Helifix repair and reinforcement products, with their concealed non-disruptive installation techniques, help to preserve our built environment. They secure and strengthen all masonry structures, from houses and offices to factories and heritage sites. Our innovative systems not only restore structural integrity in weakened masonry by overcoming virtually all commonly occurring faults, they can also be used to improve the existing performance of our buildings, offering increased protection against seismic activity and other movement threats.

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

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

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

Our ties 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 stabilization in existing structures and secure, lasting connections in new build applications. Our products and techniques are highly regarded, well recognized and well proven through a long history of worldwide use.

HELIFIX TIES 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, wood 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 either direct from Helifix in San Antonio, TX or from a local distributor in your area. 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.

Helifix (USA), a division of Halfen USA, established 2009

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.
Hefix, Broderick Building, Detroit

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

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

DryFix, HeliBar, Christchurch, NZ

Crack stitching, Kalgoorlie, WA Australia

Sydney Opera House, Australia
Marine grade DryFix ties were selected, due to their fixing security and loading resistance, as the most effective means of securing new concrete caps to main pillars supporting the forecourt at the iconic Sydney Opera House.
Since its inception, Helifix has been recognized as a leader in the design and engineering of innovative construction ties 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 stabilization 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.

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

1988
Helifix attends its first Interbuild exhibition in Birmingham.

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

1989
InSkew warm roof batten anchor developed in collaboration with Celotex for a roof in Cardiff and is used on the AA building in Basingstoke.

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

1991
Factory is set up in Tyne & Wear, UK.

1992
Helifix Australia begins trading. The Helibeam 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.

1993

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

1995
After exhibiting at a show in Prague, Helifix appoints an agent in Czech Republic.

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

1997

1998

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

2000

For more information, telephone our technical support team on TOLL FREE: 888-992-9989, or visit WWW.HELIFIX.COM

INNOVATION
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 anchors 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 anchor, 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 program of research and development has, over the years, produced a variety of innovative ties and repair systems. These include: RetroTie, the first stainless steel remedial helical wall tie; InSkew, a high performance, self-tapping warm roof batten anchor; TurboFast, a multi-purpose wood to masonry flush anchor; 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.

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All Helifix products have undergone extensive independent testing at universities in the USA, UK, Australia, New Zealand and around the world, and at well recognised bodies such as the BRE, TRADA and the TRL (UK). Full details of the complete test program 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.

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.

2013
Helifix USA relocated to Texas merging operations with Halfen USA.

2014
Helifix UK offices relocated to The Mille, a landmark London office building.
Range of Applications

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 the world. 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 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.

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.
Helifix construction ties, repair and reinforcing systems provide secure, lasting connections in all forms of brick, block, concrete, stone and wood 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, tunnels and domestic housing.

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 wood or MDF to bricks, blocks and concrete in numerous situations. Contact us for more information.

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

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 facades to structural elements, and to complement other retrofit solutions.

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

AIA Accredited Presentations

Helifix is approved by the American Institute of Architects as a CES provider of approved courses that cover a variety of building topics and issues.

The Helifix course is titled “Sustainable Structural Solutions – Masonry Remediation”. This course will educate attendees on the common causes of masonry failure and the innovative ways in which Helifix systems correct the problems using minimally evasive products to stabilize and reinforce structures without the extreme cost and time involved in tear down and rebuild.

If you would like to arrange a Helifix AIA accredited presentation, please contact us.
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 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 story 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 and blown stucco. By using appropriate combinations of Helifix ties and reinforcing rods virtually any situation can be resolved. Do not hesitate to call us to discuss your particular problem.
Remedial wall ties are installed to tie masonry wythes together or veneers to internal structural frames. Depending on construction type and site conditions, DryFix ties may be driven directly into each wythe, via a small pilot hole, to provide a completely dry connection.

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.

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.

DryFix ties are installed directly into the wall at regular intervals. DryFix ties are driven directly into the wall, via small pilot holes. CemTies are installed into clearance holes with HeliBond grout.

Lengths of HeliBar extending 500mm (20”) either side of the crack are bonded into slots normally cut into the mortar beds using HeliBond grout. Where cracks are less than 500mm (20”) from an external corner or an opening, at least 100mm (4”) of HeliBar should be bent round the corner and bonded into the return wall.

Predetermined slots on the internal wall are channelled out to the specified length into the corner. Angled holes of 10mm (½”) are drilled from the corner into the external wall. Single lengths of HeliBar are bent to shape with the angled end and internal wall grouted into place with HeliBond cementitious grout.
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 stabilized.

