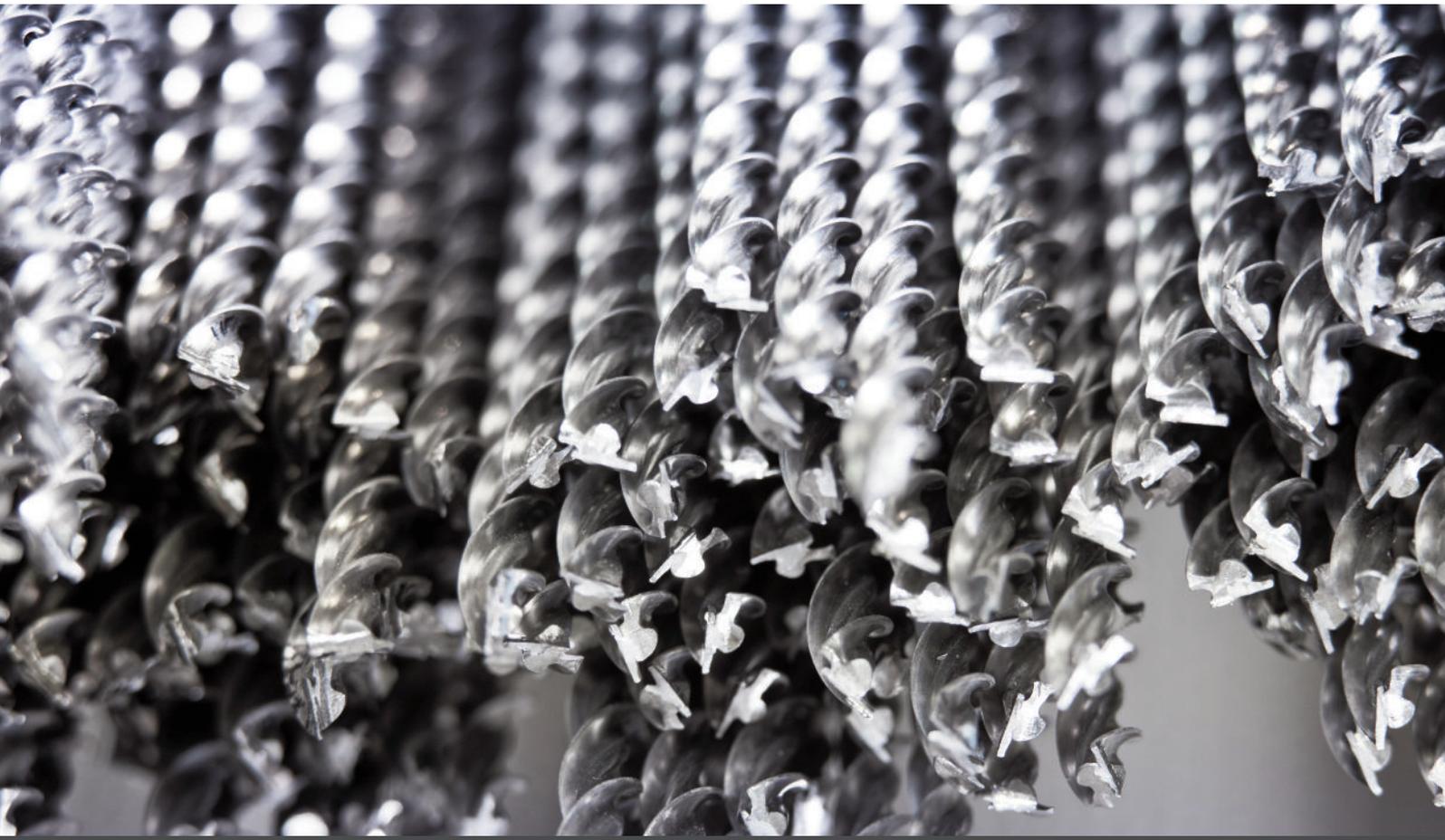
Helibeam creation is fast and uncomplicated and used to add strength, ductility and resilience to unreinforced masonry. Beams may be created to provide structural support to failed lintels, unstable, weak, vulnerable or weathered masonry, or masonry stressed by building subsidence.

- Greatly simplifies lintel and window replacement
- Avoids expensive and disruptive dismantling and rebuilding
- Effective in all masonry structures

PRODUCT SPECIFICATIONS

Material	Austenitic stainless steel Grade 316 HeliBar as standard (Grade 304 available)
Diameter	6.0mm (8.0 and 10.0mm available)
Standard Lengths	Up to 7m.
Required Length	To suit. HeliBars may be overlapped to suit spans in excess of 7m.
Bonding agent	HeliBond Cementitious Grout





HeliBar

HeliBar is a helical stainless steel reinforcing bar used for strengthening and stabilising new build and existing masonry. HeliBar starts as round stainless steel wire with a typical 0.2% proof stress of 500MPa but after the cold forming manufacturing process that creates the helical design, this increases to around 1000MPa.

HeliBars provide substantial tensile properties to masonry when bonded with HeliBond grout, which is able to lock tightly between the fins and to the masonry. Consequently, HeliBars have a variety of remedial and new build applications.

- Crack stitching
- Forming deep masonry beams
- Tying corners and wall junctions
- Reconnecting separated walls
- Lintel stabilisation and creation
- Horizontal structural restraint
- Reinforcing new build masonry
- Providing seismic upgrades

CHARACTERISTIC MATERIAL PROPERTIES

HeliBar Diameter	6.0mm	8.0mm	10.0mm
Product Code	HBR60	HBR80	HBR10
Cross Sectional Area (mm ²)	8.1	10.0	15.0
Stock Length (m)	7.0	7.0	7.0
Pitch (mm)	29	39	45
Ultimate Tensile Strength (MPa)	1112	1100	1088
Tensile Strength (kN)	9.5	11.4	16.7
0.2% Proof Stress (MPa)	840	860	770
Shear Strength — Averaged (MPa)	650	700	750
Grade of Stainless Steel	ASTM316	ASTM316	ASTM316
Weight (g/m)	58	80	120



STEP 1 Cut slots into the masonry to a minimum of 500mm either side of the crack and to the specified depth.



STEP 2 Clean out slots with a blow pump and apply HeliPrimer WB or flush with water.



STEP 3 Using a Helifix Pointing Gun, inject a bead of HeliBond to the back of the slot.



STEP 4 Using a finger trowel, or similar, push the HeliBar into the grout to obtain good coverage.



STEP 5 Insert a further bead of HeliBond over the exposed HeliBar, finishing 10-15mm from the face, and 'iron' into the slot using a finger trowel.



STEP 6 Repoint the mortar bed with a suitable mortar and make good the vertical crack with an epoxy-based weatherproof filler, e.g. CrackBond TE.

Crack Stitching

Crack Stitching is a method of repairing and stabilising cracked masonry using HeliBars bonded into cut slots with HeliBond cementitious grout.

Masonry may move and crack as a result of movement in foundation soils, seismic activity and cyclical wet and dry, hot and cold environmental conditions. Crack Stitching reintroduces structural integrity and redistributes structural loads for a quick, simple, effective and permanent solution.

- Quick, simple, effective and permanent
- More effective in brick/block masonry than simple crack injection
- Suitable for all types of masonry including listed and historic structures and those with lime mortar
- Fully concealed, non-disruptive repair system
- Stainless steel HeliBars and non-shrink HeliBond grout combine to create excellent tensile strength within the masonry
- Tensile loads are redistributed along the masonry
- Masonry remains flexible enough to accommodate natural building movement

BONDING AGENT

- HeliBond cementitious grout

SPECIFICATION NOTES

- HeliBar diameter 6mm as standard.
- Depth of slot and slot spacing as below.
- Height of slot to equal mortar joint height, with a minimum of 8mm.
- HeliBar to be long enough to extend a minimum of 500mm either side of the crack or 500mm beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.
- For solid masonry in excess of 230mm and in a cavity wall where both leaves are cracked, the wall must be crack stitched on both sides.
- Where a crack is less than 500mm from the end of a wall or an opening, the HeliBar is to be continued for at least 200mm around the corner and bonded into the adjoining wall or bent back and fixed into the reveal, avoiding any DPC.

SLOT DEPTH AND VERTICAL SPACING

	Single Leaf	Solid / Multi-Leaf Masonry		
		Up to 110mm	110 to 230mm	Over 230mm
Slot Depth	25-35mm	25-40mm	25-40mm	On both sides
Vertical Spacing	Every 4 - 6 brick courses (340 - 450 mm approx.)			





DryFix

DryFix is a versatile and rapidly installed mechanical pinning and remedial tying system that requires no resin, grout or mechanical expansion.