Full details of all applications and repairs are available at:

www.helifix.com
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 wythes, via a small pilot hole, using a special attachment which leaves the tie recessed below the face.

*Products required:* DryFix – page 20 TorkFix – page 24

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 – page 18 HeliBond – page 27
### 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 and BowTies HDs when mechanically connecting to two or three parallel joists. The BowTie is inserted through a clearance hole in the wall and power-driven into position before being bonded into the masonry.

**Products required:** BowTie – page 23

### 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 – page 18 TorkFix – page 24 CemTie – page 26

### 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 stabilize the existing masonry while redistributing the structural loads. Their composite action provides great strength combined with structural flexibility, while other ties 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 – page 17

### 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 – page 17 DryFix – page 20 TorkFix – page 24 CemTie – page 26
Adding strength and ductility

Improving the ability of buildings and building elements to deform without collapsing is an important part of seismic strengthening programs. 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** – page 18

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 wythes and at an angle through the wall to secure it to the roof or bridge deck.

Products required: **Helifix System** – page 17  **TorkFix** – page 24  **CemTie** – page 26

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 wood and can be used to tie a variety of different materials together. DryFix ties, for instance, can be used to tie wood to masonry or masonry to new structural concrete.

Products required: **DryFix** – page 20  **TorkFix** – page 24

Creating movement joints

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

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

Products required: **HeliBar** – page 18  **DryFix** – page 20
Products

Helifix ties 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 wood 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/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 stabilize the existing masonry while redistributing the structural loads. Their composite action provides great strength combined with structural flexibility, while other ties 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**

<table>
<thead>
<tr>
<th>Material</th>
<th>Austenitic stainless steel Grade 316 Helibar as standard (Grade 304 available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>6.0mm (1/4”) 4.5 (3/16”), 8.0 (5/16”) and 10.0mm (3/8”) available</td>
</tr>
<tr>
<td>Stock Length</td>
<td>Up to 7m (24'</td>
</tr>
<tr>
<td>Required Length</td>
<td>To suit. Helibars may be overlapped to suit spans in excess of 7m (24’).</td>
</tr>
<tr>
<td>Bonding agent</td>
<td>HeliBond Cementitious Grout</td>
</tr>
</tbody>
</table>
HeliBar

HeliBar is a helical stainless steel reinforcing bar used for strengthening and stabilizing 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 stabilization and creation
- Horizontal structural restraint
- Reinforcing new build masonry
- Providing seismic upgrades

CHARACTERISTIC MATERIAL PROPERTIES

<table>
<thead>
<tr>
<th>HeliBar Diameter</th>
<th>4.5mm (3/16&quot;)</th>
<th>6.0mm (1/4&quot;)</th>
<th>8.0mm (5/16&quot;)</th>
<th>10.0mm (3/8&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code</td>
<td>HBR45</td>
<td>HBR60</td>
<td>HBR80</td>
<td>HBR10</td>
</tr>
<tr>
<td>Cross Sectional Area (mm²)</td>
<td>5.6</td>
<td>8.1</td>
<td>10.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Stock Length (m)</td>
<td>7.0 (24')</td>
<td>7.0 (24')</td>
<td>7.0 (24')</td>
<td>7.0 (24')</td>
</tr>
<tr>
<td>Pitch (mm)</td>
<td>25</td>
<td>29</td>
<td>39</td>
<td>45</td>
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<tr>
<td>Ultimate Tensile Strength (MPa)</td>
<td>1400</td>
<td>1112</td>
<td>1100</td>
<td>1088</td>
</tr>
<tr>
<td>Tensile Strength (kN)</td>
<td>8.0</td>
<td>9.5</td>
<td>11.4</td>
<td>16.7</td>
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<tr>
<td>0.2% Proof Stress (MPa)</td>
<td>1150</td>
<td>840</td>
<td>860</td>
<td>770</td>
</tr>
<tr>
<td>Shear Strength — Averaged (MPa)</td>
<td>900</td>
<td>650</td>
<td>700</td>
<td>750</td>
</tr>
<tr>
<td>Grade of Stainless Steel</td>
<td>ASTM304</td>
<td>ASTM316</td>
<td>ASTM316</td>
<td>ASTM316</td>
</tr>
</tbody>
</table>
Crack Stitching

Crack Stitching is a method of repairing and stabilizing 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

**SPECIFICATION NOTES**

A. HeliBar diameter 6mm (1/4") as standard.
B. Depth of slot and slot spacing as below.
C. Height of slot to equal mortar joint height, with a minimum of 8mm (5/16”).
D. HeliBar to be long enough to extend a minimum of 500mm (20") either side of the crack or 500mm (20") beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.
E. For solid masonry in excess of 230mm (9") and in a cavity wall where both wythes are cracked, the wall must be crack stitched on both sides.
F. Where a crack is less than 500mm (20") from the end of a wall or an opening, the HeliBar is to be continued for at least 200mm (8") 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**

<table>
<thead>
<tr>
<th></th>
<th>Single Wythe</th>
<th>Solid / Multi-Wythe Masonry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 110mm (4 1/2&quot;)</td>
<td>110 to 230mm (4 1/2&quot; - 9&quot;)</td>
</tr>
<tr>
<td>Slot Depth</td>
<td>35mm (1 1/8&quot;)</td>
<td>40mm (1 1/2&quot;)</td>
</tr>
<tr>
<td>Vertical Spacing</td>
<td>Every 4 brick courses (340mm (13&quot;) approx.)</td>
<td></td>
</tr>
</tbody>
</table>
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 stucco 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
- Facade and backup substrate security easily proof tested on site.
- 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 (3/16") 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

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>8mm standard (10mm and Asymmetric DryFix available)</td>
</tr>
<tr>
<td>Stock Lengths</td>
<td>50 – 600mm (2” – 24&quot;)</td>
</tr>
<tr>
<td>Required Length</td>
<td>Facade thickness less 1/2&quot; + cavity width + back up penetration, typically 3&quot; (Refer to Installation Detail for further instruction)</td>
</tr>
<tr>
<td>Depth of pilot hole</td>
<td>Length of DryFix + 1/8&quot;</td>
</tr>
<tr>
<td>Bonding agent</td>
<td>None required</td>
</tr>
</tbody>
</table>
DryFix stucco & thin panel pin
Short DryFix versions including 70 and 90mm (3” and 4”) are available for re-pinning separated, unstable and potentially dangerous loose stucco and thin panels.

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 facade materials to a hard back up material, such as concrete or hard brick.

CHARACTERISTIC MATERIAL PROPERTIES

<table>
<thead>
<tr>
<th>Grade of Stainless Steel</th>
<th>Diameter (mm)</th>
<th>Length (mm)</th>
<th>Cross Sectional Area (mm²)</th>
<th>Ultimate Tensile Strength (MPa)</th>
<th>UTS (kN)</th>
<th>0.2% Proof Stress (MPa)</th>
<th>Shear Strength (Averaged) (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTM 304</td>
<td>8.0 (5/16”)</td>
<td>50 – 400</td>
<td>9.3</td>
<td>1398</td>
<td>13</td>
<td>1100</td>
<td>753</td>
</tr>
<tr>
<td>ASTM 304</td>
<td>10.0 (3/8”)</td>
<td>155 – 500</td>
<td>14.5</td>
<td>1034</td>
<td>15</td>
<td>800</td>
<td>759</td>
</tr>
<tr>
<td>ASTM 304</td>
<td>8.0 / 10.0 (5/16” / 3/8”)</td>
<td>155 – 325 (6” – 13”)</td>
<td>15.4</td>
<td>1064</td>
<td>15</td>
<td>850</td>
<td>850</td>
</tr>
</tbody>
</table>

NOTE Other lengths available on request.

CHARACTERISTIC PERFORMANCE DATA

AS/NZS2699.1 Type B Remedial Classification (8.0mm / 5/16”) Tie

<table>
<thead>
<tr>
<th>Test Type (Connection type)</th>
<th>Cavity Width (mm)</th>
<th>Axial Stiffness (kN/mm)</th>
<th>Axial Strength (kN)</th>
<th>Residual Strength (kN)</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type B Remedial Tie (Drive-in connection to brick at both ends of the tie)</td>
<td>75 (3”)</td>
<td>0.61</td>
<td>1.902</td>
<td>2.321</td>
<td>Earthquake Heavy Duty, for cavity 75mm (3”)</td>
</tr>
</tbody>
</table>

NOTE Standard AS/NZS2699.1 Type B classification does not strictly apply. AS/NZS2699.1 Type B pertains to veneer tie classification only. Remedial cavity wall tie tests performed in accordance with AS/NZS2699.1 Type B in the absence of any other suitable remedial seismic standard.
PERFORMANCE CHARACTERISTICS