APPLICATIONS

- Replacement wall tie
- Securing multiple layers of masonry
- Pinning delicate masonry features
- Pinning render and thin panels
- Seismic retrofit of masonry walls

FEATURES AND BENEFITS

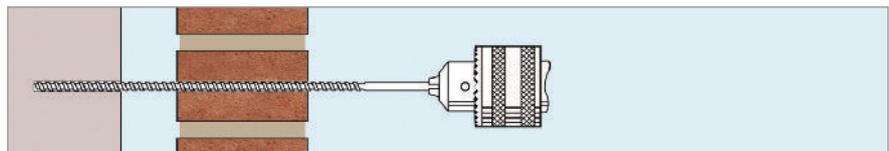
- Austenitic stainless steel tie
- Slim, self-tapping, one-piece design
- Hi-Fin helical profile for optimal mechanical connection
- Flexibility to accommodate natural building movement
- Highly economical and easy to install
- Far and near leaf security of fixing easily proof tested
- Multiple drip points prevent cross-cavity water transfer
- Leaves masonry virtually unmarked
- Minimal inconvenience to occupants

BONDING AGENT

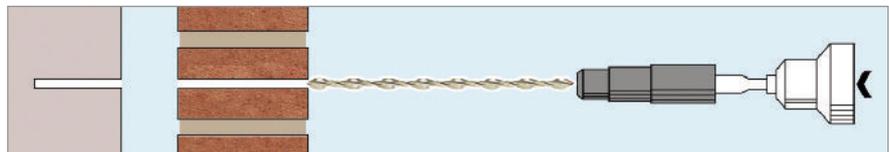
- None required

INSTALLATION

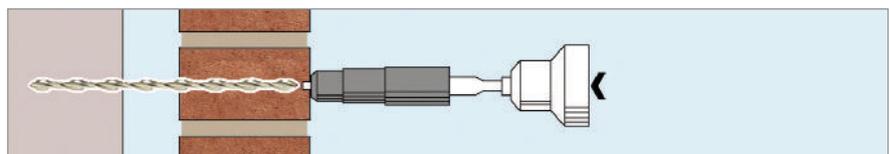
EXAMPLE Tying a cavity wall



STEP 1 Drill a small pilot hole, typically 5mm diameter, using a rotary percussion drill, 3-jaw-chuck type.



STEP 2 Load a DryFix tie into a Power Driver Attachment fitted to an SDS hammer drill.



STEP 3 Support the Power Driver Attachment with one hand, leaving the other to operate the drill, and drive the tie into the hole until the outer end is fully recessed below the face of the masonry.

PRODUCT SPECIFICATIONS

Diameter	8mm standard (10mm and Asymmetric DryFix available)
Standard Lengths	50 — 350mm
Required Length	Near leaf thickness less 10mm + cavity width + far leaf penetration, typically 70mm (Refer to Installation Detail for further instruction)
Depth of pilot hole	Length of DryFix + 10mm
Bonding agent	None required

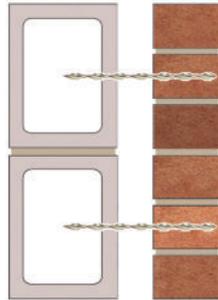
REFERENCE BPIR Remedial Wall Tie Information Sheet



DryFix render & thin panel pin

Short DryFix versions (including 50, 70 and 90mm) are available for re-pinning separated, unstable and potentially dangerous loose render and thin panels. DryFix may also be used to secure Helifix stainless steel render mesh.

REFERENCE Detail RP01



Brick – Hollow Block

REFERENCE Detail RT06



Stone – Concrete using asymmetric DryFix

REFERENCE Detail RT04

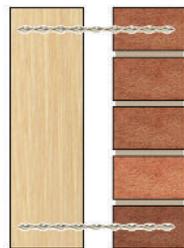
Asymmetric DryFix

A special asymmetric DryFix version is available for particular applications. The asymmetric tie has a long standard diameter section and a short reduced diameter section. The asymmetric DryFix tie is ideally suited to securing soft or delicate near leaf materials to a hard far leaf material, such as concrete or hard brick.



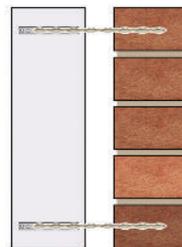
Solid (multi-leaf) masonry

REFERENCE Detail RT05



Veneer – Timber Frame

REFERENCE Detail RT08



Veneer – Steel Frame using DryFix and DryLink
REFERENCE Detail RP09



Load Test Unit

For use with Helifix ties and fixings, the 3kN Load Test Unit, with collet key, allows easy and accurate on-site random testing for security of fixing.

REFERENCE Load Test Unit Product Information sheet

Helifix Support and Installation Tools

Helifix manufactures a full range of tough, durable, hand-held and power-driven tools to support all our various ties and fixings during installation and enable quick and easy fixing without buckling or bending.

REFERENCE PDA Product Information sheet



BowTie

BowTie is a wall tie system for connecting masonry walls to internal timber joists.

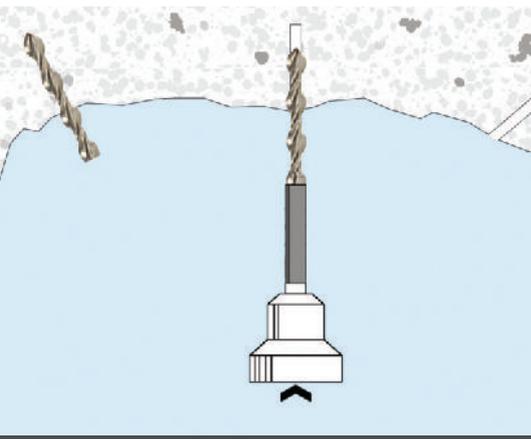
Standard BowTie installation involves driving one end of a self-tapping, stainless steel, helical tie through the wall and into the end-on joist to a minimum depth of 75mm.

PRODUCT SPECIFICATIONS

Material	Austenitic stainless steel Grade 316 as standard (Grade 304 available)
Diameter	8.0mm standard (10.0mm available)
Standard Lengths	Lengths up to 350mm
Required Length	Sufficient to penetrate minimum 75mm into joist end grain
Bonding agent	Epoxy in masonry only

REFERENCE BPIR Remedial Wall Tie Information Sheet





PatchPin

PatchPin is a short stainless steel helical pin that provides a strong mechanical key when patch repairing reinforced concrete.

- One-piece, austenitic stainless steel pin
- Hi-Fin helical profile for optimal mechanical connection, without expansion, in the substrate material
- Quick and easy installation
- Helical design to ensure positive bond between the patching material and the substrate
- Can be installed straight, angled or bent
- Requires no chemicals



StarTie

StarTie is a wall tie for new build cavity and veneer construction. StarTies are quick and easy to install and engineered from austenitic stainless steel Grade 316 as standard. StarTie installation tested to AS/NZS2699 and cover durability classifications R2, R3 and R4.

- New build cavity and veneer wall construction
- Connecting a new masonry leaf to an existing wall or frame
- Securing a new wall, wall extension or section to an existing wall
- Stainless steel, self-tapping, one-piece tie
- Multiple drip points prevent cross-cavity water transfer
- Excellent stress free mechanical connection and mortar bond
- Can be installed through insulation without significantly adversely affecting its thermal performance

REFERENCE

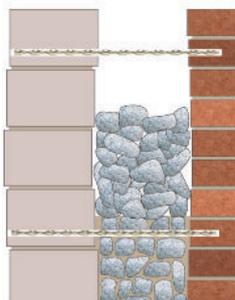
BPIR StarTie Product Information Sheet

CemTie

CemTie is a fully grouted reinforcement tie suitable for use in a variety of situations including: fractured solid masonry, bonding wall junctions, restraining separated or leaning walls, stabilising masonry arches and securing bulging solid or rubble-filled walls. CemTie installation involves bonding pre-cut lengths of HeliBar with HeliBond grout into clearance holes drilled into the affected masonry.

- Austenitic stainless steel tie, up to 1200mm long as standard
- Stress-free by accommodating normal structural movement
- Quick and easy installation
- Tie and grout installed simultaneously
- Ideal for overhead installations
- Cost-effective masonry repair technique
- Minimal disturbance to building fabric for sympathetic repairs

- CemTie plus HeliBond grout produces great tensile strength while retaining rotational flexibility



PRODUCT SPECIFICATIONS

Material	Austenitic stainless steel Grade 316 as standard (Grade 304 available)
Diameter	8.0 and 10.0mm standard
Standard Lengths	Lengths up to 1000mm
Required Length	50mm less than the materials being tied
Bonding agent	HeliBond Cementitious Grout

HeliBond

Injectable, non-shrink cementitious grout

HeliBond cementitious grout is a high performance, non-shrink, non-gassing, thixotropic cement based grout for bonding metal components into common masonry-type substrates. Suitable for injecting with a hand-operated or pneumatic applicator. Use with HeliPrimer when working with porous substrates.

Characteristic HeliBond Data	
Compressive Strength	
2 days	15MPa
28 days	45MPa
Pot life	2 hours at 20°C
PACK SIZE	3.0 and 4.5 litres
REFERENCE HeliBond Product Information Sheet	

HeliBond Applicators

Manual applicator for HeliBond and low viscosity pointing and grouting materials.



CrackBond TE

Pure epoxy anchoring mortar

CrackBond TE is a non-shrink, pure epoxy resin that is ideal for bonding cracked masonry. Crack width 2mm-20mm.

EpoxyPlus TE

Pure epoxy anchoring mortar

EpoxyPlus TE is a high performance, non-shrink, pure epoxy resin that is ideal for bonding metal components into masonry, concrete and rock.

Resin Cartridge Applicators

Manual applicator guns suitable for dual component, single-cartridge, side-by-side cartridge, low, medium and high viscosity materials.

EpoxyPlus EX

Seismically-qualified, high performance chemical anchor for threaded bars and reinforcing bars

EpoxyPlus EX is a two component chemical anchoring system for threaded bars and reinforcing bars in cracked and non-cracked concrete, solid masonry, hard natural stone and solid rock.

EpoxyPlus EX has been tested in accordance with US standard AC308 for recognition under the IBC / IRC codes to resist seismic actions in Seismic Design Categories A – F.



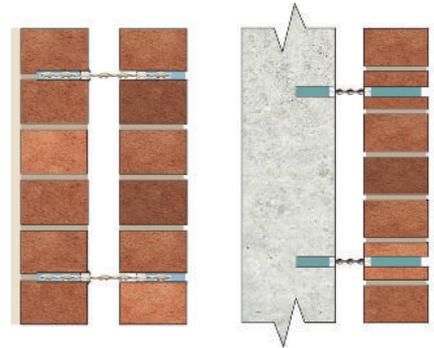


ResiTie

ResiTie is a remedial wall tie, used where a resin bond is required at both tie ends.