<table>
<thead>
<tr>
<th>Material</th>
<th>Effective Minimum Embed (inches)</th>
<th>Ultimate Tension/Compression (lbs) 8mm</th>
<th>Ultimate Tension/Compression (lbs) 10mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortar Joint (1500 psi)</td>
<td>3”</td>
<td>616</td>
<td>780</td>
</tr>
<tr>
<td>Solid Brick (9000 psi)</td>
<td>3½”</td>
<td>700</td>
<td>750</td>
</tr>
<tr>
<td>Cavity Brick</td>
<td>3½”</td>
<td>1280</td>
<td>1390</td>
</tr>
<tr>
<td>Normal Weight C.M.U.</td>
<td>1”</td>
<td>801</td>
<td>907</td>
</tr>
<tr>
<td>Light Weight C.M.U.</td>
<td>2”</td>
<td>550</td>
<td>550</td>
</tr>
<tr>
<td>Concrete (3500 psi)</td>
<td>1⅛”</td>
<td>1200</td>
<td>1300</td>
</tr>
<tr>
<td>Wood Kiln Dried Stud 2 x 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3”</td>
<td>517</td>
<td>N/R</td>
</tr>
<tr>
<td></td>
<td>3”</td>
<td>520</td>
<td>N/R</td>
</tr>
<tr>
<td>Metal Stud 16 Gauge</td>
<td>1⅛”</td>
<td>620</td>
<td>650</td>
</tr>
<tr>
<td>Granite</td>
<td>⅞”</td>
<td>590</td>
<td>800</td>
</tr>
<tr>
<td>Travertine</td>
<td>⅞”</td>
<td>600</td>
<td>620</td>
</tr>
<tr>
<td>Limestone</td>
<td>⅞”</td>
<td>520</td>
<td>N/R</td>
</tr>
<tr>
<td>3½&quot; Steel</td>
<td>⅞”</td>
<td>616</td>
<td>780</td>
</tr>
</tbody>
</table>

* Note: Each construction project is unique and the appropriate use of this product is the responsibility of the engineers, architects, and other professionals who are familiar with the specific requirements of the project. This data reflects field results and is provided as a guideline for the designer. Site testing is encouraged for the verification of load carrying capacity. (N/R = not recommended)

ULTIMATE BUCKLING STRENGTH

<table>
<thead>
<tr>
<th>Unsupported Length (mm)</th>
<th>8mm</th>
<th>10mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1” (25mm)</td>
<td>1327</td>
<td>2039</td>
</tr>
<tr>
<td>2” (50mm)</td>
<td>652</td>
<td>1540</td>
</tr>
<tr>
<td>4” (100mm)</td>
<td>407</td>
<td>580</td>
</tr>
<tr>
<td>6” (150mm)</td>
<td>295</td>
<td>473</td>
</tr>
</tbody>
</table>

DRYFIX LENGTH SELECTION – Standard Lengths 3” to 36”

<table>
<thead>
<tr>
<th>Tie Description 8mm or 10mm</th>
<th>Nominal Length (inches)</th>
<th>Minimum Drilled Hole Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>115mm</td>
<td>4.5”</td>
<td>5.50”</td>
</tr>
<tr>
<td>155mm</td>
<td>6.1”</td>
<td>6.75”</td>
</tr>
<tr>
<td>170mm</td>
<td>6.7”</td>
<td>7.50”</td>
</tr>
<tr>
<td>195mm</td>
<td>7.8”</td>
<td>8.25”</td>
</tr>
<tr>
<td>220mm</td>
<td>8.7”</td>
<td>9.25”</td>
</tr>
<tr>
<td>245mm</td>
<td>9.7”</td>
<td>10.25”</td>
</tr>
<tr>
<td>270mm</td>
<td>10.7”</td>
<td>11.25”</td>
</tr>
<tr>
<td>295mm</td>
<td>11.7”</td>
<td>12.25”</td>
</tr>
<tr>
<td>325mm</td>
<td>12.8”</td>
<td>13.25”</td>
</tr>
</tbody>
</table>
BowTie

BowTie is a wall tie system for connecting masonry walls to internal wood joists. Standard helical BowTies are recommended when installing into joist ends. BowTie HDs are used when tying to parallel 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 (3”). Depending on the circumstances, the tie may be either dry fixed into the wall or bonded into it with HeliBond cementitious grout.

The BowTie HD design includes a 12mm (1/2”) diameter threaded bar with a self-cutting end for easy installation. Installation involves drilling a clearance hole through the masonry, driving the BowTie HD through the first and subsequent joists using a setting tool fitted to a drill set on rotary only and bonding the end of the tie to the wall with HeliBond cementitious grout.

PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Material</th>
<th>Standard: Austenitic stainless steel Grade 304 as standard (Grade 316 available)</th>
<th>BowTie HD: Austenitic stainless steel Grade 304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>Standard: 8.0mm (5/16”) standard (10.0mm – 3/8” available)</td>
<td>BowTie HD: 12.0mm (1/2”)</td>
</tr>
<tr>
<td>Stock Length</td>
<td>Standard: Cut lengths up to 500mm (20”)</td>
<td>BowTie HD: 1000mm and 1500mm (40” and 60”)</td>
</tr>
<tr>
<td>Required Length</td>
<td>Standard: Sufficient to penetrate minimum 75mm (3”) into joist end grain</td>
<td>BowTie HD: Sufficient to penetrate 75mm (3”) into or through specified joist</td>
</tr>
<tr>
<td>Bonding agent</td>
<td>HeliBond cementitious grout</td>
<td></td>
</tr>
</tbody>
</table>
TorkFix

TorkFix retrofit mechanical repair anchors are a well proven method of stabilizing masonry veneer walls which have become detached from the inner supporting structure due to wall tie failure or omission at the time of construction. Suitable for tying masonry veneers to inner wythes of brick, concrete block, wood or steel stud, TorkFix retrofit anchors provide structural stability and resist wind pressure forces.

TorkFix anchors are manufactured with a central tie rod made from austenitic stainless steel which gives adequate strength and flexibility. A rubber drip ring prevents water transfer between wythes. The brass expander is made from ASTM G71 brass.

APPLICATIONS

• For securing masonry veneers to brick, concrete block, CMU backup material, steel stud and masonry backup materials

• To provide structural stability and resist wind pressure forces where wall ties have failed or been omitted

Brick to Brick / Concrete Block / CMU

PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Material</th>
<th>Austenitic stainless steel Grade 304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>1/16”</td>
</tr>
<tr>
<td>Length</td>
<td>Facade thickness + cavity width + backup penetration of 2 1/2”</td>
</tr>
<tr>
<td>Diameter of clearance hole, facade and backup</td>
<td>7/16”</td>
</tr>
<tr>
<td>Depth of clearance hole</td>
<td>Length of TorkFix + 2 1/2”</td>
</tr>
<tr>
<td>Fixing density</td>
<td>To engineer’s specification</td>
</tr>
<tr>
<td>Bonding agent</td>
<td>None required</td>
</tr>
</tbody>
</table>

RECOMMENDED TOOLING

For drilling pilot hole
Rotary percussion 3-jaw-chuck drill

ANCHOR SELECTION  Masonry – Masonry

<table>
<thead>
<tr>
<th>Maximum Cavity Standard Masonry *</th>
<th>Nominal Anchor Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inс</td>
<td>Inс</td>
</tr>
<tr>
<td>1 1/4”</td>
<td>4 1/4”</td>
</tr>
<tr>
<td>2 1/4”</td>
<td>5 1/4”</td>
</tr>
<tr>
<td>3 1/4”</td>
<td>6 1/4”</td>
</tr>
<tr>
<td>4 1/4”</td>
<td>7 1/4”</td>
</tr>
<tr>
<td>5 1/4”</td>
<td>8 1/4”</td>
</tr>
<tr>
<td>6 1/4”</td>
<td>9 1/4”</td>
</tr>
<tr>
<td>7 1/4”</td>
<td>10 1/4”</td>
</tr>
<tr>
<td>8”</td>
<td>11”</td>
</tr>
</tbody>
</table>

Minimum cavity is dependant on the width of the facade and the maximum depth that can be drilled into the backup material.

TYPICAL PERFORMANCE  Average of 20 tests

<table>
<thead>
<tr>
<th>Substrate material</th>
<th>Compressive strength psi</th>
<th>Pull Out Lbf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Brick</td>
<td>7250</td>
<td>1325+ **</td>
</tr>
<tr>
<td>Brick</td>
<td>3990</td>
<td>1127</td>
</tr>
<tr>
<td>Soft Brick</td>
<td>2465</td>
<td>818</td>
</tr>
<tr>
<td>Reinforced Concrete</td>
<td>7250</td>
<td>1105</td>
</tr>
<tr>
<td>Precast Concrete</td>
<td>2900</td>
<td>1150</td>
</tr>
<tr>
<td>CMU 15 MPa</td>
<td>2175</td>
<td>600</td>
</tr>
<tr>
<td>CMU – LW</td>
<td>1015</td>
<td>398</td>
</tr>
<tr>
<td>Pavers</td>
<td>--</td>
<td>990</td>
</tr>
<tr>
<td>1” Travertine</td>
<td>--</td>
<td>400</td>
</tr>
</tbody>
</table>

* For the purposes of this table the masonry strength has been assumed to be 1,000 psi. Weaker masonry will require the expander to be embedded deeper to avoid breakout, reducing the maximum cavity for a particular length of anchor.