ResiTies are ideally suited for use in situations not otherwise suited to mechanical pinning or for use in small quantities minimising specialised tooling requirements.

ResiTies are easy to install and engineered from austenitic stainless steel, Grade 316 as standard. They are suitable for use in cavity and solid masonry construction. Installation involves bonding a ResiTie into a pre-drilled clearance hole with EpoxyPlus resin.



PRODUCT SPECIFICATIONS

Material	Austenitic stainless steel Grade 316 as standard (Grade 304 available)
Diameter	8.0mm standard (10.0mm available)
Standard Lengths	Standard lengths up to 350mm
Required Length	Minimum 3/4 of near leaf thickness + cavity width + minimum 55mm far leaf penetration
Bonding agent	EpoxyPlus or CrackBond

REFERENCE BPIR Remedial Wall Tie Information Sheet

RetroTie

RetroTie is a stainless steel remedial wall tie which offers an inner leaf mechanical fixing and a resin bond in the outer leaf. It is effective in all common building materials.

- Remedial wall tie for situations where a dry/epoxy resin combination fixing is required
- Seismic retrofit of masonry walls
- Mechanical fixing, without expansion, in the far leaf
- Hi-Fin helical profile for optimal mechanical connection in the far leaf and optimal resin bond in the near leaf
- One-piece, austenitic stainless steel tie
- Far leaf security of fixing easily proof tested
- Multiple drip points prevent cross-cavity water transfer



PRODUCT SPECIFICATIONS

Material	Austenitic stainless steel Grade 316 as standard (Grade 304 available)
Diameter	8.0mm standard (10.0mm available)
Standard Lengths	Standard lengths up to 350mm
Required Length	Minimum 3/4 of near leaf thickness + cavity width + far leaf penetration depending on material, typically 70mm (Refer to Installation Detail for further instruction)
Bonding agent	Epoxy in near leaf only

REFERENCE BPIR Remedial Wall Tie Information Sheet

Product and installation details installation details available at:
www.helifix.com.au or www.helifix.co.nz

Installation

Installation details are available for all Helifix fixings, ties, repair and reinforcing strategies. Each detail comprises drawings, method statement and recommended tooling. The complete Helifix portfolio includes over 100 standard specifications covering crack stitching, wall tie retrofit, masonry arch and parapet repair, wall connection, masonry beam creation and more.

The following pages provide selected Helifix installation details. A full list of installation instructions, can be found and downloaded at:

www.helifix.com.au/downloads and **www.helifix.co.nz/downloads**

ANZ
CR01

Concrete patching using PatchPins

Product	Description	Code
PatchPin	Stainless steel pin for concrete patching	HPP

Method Statement

1. Clean the area to be patched. Remove all loose material and leave the surface ready to accept the patching material in accordance with the manufacturer's instructions.
2. Clean and treat any exposed, embedded steel.
3. Drill 6.5mm diameter holes into the concrete to the specified depth and at the specified spacing using an SDS rotary hammer drill.*
4. Fit the PatchPin support tool over the drill bit.
5. Load the PatchPin into the support tool.
6. Drive the PatchPin into the pre-drilled pilot hole with the SDS rotary hammer drill set to hammer only. Ensure that the outer end of the pin will be below the face of the concrete patch – the pin can be bent, if required.
7. Apply the patching mortar in accordance with the manufacturer's instructions.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear. Refer to the *Helifix Wall and Pinning Tie Safe Installation Guide* for further instruction.

RECOMMENDED TOOLING

For drillingSDS rotary hammer drill

For installation of PatchPinSDS rotary hammer drill
650/850w and PatchPin SupportTool

*SPECIFICATION NOTES

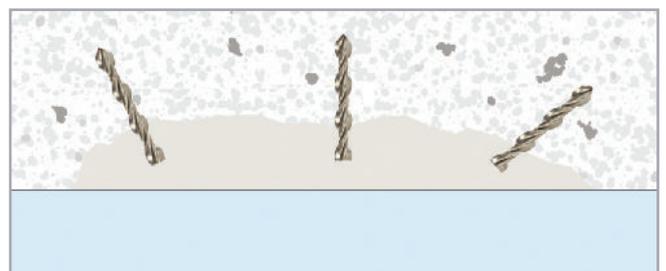
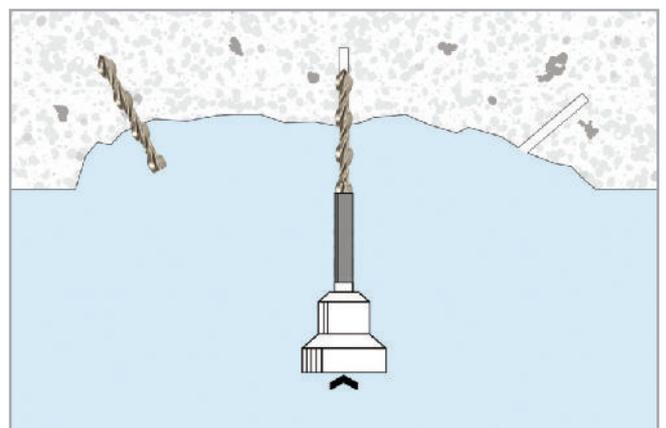
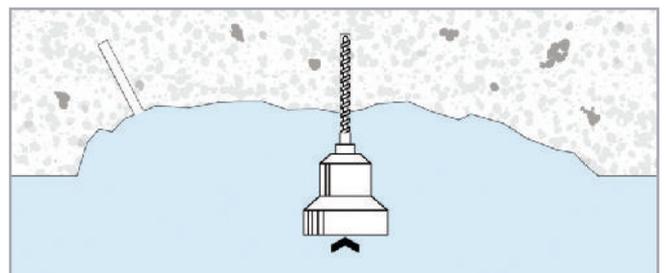
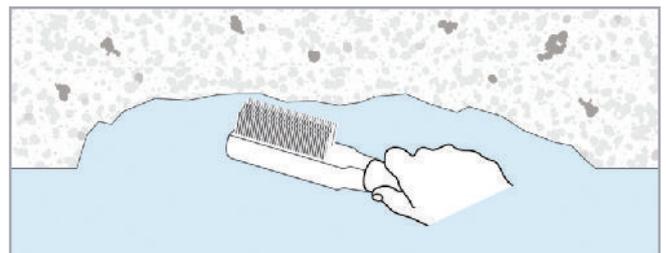
The following criteria are to be used unless specified otherwise:

- A. Pins should penetrate 30-50mm into the patched area, with harder materials requiring less penetration.
- B. Pin spacing and position may be varied to suit site conditions.
- C. Pins are to be installed approx. 50mm from the edge of the patched area.
- D. Intermediate pins should be at 150-200mm centres. Extra pins may be used at the discretion of the engineer / site management.
- E. Pins should be applied at not less than two pins per patch.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.



**ANZ
CS01**

Crack stitching a wall using HeliBars and HeliBond

Product	Description	Code
HeliBar	Helical stainless steel reinforcement	HBR
HeliBond	Injectable cementitious grout	HLB
CrackBond	Epoxy resin for filling cracks	HRT

Method Statement

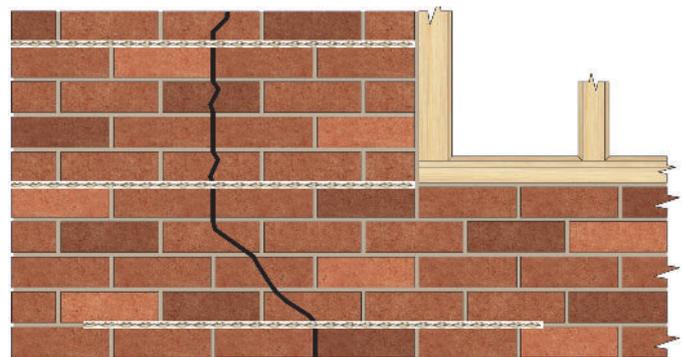
- Using an appropriate power cutting tool with vacuum attachment, cut slots into the horizontal mortar joints, to the specified depth and at the required vertical spacing.* Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond.
- Clean out all dust and loose mortar from the slots and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use a suitable primer. Ensure the slot is damp or primed prior to commencing step 5.
- Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.
- Fit the mortar nozzle to the pointing gun.
- Inject a bead of HeliBond grout, 10-15mm deep, into the back of the slot.
- Push the HeliBar into the grout to obtain good coverage.
- Inject a second bead of HeliBond grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond as necessary, leaving 10-15mm for new pointing.
- Point up the remaining slot with a suitable matching mortar. The crack within the wall should be waterproofed using an appropriate Helifix bonding agent or filler, e.g. HeliBond or CrackBond, depending on the width of the crack and the surface made good or left ready for any decoration.
- Clean tools with clean, fresh water.

NOTE. Pointing may be carried out as soon as is convenient after the HeliBond has started to gel. Ensure that pointing does not disturb the masonry/HeliBond connection.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear. Refer to the Helifix Wall and Pinning Tie Safe Installation Guide for further instruction.

SLOT DEPTH AND VERTICAL SPACING

	Single Leaf	Solid / Multi-Leaf Masonry		
		Up to 110mm	110 to 230mm	Over 230mm
Slot Depth	25-35mm	25-40mm	25-40mm	On both sides
Vertical Spacing	Every 4 - 6 brick courses (340-450mm approx.)			



RECOMMENDED TOOLING

- For cutting slotsChisel, mortar saw (e.g. Arbortech All Saw) or angle grinder with dust guard (e.g. C-Tec) and vacuum
- For mixing HeliBondDrill with mixing paddle
- For injection of HeliBond into slotsHelifix Pointing Gun with mortar nozzle
- For smoothing pointingStandard finger trowel

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- HeliBar diameter 6mm as standard.
- Depth of slot and slot spacing as per Depth and Spacing Guide.
- Height of slot to equal mortar joint height, with a minimum of 8mm.
- HeliBar to be long enough to extend a minimum of 500mm either side of the crack or 500mm beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.
- For solid masonry in excess of 230mm and in a cavity wall where both leaves are cracked, the wall must be crack stitched on both sides.
- Where a crack is less than 500mm from the end of a wall or an opening the HeliBar is to be continued for at least 200mm around the corner and bonded into the adjoining wall or bent back and fixed into the reveal, avoiding any DPC.
- In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the slot, or priming, should be carried out just prior to injecting the HeliBond grout.
- Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

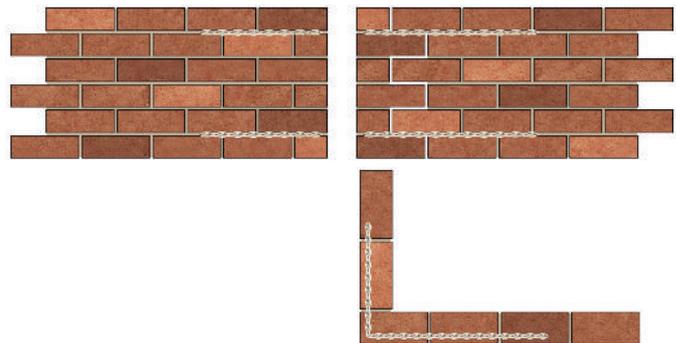
GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

**ANZ
CS03**

Stitching or strengthening corners using HeliBars and HeliBond

Product	Description	Code
HeliBar	Helical stainless steel reinforcement	HBR
HeliBond	Injectable cementitious grout	HLB
CrackBond	Epoxy resin for filling cracks	HRT



Method Statement

- Using an appropriate power cutting tool with vacuum attachment, cut slots into the horizontal mortar joints, to the specified depth and at the required vertical spacing.* Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond. If the wall is rendered and the mortar joints are not visible, cut the horizontal slots through the render and into the masonry. HeliBars and HeliBond must be installed in the masonry and never in the render.
- Clean out all dust and loose mortar from the slots and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use a suitable primer. Ensure the slot is damp or primed prior to commencing step 6.
- Cut the HeliBar to the required length and bend to fit slots.
- Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.
- Fit the mortar nozzle to the gun.
- Inject a bead of HeliBond grout, 10-15mm deep, into the back of the slot.
- Push the HeliBar into the grout to obtain good coverage.
- Inject a second bead of HeliBond grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond as necessary, leaving 10-15mm for new pointing.
- Point up the remaining slot with a suitable matching mortar. The crack within the wall should be waterproofed using an appropriate Helifix bonding agent or filler, e.g. HeliBond or CrackBond, depending on the width of the crack and the surface made good or left ready for any decoration.
- Clean tools with clean, fresh water.

NOTE. Pointing may be carried out as soon as is convenient after the HeliBond has started to gel. Ensure that pointing does not disturb the masonry/HeliBond connection.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.

RECOMMENDED TOOLING

- For cutting slotsChisel, mortar saw (e.g. Arbortech All Saw) or angle grinder with dust guard (e.g. C-Tec) and vacuum
- For mixing HeliBondDrill with mixing paddle
- For injection of HeliBond into slotsHelifix Pointing Gun with mortar nozzle
- For smoothing pointingStandard finger trowel

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- HeliBar diameter 6mm as standard.
- Depth of slot into the masonry to be 25mm to 35mm.
- Height of slot to equal mortar joint height, with a minimum of 8mm.
- HeliBar to be long enough to suit specific engineering design or extend a minimum of 500mm either side of any crack or 500mm beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.
- Normal vertical spacing is 340mm (4 brick courses).
- In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the slot, or priming, should be carried out just prior to injecting the HeliBond grout.
- Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

ANZ
CS10

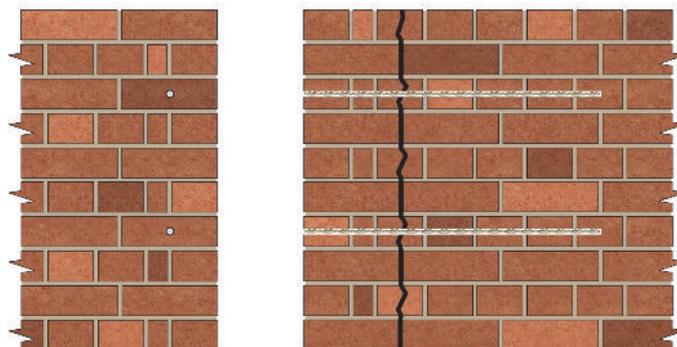
Repair of crack near a corner in a solid wall using CemTies

Product	Description	Code
CemTie	Helical HeliBar stainless steel pin	HBR
HeliBond	Injectable cementitious grout	HLB
CrackBond	Epoxy resin for filling cracks	HRT

Method Statement

1. Mark the points for CemTie installation on the face of the wall.*
2. Drill a 14mm clearance hole (16-18mm if CemTie 600mm or longer) through the outer wall to the required depth.*
3. Clean out all dust from the hole and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use primer. Ensure the hole is damp or primed prior to commencing step 8.
4. Attach the required length of CemTie pinning nozzle to the Helifix Pointing Gun so that the flared end of the pinning nozzle sits inside the cone.
5. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the gun.
6. Pump grout to fill the nozzle.
7. Wind the CemTie into the nozzle and ensure that it is fully covered in grout.
8. Insert the nozzle to the full depth of the drilled hole and pump the grout. Slowly withdraw the nozzle while pumping. The CemTie will be carried out with the HeliBond grout as it is forced through the nozzle. Back pressure will help to push the nozzle back out of the hole.
9. Make good all holes at the surface with matching materials. The crack within the wall should be waterproofed using an appropriate Helifix bonding agent or filler, e.g. HeliBond or CrackBond, depending on the width of the crack and the surface made good or left ready for any decoration..
10. Clean tools with clean, fresh water.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.



RECOMMENDED TOOLING

- For drillingSDSrotary hammer drill 650/850w
- For mixing HeliBondDrill with mixing paddle
- For injection of HeliBond into slotsHelifix Pointing Gun HD with CemTie pinning nozzle

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. CemTies are to be installed at a maximum vertical spacing of 425mm.
- B. CemTies are to extend an equal distance, and typically to not more than 500mm, either side of the crack.
- C. Depth of hole to be CemTie length + 25mm.
- D. Ensure the CemTies are installed into solid brick and not the mortar joints or loose rubble within the wall.
- E. If cracking occurs on both elevations consider using HeliBar crack stitching around the corner. If CemTies have to be used, they should be staggered between each elevation.
- F. In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the hole, or priming, should be carried out just prior to inserting the CemTie.
- G. Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

ANZ
LB04

Creating a masonry beam in solid, multi-leaf masonry using HeliBars

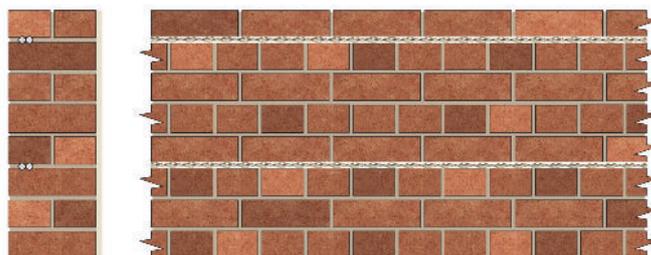
Product	Description	Code
HeliBar	Helical stainless steel reinforcement	HBR
HeliBond	Injectable cementitious grout	HLB

Method Statement

- Using an appropriate power cutting tool with vacuum attachment, cut slots into the horizontal mortar joints, to the specified depth and at the required vertical spacing.* If the wall is plastered/rendered and the mortar joints are not visible, cut the horizontal slots through any plaster/render and into the masonry. Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond.
- Clean out all dust and loose mortar from the slots and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use a suitable primer. Ensure the slot is damp or primed prior to commencing step 5.
- Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.
- Fit the mortar nozzle to the pointing gun.
- Inject a bead of HeliBond cementitious grout, 10-15mm deep, into the back of the slot.
- Push the first 6mm HeliBar into the grout to obtain good coverage.
- Inject a second bead of HeliBond grout over the exposed HeliBar.
- Push the second 6mm HeliBar into the grout to obtain good coverage.
- Inject a third bead of HeliBond grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond as necessary, leaving 10-15mm for new pointing.
- Point up the remaining slot with a suitable matching mortar.
- Clean tools with clean, fresh water.

NOTE. Pointing may be carried out as soon as is convenient after the HeliBond has started to gel. Ensure that pointing does not disturb the masonry/HeliBond connection.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.