** Limit of test equipment
### Brick to Steel Stud

**PRODUCT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Material</th>
<th>Austenitic stainless steel Grade 304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>11/64&quot;</td>
</tr>
<tr>
<td>Length</td>
<td>Façade thickness + cavity width +</td>
</tr>
<tr>
<td></td>
<td>backup penetration of 3/8&quot;</td>
</tr>
<tr>
<td>Diameter of clearance hole, façade and backup</td>
<td>7/16&quot;</td>
</tr>
<tr>
<td>Depth of clearance hole</td>
<td>All of the façade</td>
</tr>
<tr>
<td>Fixing density</td>
<td>To engineer’s specification</td>
</tr>
<tr>
<td>Bonding agent</td>
<td>None required</td>
</tr>
</tbody>
</table>

**RECOMMENDED TOOLING**

- For drilling pilot hole: Rotary percussion 3-jaw-chuck drill
- For drilling hole in steel stud: 3/16" drill bit

### Veneer Panel Anchor

**PRODUCT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Material</th>
<th>Austenitic stainless steel Grade 304</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>11/64&quot;</td>
</tr>
<tr>
<td>Length</td>
<td>Panel thickness + cavity width +</td>
</tr>
<tr>
<td></td>
<td>backup material penetration of 1 3/8&quot;</td>
</tr>
<tr>
<td>Diameter of clearance hole, façade and backup</td>
<td>7/16&quot;</td>
</tr>
<tr>
<td>Depth of clearance hole</td>
<td>Length of TorkFix + 1/2&quot;</td>
</tr>
<tr>
<td>Fixing density</td>
<td>To engineer’s specification</td>
</tr>
<tr>
<td>Bonding agent</td>
<td>None required</td>
</tr>
</tbody>
</table>

**RECOMMENDED TOOLING**

- For drilling pilot hole: Rotary percussion 3-jaw-chuck drill

### Anchor Selection: Masonry – Steel

**Cavity Range**

<table>
<thead>
<tr>
<th>Nominal Anchor Length</th>
<th>1 1/2&quot;</th>
<th>4 1/2&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ins</td>
<td>1 1/2&quot;</td>
<td>4 1/2&quot;</td>
</tr>
<tr>
<td>Ins</td>
<td>2 1/2&quot;</td>
<td>5 1/2&quot;</td>
</tr>
<tr>
<td>3 1/2&quot;</td>
<td>6 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4 1/2&quot;</td>
<td>7 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>5 1/2&quot;</td>
<td>8 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>6 1/2&quot;</td>
<td>9 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>7 1/2&quot;</td>
<td>10 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>8&quot;</td>
<td>11&quot;</td>
<td></td>
</tr>
</tbody>
</table>

**Typical Performance** Average of 20 tests

<table>
<thead>
<tr>
<th>Substrate Material</th>
<th>Compressive strength</th>
<th>Pull Out Lbf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Brick</td>
<td>7250</td>
<td>1325+ *</td>
</tr>
<tr>
<td>Brick</td>
<td>3990</td>
<td>1127</td>
</tr>
<tr>
<td>Soft Brick</td>
<td>2465</td>
<td>818</td>
</tr>
<tr>
<td>Reinforced Concrete</td>
<td>7250</td>
<td>1105</td>
</tr>
<tr>
<td>Precast Concrete</td>
<td>2900</td>
<td>1150</td>
</tr>
<tr>
<td>CMU 15 MPa</td>
<td>2175</td>
<td>600</td>
</tr>
<tr>
<td>CMU – LW</td>
<td>1015</td>
<td>398</td>
</tr>
<tr>
<td>Pavers</td>
<td>--</td>
<td>990</td>
</tr>
<tr>
<td>1” Travertine</td>
<td>--</td>
<td>400</td>
</tr>
</tbody>
</table>

* Limit of test equipment

### Anchor Selection: Veneer – Masonry

**From underside of head to face of backup material ‘C’**

<table>
<thead>
<tr>
<th>Nominal Anchor Length</th>
<th>Ins</th>
<th>3&quot;</th>
<th>4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ins</td>
<td>4 1/2&quot;</td>
<td>5 1/2&quot;</td>
</tr>
<tr>
<td></td>
<td>Other lengths available to order</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Typical Performance** Average of 20 tests