RECOMMENDED TOOLING

- For cutting slotsChisel, mortar saw (e.g. Arbortech All Saw) or angle grinder with dust guard (e.g. C-Tec) and vacuum
- For mixing HeliBondDrill with mixing paddle
- For injection of HeliBond into slotsHelifix Pointing Gun with mortar nozzle
- For smoothing pointingStandard finger trowel

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A minimum of two HeliBars should be installed into each cut slot.
- Depth of slot into the masonry to be 55mm to 70mm + the thickness of any plaster or render.
- Height of slot to equal full mortar joint height, with a minimum of 8mm.
- If HeliBars are to be joined in a straight run, overlap the bars by a minimum of 500mm.
- Top and bottom reinforcements should be positioned as far apart as practicable, up to a maximum distance equivalent to 10 brick courses (approx. 850mm).
- Any fractures in the masonry within the 'beam zone' MUST be stabilised by crack stitching (see Repair Detail CS01), CrackBond or masonry replacement.
- Any missing or very poor quality masonry MUST be replaced.
- Install Helifix remedial wall ties if existing ties are defective in any way. Refer to Repair Details RT01-03 for details on Helifix remedial tie installation.
- Multiple HeliBars should be installed starting at the top and working down to the bottom.
- In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the slot, or priming, should be carried out just prior to injecting the HeliBond grout.
- Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

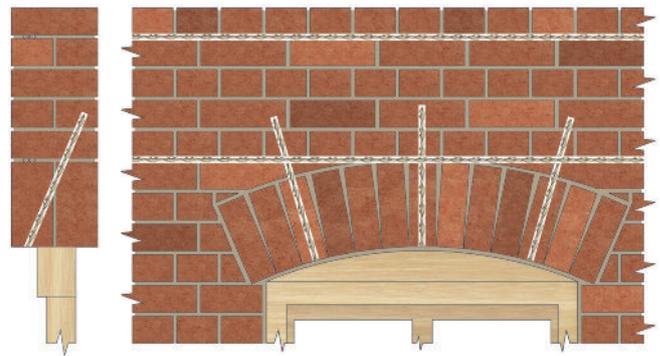
**ANZ
LR10**

Stabilising brick arch lintels using HeliBars and CemTies

Product	Description	Code
CemTie	Helical HeliBar stainless steel pin	HBR
HeliBar	Helical stainless steel reinforcement	HBR
HeliBond	Injectable cementitious grout	HLB

1. Using an appropriate power cutting tool with vacuum attachment, cut slots into the horizontal mortar joints, to the specified depth and at the required vertical spacing.* If the wall is plastered/rendered and the mortar joints are not visible, cut the horizontal slots through any plaster/render and into the masonry. Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond.
2. Mark the positions for the CemTie holes on the underside of the soldier course.
3. Drill 14mm clearance holes (16-18mm if CemTie 600mm or longer) at the required angle and to the specified depth.* The angle of drilling should be such that the hole will pass behind the lower HeliBars and penetrate at least 50mm into the course of masonry above the reinforcing.
4. Clean out all dust and loose mortar from the slots and holes and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use a suitable primer. Ensure the slot and holes are damp or primed prior to commencing steps 7 and 15.
5. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.
6. Fit the mortar nozzle to the pointing gun.
7. Inject a bead of HeliBond cementitious grout, 10-15mm deep, into the back of the slot.
8. Push the first 6mm HeliBar into the grout to obtain good coverage.
9. Inject a second bead of HeliBond grout over the exposed HeliBar.
10. Push the second 6mm HeliBar into the grout to obtain good coverage.
11. Inject a third bead of HeliBond grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond as necessary, leaving 10-15mm for new pointing.
12. Repeat steps 7 to 11 for the lower slot.
13. Attach the required length of CemTie pinning nozzle to the pointing gun and pump grout to fill the nozzle.
14. Wind the CemTie into the nozzle and ensure that it is fully covered in grout.
15. Insert the nozzle to the full depth of the drilled hole and pump the CemTie and grout.
16. Repeat steps 13 to 15 for each hole.
17. Make good the CemTie holes and point up the remaining slots with a suitable matching mortar.
18. Clean tools with clean, fresh water.

NOTE. Pointing may be carried out as soon as is convenient after the HeliBond has started to gel. Ensure that pointing does not disturb the masonry/HeliBond connection.



RECOMMENDED TOOLING

- For cutting slotsChisel, mortar saw (e.g. Arbortech All Saw) or angle grinder with dust guard (e.g. C-Tec) and vacuum
- For drillingSDSrotary hammer drill 650/850w
- For mixing HeliBondDrill with mixing paddle
- For insertion of the CemTiesHelifix Pointing Gun HD with CemTie pinning nozzle
- For injection of HeliBond into slotsPointing Gun with mortar nozzle
- For smoothing pointingStandard finger trowel

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. Depth of slot into masonry to 40mm to 55mm.
- B. Height of slot to equal full mortar joint height, with a minimum of 8mm.
- C. Top and bottom reinforcements should be positioned as far apart as practicable, up to a maximum distance equivalent to 10 brick courses (approx. 850mm).
- D. HeliBar to be long enough to extend a minimum of 500mm beyond each side of the opening.
- E. Any fractures in the masonry within the 'beam zone' MUST be stabilised by crack stitching (see Repair Detail CS01), CrackBond or masonry replacement.
- F. Any missing or very poor quality masonry MUST be replaced.
- G. CemTie length to be sufficient to penetrate at least 50mm into the course of masonry above the reinforcement.
- H. Depth of hole to be CemTie length + 25mm.
- I. In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the slots and holes, or priming, should be carried out just prior to injecting the HeliBond.
- J. Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

**ANZ
RB04**

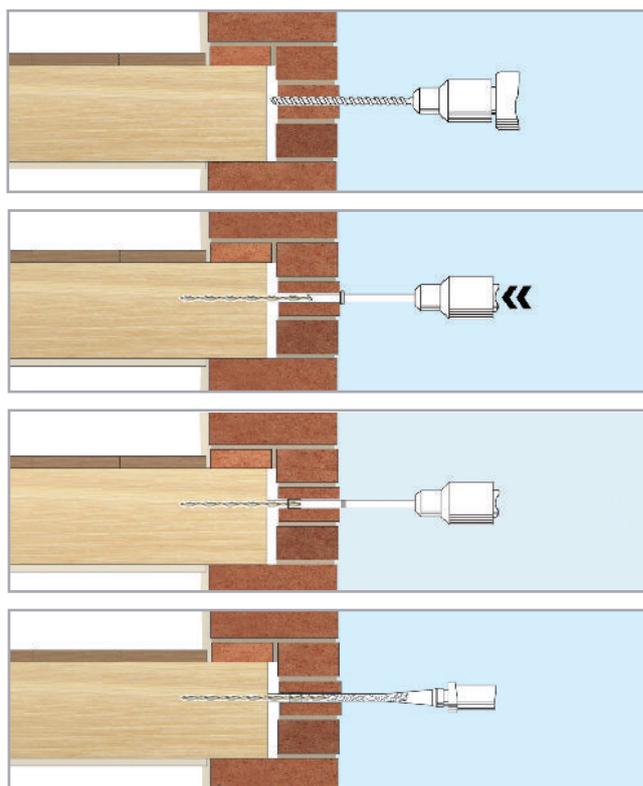
Tying walls to joist ends using BowTies

Product	Description	Code
BowTie	Grade 316 stainless steel helical wall tie	HDF
EpoxyPlus	Thixotropic pure epoxy resin	HRT

Method Statement

1. Mark the positions of the joists on the external wall.
2. Drill the clearance holes for the BowTies (normally 12mm diameter), through the masonry only, in line with the centre of the joists.
3. Clean out the hole to clear any dust or debris.
4. Fit the BowTie power support tool into an SDS rotary hammer drill and insert the BowTie into the support tool.
5. Drive the BowTie into the timber to the required depth.*
6. Place the sleeve over the tie and push it to the back of the hole in the masonry (use the power support tool).
7. Inject Helifix epoxy resin into the hole to fill it completely.
8. Allow the resin to gel (normally 15 to 20 minutes).
9. Make good all holes at the surface with brick dust or matching mortar or leave ready for any decoration.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.



RECOMMENDED TOOLING

For drilling and insertion of BowTie ...SDSrotary hammer drill 650/850w
 For installation of BowTieBowTie support tool
 For cleaning the clearance holeAirjet and brush
 For injection of EpoxyPlus resinApplicator gun with nozzle

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. BowTie penetration into the end grain of the timber joist must be a minimum of 75mm.
- B. Each joist in the area of concern is to be secured with a BowTie (i.e. spacing of BowTies is to correspond with the original joist spacing).
- C. Ensure that all joists into which BowTies are to be installed are both sound and secure.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

**ANZ
RF01**

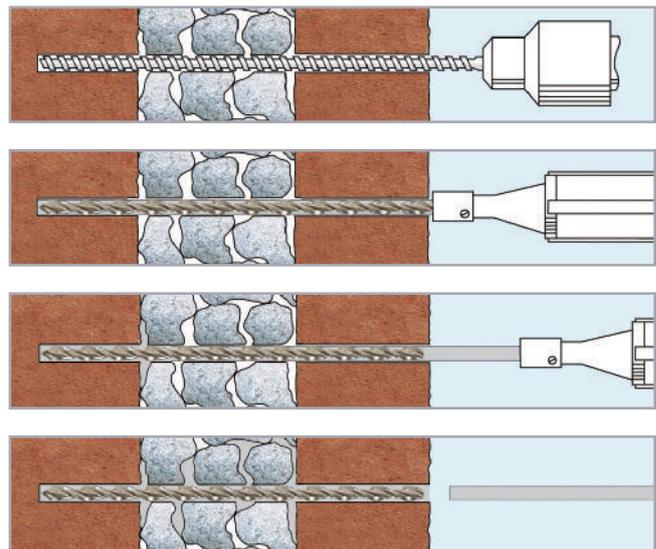
Pinning rubble-filled walls using CemTies

Product	Description	Code
CemTie	Helical HeliBar stainless steel pin	HBR
HeliBond	Injectable cementitious grout	HLB

Method Statement

1. Mark the points for CemTie insertion on the face of the wall.*
2. Drill a clearance hole at the required location and to the specified depth and diameter.*
3. Clean out all dust from the hole and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use a suitable primer. Ensure the hole is damp or primed prior to commencing step 8.
4. Attach the required length of CemTie Pinning Nozzle to the Helifix Pointing Gun so that the flared end of the pinning nozzle sits inside the cone.
5. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the gun.
6. Pump grout to fill the nozzle.
7. Wind the CemTie into the nozzle and ensure that it is fully covered in grout.
8. Insert the nozzle to the full depth of the drilled hole and pump the grout. Slowly withdraw the nozzle while pumping. The CemTie will be carried out with the HeliBond grout as it is forced through the nozzle. Back pressure will help to push the nozzle back out of the hole.
10. Make good the entry hole with matching materials.
11. Clean tools with clean, fresh water.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.



RECOMMENDED TOOLING

- For drillingSDSrotary hammer drill 650/850w
- For mixing HeliBondDrill with mixing paddle
- For insertion of the CemTiesHelifix Pointing Gun HD with CemTie pinning nozzle

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. CemTies are to be installed at a minimum density of approx. 2.8 ties/m² (approx. 600mm horizontal and 600mm vertical spacing).
- B. The density is to be increased around openings with ties placed at a maximum 300mm vertical spacing and 225mm back from the opening.
- C. CemTie length should equal 50mm less than all the materials being tied.
- D. Clearance hole diameter to be:

CemTie Length	Up to 600mm	600 to 1000mm	1000 to 1200mm
Drilled Hole Diameter	14mm	16-18mm	18mm

- E. Depth of hole to be CemTie length + 25mm.
- F. In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the hole should be carried out just prior to inserting the CemTie.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

ANZ
RT02

Wall tie retrofit using RetroTies

Product	Description	Code
RetroTie	Stainless steel helical remedial wall tie	HDF
EpoxyPlus	Thixotropic pure epoxy resin	HRT

Method Statement

1. Mark the points for RetroTie installation on the face of the wall.*
2. Drill a 5mm diameter pilot hole (subject to confirmation on site) through the near leaf and to the required depth into the back-up substrate.*
3. Widen the hole through the near leaf to 12mm diameter.
4. Clean the hole of spoil using a brush and airjet.
5. Fit the support tool to a light-weight SDS hammer drill set to a slow speed and hammer only.
6. Load the RetroTie into the support tool, insert through the near leaf, and drive home into the back-up substrate.
7. Place the end of the nozzle of the resin applicator over the exposed end of the RetroTie in the near leaf. Masking tape may be placed around the hole to protect the surface of the wall from resin spillage. Cloth may also be wrapped around the nozzle to help seal the opening during injection and protect the wall face from spillage.
8. Inject resin until the hole is filled.
9. Allow the resin to cure and make good.

NOTE. Avoid leaning or pushing heavily on the drill during operation to ensure the accuracy of the hole's diameter and to limit spalling of the near leaf as the drill breaks into the cavity.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.

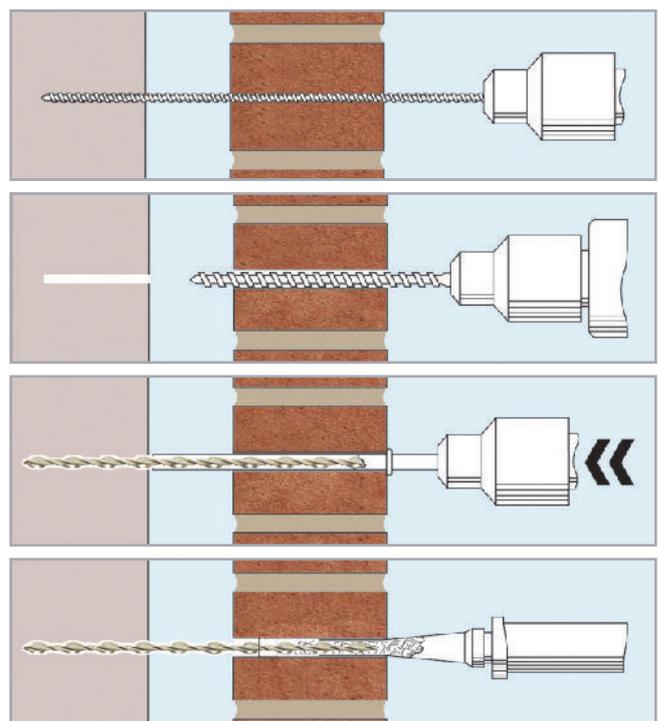
DRILLING GUIDE

Far Leaf Material	Far Leaf Pilot (mm)	Penetration into Far Leaf (mm)
Timber Stud	None	55
Clay Brick	5-6	70
Concrete Block	5-6	70
Concrete	6-6.5	35

NOTE. Appropriately sized pilot holes for the far leaf are essential for a successful tie. Too large, and the tie will 'push in', and too small, the tie will 'wedge', not cut into the substrate. All figures quoted are indicative dependent on the exact nature of the substrate. Testing should always be undertaken on site using the Helifix Load Test unit.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.



RECOMMENDED TOOLING

- For drillingRotary percussion drill 650/850w
- For cleaning the clearance holeAir jet and brush
- For injection of epoxy resinApplicator gun with nozzle
- For installation of RetroTieSDS rotary hammer drill 650/850w and Support Tool

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. RetroTies to be spaced in accordance with building code requirements to suit site conditions and location, and in accordance with the specific engineering design of the responsible engineer.
- B. Diameter of pilot hole to be determined on site — typically 5mm. The appropriate diameter will depend on the diameter of the RetroTie and the density of the far leaf material. Attainable pull out loads can be tested using a Helifix Load Test Unit.
- B. Depth of pilot hole to be RetroTie length + 10mm.
- C. RetroTie length to equal:
Minimum 3/4 of near leaf thickness + cavity width + far leaf penetration depending on material, typically 70mm
Refer to the Drilling Guide for further guidance.
- D. Ties may be installed from either side of the wall.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

ANZ
RT03

Wall tie retrofit using ResiTies

Product	Description	Code
ResiTie	Stainless steel helical remedial wall tie	HDF
EpoxyPlus	Thixotropic pure epoxy resin	HRT

Method Statement

1. Mark the points for ResiTie insertion on the face of the wall.*
2. Drill a 10–12mm diameter clearance hole through the near masonry leaf and into the back-up substrate to the specified depth.*
3. Clean the hole of spoil using a brush and airjet.
4. Push the nozzle of the epoxy resin applicator through the near leaf and into the clearance hole in the back-up substrate.
5. Pump the applicator to inject resin into the hole in the back-up substrate. Inject resin until the hole is filled completely.
6. Push the ResiTie through the clearance hole in the near masonry leaf and wind the tie into the resin-filled hole in the back-up substrate.
7. Place the end of the nozzle of the resin applicator over the exposed end of the ResiTie in the near leaf. Masking tape may be placed around the hole to protect the surface of the wall from resin spillage. Cloth may also be wrapped around the nozzle to help seal the opening during injection and protect the wall face from resin spillage.
8. Inject resin until the hole is filled.
9. Allow the resin to cure and make good.

RECOMMENDED TOOLING

For drillingRotary percussion drill 650/850w

For cleaning the clearance holeAir jet and brush

For injection of EpoxyPlus resinApplicator gun with nozzle

*SPECIFICATION NOTES

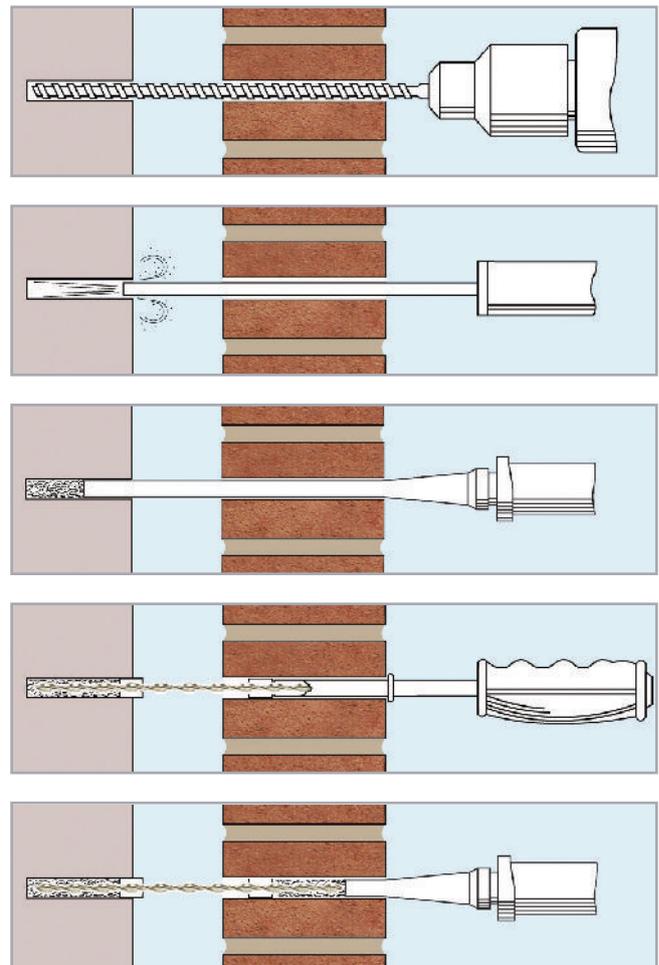
The following criteria are to be used unless specified otherwise:

- A. ResiTie are to be spaced in accordance with building code requirements to suit site conditions and location, and in accordance with the specific engineering design of the responsible engineer.
- B. Depth of clearance hole to be ResiTie length + 10mm.
- C. ResiTie length to equal:
Minimum 3/4 of near leaf thickness + cavity width + minimum 55mm for leaf penetration
- D. Ties may be installed from either side of the wall.
- E. Ties may be installed into the bed joints or directly into the masonry to suit site conditions, engineering and architectural requirements.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.



NOTE. Avoid leaning or pushing heavily on the drill during operation to ensure the accuracy of the hole's diameter and to limit spalling of the near leaf as the drill breaks into the cavity.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.