<table>
<thead>
<tr>
<th>Substrate Material</th>
<th>Compressive strength</th>
<th>Pull Out Lbf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Brick</td>
<td>7250</td>
<td>1325+ *</td>
</tr>
<tr>
<td>Brick</td>
<td>3990</td>
<td>1127</td>
</tr>
<tr>
<td>Soft Brick</td>
<td>2465</td>
<td>818</td>
</tr>
<tr>
<td>Reinforced Concrete</td>
<td>7250</td>
<td>1105</td>
</tr>
<tr>
<td>Precast Concrete</td>
<td>2900</td>
<td>1150</td>
</tr>
<tr>
<td>CMU 15 MPa</td>
<td>2175</td>
<td>600</td>
</tr>
<tr>
<td>CMU – LW</td>
<td>1015</td>
<td>398</td>
</tr>
</tbody>
</table>

* Limit of test equipment
CemTie

CemTie is a fully grouted reinforcement tie suitable for use in a wide variety of situations. Installation involves drilling clearance holes of the required depth into the affected masonry and then inserting and simultaneously installing the CemTie and the HeliBond cementitious grout to produce a fully grouted tie.

APPLICABLES
- Stabilizing solid or rubble filled walls
- Reinstating failed lintels (when combined with HeliBeam techniques)
- Securing multi-layer brick rings in bridges, tunnels and arches
- Reconnecting separated internal and external building walls
- Securing delaminated masonry
- Repairing and securing cornices and decorative fascias
- Securing parapet walls and copings

FEATURES AND BENEFITS
- Stainless steel tie up to 48” long as standard
- Quick, easy, non-disruptive installation
- Tie and grout installed simultaneously
- Ideal for overhead installations
- Highly cost-effective masonry stabilization technique
- Much quicker and simpler than alternative methods
- Fully concealed for sympathetic repairs
- Minimal disturbance to building fabric
- Fully concealed for sympathetic repairs
- CemTie plus HeliBond grout produces great tensile strength
- Flexible to allow normal structural movements

PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Material</th>
<th>Austenitic stainless steel grade 304 as standard (grade 316 available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>8.0 (5/16”) and 10.0mm (3/8”) standard</td>
</tr>
<tr>
<td>Stock Length</td>
<td>Cut lengths up to 48”</td>
</tr>
<tr>
<td>Required Length</td>
<td>2” less than the materials being tied</td>
</tr>
<tr>
<td>Bonding agent</td>
<td>HeliBond cementitious grout</td>
</tr>
</tbody>
</table>
Seismic Connector

APPLICATIONS
- For strengthening cavity wall constructions, in both new build and remedial applications, to provide improved structural performance and meet current seismic requirements.

FEATURES AND BENEFITS
- Simple and straightforward to install
- Non-disruptive – requires no taking down and rebuilding
- Strong, reliable connection with backup material
- Additional strength created in the facade
- Positive lock with easy overlap for long runs
- Fully concealed and visually appealing

The Seismic Connector is for connecting HeliBar reinforcement, installed into masonry to distribute stresses and provide in-plane strength, to wall ties, installed to provide out-of-plane restraint. The system is suitable for both new build and remedial applications.

In new build, Seismic Connectors are fitted to newly installed 8mm (5/16”) DryFix ties and threaded together with HeliBar reinforcement as the outer wythe is constructed.

In remedial settings, DryFix ties are installed before the connectors are fitted and threaded together with HeliBar installed into channelled out mortar joints. HeliBond grout is used to bond the system in place.

PRODUCT SPECIFICATIONS

<table>
<thead>
<tr>
<th>Facade Substrate</th>
<th>Backup Material</th>
<th>Far Wythe Pilot/Clearance Hole</th>
<th>Penetration into Backup</th>
<th>Pull Out (Proof Load)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay Brick</td>
<td>Aircrete</td>
<td>None</td>
<td>3” – 3½”</td>
<td>1.0kN</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Wood Stud</td>
<td>None</td>
<td>2”</td>
<td>1.2kN</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Clay Brick</td>
<td>5-6mm (7/16” – 1/4&quot;)</td>
<td>2½”</td>
<td>2.0kN</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Concrete Block</td>
<td>6mm (1/4”)</td>
<td>2”</td>
<td>2.0kN</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Concrete</td>
<td>6-6.5mm (1/4”)</td>
<td>1½”</td>
<td>2.0kN</td>
</tr>
</tbody>
</table>

NOTE: 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. Compression Resistance should be checked with the Helifix Technical Department. Fixing Density should be calculated by the Helifix Technical Department.