ANZ
RT04

Wall tie retrofit using Asymmetric DryFix

Product	Description	Code
Asymmetric DryFix	Stainless steel dry pinning system	HDF

Method Statement

1. Mark the points for DryFix installation on the face of the wall.*
2. Drill a 5mm diameter pilot hole (subject to confirmation on site) through the near leaf and into the back-up substrate, to the predetermined depth, using a rotary percussion 3-jaw-chuck drill.*
3. Fit the Power Driver Attachment to a light-weight SDS hammer drill set to a slow speed and hammer only.
4. Load the wider section of the DryFix tie into the Power Driver Attachment.
5. Support the Power Driver Attachment with one hand, while using the other to work the drill, and drive the DryFix tie into position until its outer end is recessed below the face of the near leaf by the insertion tool.
6. Make good the entry hole with matching materials.

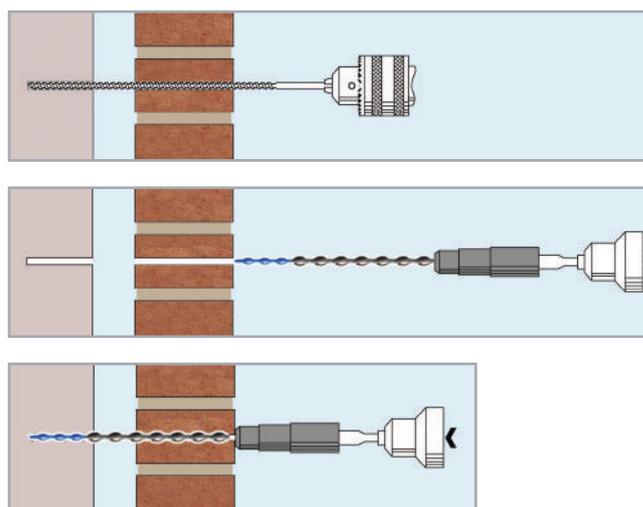
NOTE. Avoid leaning or pushing heavily on the drill during operation to ensure the accuracy of the hole's diameter and to limit spalling of the near leaf as the drill breaks into the cavity.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear. Refer to the *Helifix Wall and Pinning Tie Safe Installation Guide* for further instruction.

DRILLING GUIDE

Far Leaf Material	Far Leaf Pilot (mm)	Penetration into Far Leaf (mm)
Clay Brick	5-6	70
Concrete Block	5-6	70
Concrete	6-6.5	35

NOTE. Some substrates, such as hard concrete and granite, are not suitable for Asymmetric Tie installation, due to the inability of the tie to cut into the material. Appropriately sized pilot holes for near and far leaves are essential for a successful tie. Too large, and the tie will 'push in', and too small, the tie will 'wedge', not cut into the substrate. All figures quoted are indicative dependent on the exact nature of the substrate. Testing should always be undertaken on site using the Helifix Load Test unit.



RECOMMENDED TOOLING

For drillingRotary percussion drill 650/850w
 For installation of DryFixSDS rotary hammer drill 650/850w and DryFix Power Driver Attachment

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. DryFix are to be spaced in accordance with building code requirements to suit site conditions and location, and in accordance with the specific engineering design of the responsible engineer.
- B. Diameter of pilot hole to be determined on site—typically 5mm. The appropriate diameter for the far leaf will depend on the diameter of the reduced section of the Asymmetric DryFix tie and the density of the far leaf material. The diameter of the hole in the near leaf may be increased to suit the larger diameter section of the tie depending on the density of the near leaf material. Attainable pull out loads can be tested using a Helifix Load Test Unit.
- C. Depth of pilot hole to be DryFix tie length + 10mm.
- D. DryFix length to equal:
 $Near\ leaf\ thickness\ less\ 10mm + cavity\ width + far\ leaf\ penetration$
depending on material, typically 70mm
 Refer to the Helifix Drilling Guide for further instruction.
- E. Wherever possible, ties should be installed directly into the masonry, but they may also be driven into the mortar provided that this is strong and in good condition.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.



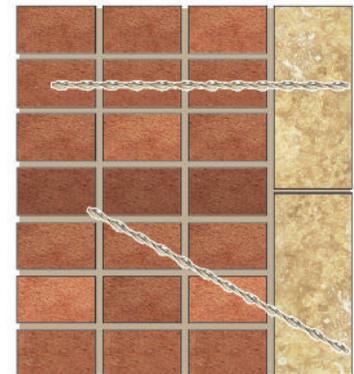
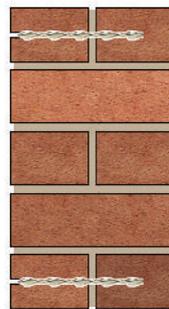
**ANZ
RT05**

Solid wall pinning using DryFix

Product	Description	Code
DryFix	Stainless steel dry pinning system	HDF

Method Statement

1. Mark the points for DryFix insertion on the face of the wall.*
2. Drill a 5mm diameter pilot hole (subject to confirmation on site) into the masonry to the specified depth using a rotary percussion 3-jaw-chuck drill.*
4. Fit the Power Driver Attachment to a light-weight SDS hammer drill set to a slow speed and hammer only.
5. Load the DryFix tie into the Power Driver Attachment.
6. Support the power driver attachment with one hand, while using the other to work the drill, and drive the DryFix tie into position until its outer end is recessed below the face of the near leaf by the insertion tool.
7. Make good the entry hole with matching materials.



RECOMMENDED TOOLING

For drillingRotary percussion drill 650/850w
 For installation of DryFixSDS rotary hammer drill 650/850w and DryFix Power Driver Attachment

*SPECIFICATION NOTES

- The following criteria are to be used unless specified otherwise:
- A. DryFix are to be spaced in accordance with building code requirements to suit site conditions and location, **and in accordance with the specific engineering design of the responsible engineer.**
 - B. Diameter of pilot hole to be determined on site —typically 5mm. The appropriate diameter will depend on the diameter of the DryFix tie and the density of the materials. Obtainable pull out loads can be tested using a Helifix Load Test Unit.
 - C. Depth of pilot hole to be DryFix tie length + 10mm.
 - D. DryFix length to be sufficient to penetrate 35-70mm into the remote leaf depending on its hardness, with harder materials requiring less penetration. Typically, 70mm penetration is to be achieved when installing into common, dry-pressed or extruded brickwork.
 - E. Ties may be installed from either side of the wall.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

NOTE. Avoid leaning or pushing heavily on the drill during operation to ensure the accuracy of the hole's diameter and to limit spalling of the near leaf as the drill breaks into the cavity.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear. Refer to the *Helifix Wall and Pinning Tie Safe Installation Guide* for further instruction.

ANZ
RT08

Veneer wall tie retrofit using DryFix

Product	Description	Code
DryFix	Stainless steel dry pinning system	HDF

Method Statement

1. Mark the points for DryFix insertion on the face of the wall.*
2. Drill a 5mm diameter pilot hole (subject to confirmation on site) through the timber using a rotary percussion 3-jaw-chuck drill with appropriate bit.*
3. Drill a 5mm diameter pilot hole (subject to confirmation on site) into the masonry to the specified depth using a rotary percussion 3-jaw chuck drill with appropriate masonry bit.*
4. Fit the Power Driver Attachment to a light-weight SDS hammer drill set to a slow speed and hammer only.
5. Load the DryFix tie into the Power Driver Attachment.
6. Support the power driver attachment with one hand, while using the other to work the drill, and drive the DryFix tie into the pre-drilled pilot hole to finish flush or just beyond the surface of the timber.

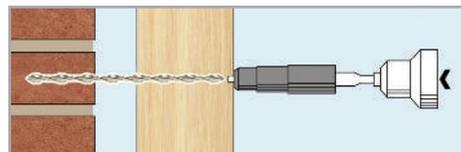
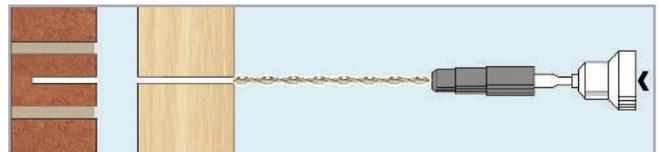
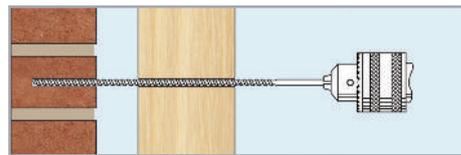
NOTE. Avoid leaning or pushing heavily on the drill during operation to ensure the accuracy of the hole's diameter and to limit spalling of the near leaf as the drill breaks into the cavity.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear. Refer to the *Helifix Wall and Pinning Tie Safe Installation Guide* for further instruction.

DRILLING GUIDE

Far Leaf Material	Far Leaf Pilot (mm)	Penetration into Far Leaf (mm)
Clay Brick	5-6	70
Concrete Block	5-6	70
Concrete	6-6.5	35

NOTE. Some substrates, such as hard concrete and granite, are not suitable for Asymmetric Tie installation, due to the inability of the tie to cut into the material. Appropriately sized pilot holes for near and far leaves are essential for a successful tie. Too large, and the tie will 'push in', and too small, the tie will 'wedge', not cut into the substrate. All figures quoted are indicative dependent on the exact nature of the substrate. Testing should always be undertaken on site using the Helifix Load Test unit.



RECOMMENDED TOOLING

For drillingRotary percussion drill 650/850w

For installation of DryFixSDS rotary hammer drill 650/850w and DryFix Power Driver Attachment

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. DryFix are to be spaced in accordance with building code requirements to suit site conditions and location, **and in accordance with the specific engineering design of the responsible engineer.**
- B. Diameter of pilot hole to be determined on site —typically 5mm. The appropriate diameter will depend on the diameter of the DryFix tie and the density of the near and far leaf materials. Attainable pull out loads can be tested using a Helifix Load Test Unit.
- C. Depth of pilot hole to be DryFix tie length + 10mm.
- D. DryFix length to equal:
Near leaf thickness less 10mm + cavity width + far leaf penetration depending on material, typically 70mm
Refer to the Drilling Guide for further guidance.
- E. Ties may be installed from either side of the wall.
- F. Wherever possible, ties should be installed directly into the masonry, but they may also be driven into the mortar provided that this is strong and in good condition.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

- Product details available from Helifix.
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**ANZ
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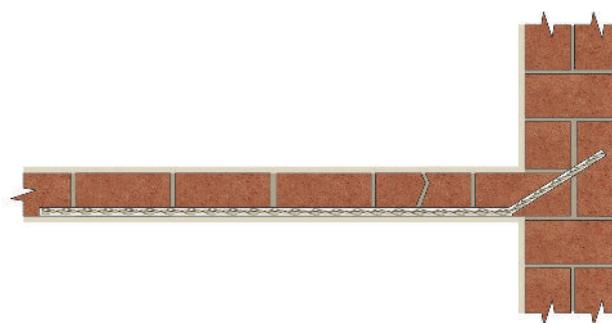
Tying an internal wall to an external solid wall using HeliBars

Product	Description	Code
HeliBar	Helical stainless steel reinforcement	HBR
HeliBond	Injectable cementitious grout	HLB

Method Statement

- Using an appropriate power cutting tool with vacuum attachment, cut slots into the horizontal mortar joints, to the specified depth and at the required vertical spacing.* Use a power/hand chisel or mortar saw to continue slots up to the internal corner. Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond. If the wall is rendered and the mortar joints are not visible, cut the horizontal slots through the render and into the masonry.
- Where the slot ends at an internal corner drill a 12mm diameter hole at an angle 150mm into the adjoining wall. If required, drill a 12mm diameter hole through to the external face of the adjoining wall and prepare an additional slot in the external face as per step 1.
- Clean out all dust and loose mortar from the slots and holes and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use a primer. Ensure that the slots are damp or primed prior to commencing steps 6 and 7.
- Cut the 6mm HeliBar to the required length. If the HeliBar is not required to extend through to the external face of the adjoining wall, bend the end of the HeliBar to fit to the full depth of the hole, then remove. If the HeliBar is required to extend through to the external face, bend the bar so that a sufficient length of HeliBar extends through the hole for grouting into the external face, then remove.
- Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.
- Inject a bead of HeliBond grout, 10-15mm deep, into the back of the slot using the mortar nozzle.
- Push the HeliBar into or through the grout-filled hole and the remaining portion of bar into the grout-filled slot to obtain good coverage. Bend the bar as necessary to install any remaining HeliBar portion into the external face of the adjoining wall.
- Inject a second bead of HeliBond grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond as necessary into the slot, leaving 10-15mm for new pointing.
- Inject HeliBond grout or epoxy resin into the hole to fill.
- Point up the remaining slot with a suitable matching mortar and make good the crack using an appropriate Helifix bonding agent or filler.
- Clean tools with clean, fresh water.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.



RECOMMENDED TOOLING

- For cutting slotsChisel, mortar saw (e.g. Arbortech All Saw) or angle grinder with dust guard (e.g. C-Tec) and vacuum
- For mixing HeliBondDrill with mixing paddle
- For injection of HeliBond into slotsHelifix Pointing Gun with mortar nozzle
- For smoothing pointingStandard finger trowel

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- Depth of slot into the masonry to be 25 to 35mm + thickness of any plaster.
- Height of slot to be equal to full mortar joint height, with a minimum of 8mm.
- HeliBar to be long enough to extend a minimum of 500mm past the crack and a minimum of 150mm into the external wall.
- Normal vertical spacing is 340mm (4 brick courses).
- In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the slot, or priming, should be carried out just prior to injecting the HeliBond grout.
- Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.
- Pointing may be carried out as soon as is convenient after the HeliBond has started to gel. Ensure that pointing does not disturb the masonry/HeliBond connection.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

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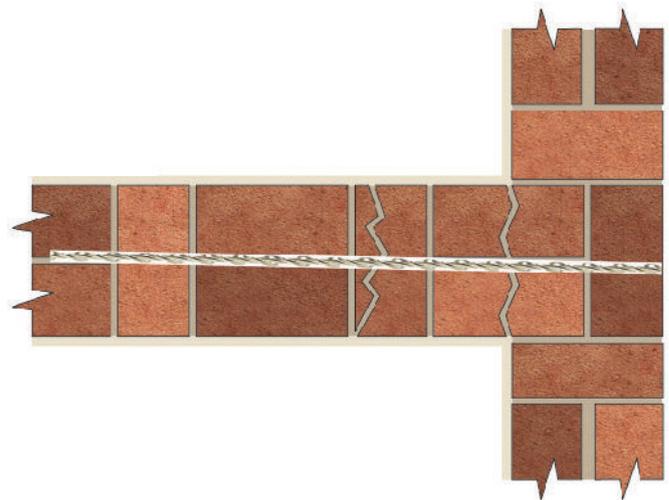
Tying a party internal wall to an external solid wall using CemTies

Product	Description	Code
CemTie	Helical HeliBar stainless steel pin	HBR
HeliBond	Injectable cementitious grout	HLB

Method Statement

1. Mark the points for CemTie installation on the face of the wall.*
2. Drill a 16-18mm diameter clearance hole through the outer wall and to the required depth.*
3. Clean out all dust from the hole and thoroughly flush with water. Where the substrate is very porous or flushing with water is inappropriate, use a primer. Ensure the hole is damp or primed prior to commencing step 8.
4. Attach the required length of CemTie pinning nozzle to the Helifix Pointing Gun so that the flared end of the pinning nozzle sits inside the cone.
5. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the gun.
6. Pump grout to fill the nozzle.
7. Wind the CemTie into the nozzle and ensure that it is fully covered in grout.
8. Insert the nozzle to the full depth of the drilled hole and pump the grout. Slowly withdraw the nozzle while pumping. The CemTie will be carried out with the HeliBond grout as it is forced through the nozzle. Back pressure will help to push the nozzle back out of the hole.
9. Make good all holes at the surface using either a mixture of sand, cement and oxide colouring to match the original surrounding brick/stone surfaces or a silicone sealant coated with brick dust or drillings. Make good the crack using an appropriate Helifix bonding agent or filler depending on the width of the crack.
10. Clean tools with clean, fresh water.

CAUTION. Always locate, identify and isolate any electrical, water or gas services which may be present in the wall or the wall cavities and can pose a safety risk before drilling or cutting. Always take the necessary safety precautions. Use electrical safety gloves and wear appropriate footwear and eyewear.



RECOMMENDED TOOLING

For drillingSDS rotary hammer drill 650/850w
 For mixing HeliBondDrill with mixing paddle
 For injection of HeliBond into slotsHelifix Pointing Gun HD with CemTie pinning nozzle

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. CemTies are to be installed at a vertical spacing of 425mm.
- B. CemTies are to extend a minimum 300mm past the crack.
- C. Depth of hole to be CemTie length + 25mm.
- D. CemTies are to be installed within the centre third of the wall.
- E. Ensure the CemTies are installed into solid brick/stone and not the mortar joints or loose rubble within the wall.
- F. In hot conditions ensure the masonry is well wetted or primed to prevent premature drying of the HeliBond due to rapid de-watering. Ideally additional wetting of the hole should be carried out just prior to inserting the CemTie.
- G. Do not use HeliBond when the air temperature is +4°C and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

The above specification notes are for general guidance only and Helifix reserves the right to amend details/notes as necessary.

GENERAL NOTES

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- Contact Helifix if your application differs from this repair detail or you require specific technical information.

ANZ
ST02

Tying a new masonry veneer to a timber frame using StarTies

Product	Description	Code
StarTie	Stainless steel new build wall tie	HDF

Method Statement

1. Load the StarTie into the support tool fitted to a light-weight SDS hammer drill.
2. Drive the StarTie into the timber member to the specified depth.*
3. Bed the exposed tail of the StarTie into the new mortar bed.

RECOMMENDED TOOLING

For drillingRotary percussion drill 650/850w

For installation of StarTieSDS rotary hammer drill 650/850w and support tool

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- A. StarTie are to be spaced in accordance with building code requirements to suit site conditions and location, **and in accordance with the specific engineering design of the responsible engineer.**
- B. A pilot hole, typically 3mm-5mm diameter; may be required to allow sufficient StarTie penetration when working with hard timbers.
- C. Depth of pilot hole to equal tie penetration.
- D. StarTie length to equal:
 - Timber penetration + cavity width + new leaf embedment*

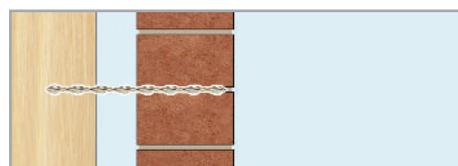
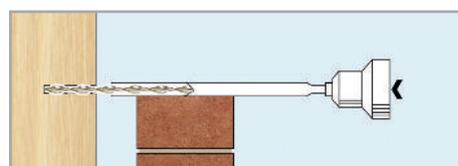
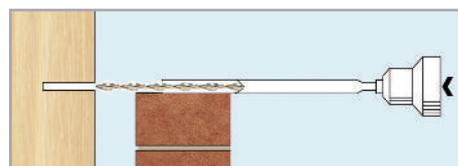
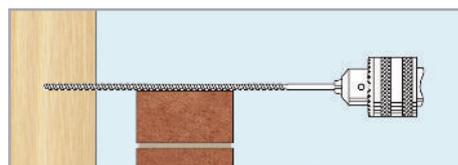
Typically, ties should be sufficiently long to penetrate 50mm-70mm into the timber member. Ties should be sufficiently long to extend not less than half way into the new leaf.

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GENERAL NOTES

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