Minimum fixing density: In accordance with project specification or check with Helifix Technical Department

Bonding agent: HeliBond Grout
**PatchPin**

**APPLICATIONS**
- Stainless steel helical pin for providing a strong mechanical key when patch repairing reinforced concrete

**FEATURES AND BENEFITS**
- Forms powerful bond with patching mortar
- Additional mechanical bonding security
- Can be installed vertically or angled and bent after installation, if required
- Requires no chemicals
- Quick, simple and effective

**PRODUCT SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Material</th>
<th>Austenitic stainless steel Grade 304 (316 available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>8mm (5/16&quot;)</td>
</tr>
<tr>
<td>Length</td>
<td>70mm (3&quot;) as standard – 100mm (4&quot;) also available</td>
</tr>
<tr>
<td>Diameter of pilot hole</td>
<td>6.5mm (1/4&quot;)</td>
</tr>
<tr>
<td>Depth of pilot hole</td>
<td>2&quot;</td>
</tr>
<tr>
<td>Pin spacing and positioning</td>
<td>Can be varied according to site conditions but should start 50mm (2&quot;) from the edge of the patched area</td>
</tr>
<tr>
<td>Pin density</td>
<td>Intermediate pins should be at 6&quot;- 8&quot; center spacing. Extra pins may be used at the discretion of the engineer / site manager. There should be a minimum of two pins per patch.</td>
</tr>
</tbody>
</table>

**STEP 1** Remove all loose concrete from the area to be patched. Hammer tap the area to establish if any hollows are present and break back to sound concrete. Remove any dust and debris with a stiff wire brush. Clean and treat any exposed embedded steel rebar with a suitable epoxy coating.

**STEP 2** Drill pilot holes, vertically or at an angle of up to 45°, to the correct diameter and spacing into the concrete (using an SDS rotary hammer drill).

**STEP 3** Fit the PatchPin drill sleeve driver over the drill bit and insert the PatchPin into the tool. Install the PatchPin into the 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.

**STEP 4** Apply the patching mortar, as required, in accordance with the Manufacturer’s instructions. Fill all gaps and make good the surface.
HeliBond cementitious grout is a high performance non-shrink, non-gassing, thixotropic cement based grout for bonding metal components into common masonry substrates.

**APPLICATIONS**
- For bonding metal components into masonry type substrates
- Used to bond HeliBars into masonry for crack stitching, lintel repair and creation, masonry beaming and CemTie installation

**FEATURES AND BENEFITS**
- Non-shrink, non-gassing, thixotropic grout
- Flows easily under pressure to fill voids
- Rapidly develops compressive strength
- Cures to 6525 PSI
- Ready-to-mix components supplied in two-pack sets to reduce waste

**PERFORMANCE DATA**

<table>
<thead>
<tr>
<th>Performance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive strength</td>
<td>2 days – 2175 PSI</td>
</tr>
<tr>
<td></td>
<td>7 days – 3625 PSI</td>
</tr>
<tr>
<td></td>
<td>28 days – 6525 PSI</td>
</tr>
<tr>
<td>Pot life</td>
<td>2 hours at 68°F</td>
</tr>
<tr>
<td>Storage conditions</td>
<td>Cool, dry, frost-free conditions away from direct sunlight</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>41°F to 77°F</td>
</tr>
<tr>
<td>Pail storage</td>
<td>Pails to be stacked no more than four high</td>
</tr>
<tr>
<td>Shelf life</td>
<td>12 months under normal conditions</td>
</tr>
<tr>
<td>Pack size</td>
<td>3.0 litres and 4.5 litres</td>
</tr>
</tbody>
</table>

**RECOMMENDED TOOLING**

- For mixing components: Power drill and paddle mixer
- For injection into slots: Helifix Pointing Gun Kit – CS
- For injection into holes: Helifix Pointing Gun kit – HD

Also available with pneumatic power

**HEALTH AND SAFETY**
HeliBond contains Portland Cement and is therefore alkaline when wet. Unnecessary skin contact should be avoided. In case of eye contact, the eye must be rinsed thoroughly with water and medical attention sought.

A separate Health & Safety Data sheet is available on request.
Installation

Installation details are available for all Helifix 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/downloads
Concrete patching using PatchPins

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 (1/4”) 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.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PatchPin</td>
<td>Stainless steel pin for concrete patching</td>
</tr>
</tbody>
</table>

**RECOMMENDED TOOLING**

For drilling .......................................................... SDS rotary hammer drill
For installation of PatchPin .................................. SDS rotary hammer drill and PatchPin Support Tool

**SPECIFICATION NOTES**

The following criteria are to be used unless specified otherwise:

A. Pins should penetrate 30 – 50mm (1” – 2”) 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 (2”) from the edge of the patched area.

D. Intermediate pins should be at 150 – 200mm (6” – 8”) centers. 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.
Crack stitching a wall using HeliBars and HeliBond

Method Statement

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.* Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond.

2. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

4. Fit the mortar nozzle to the pointing gun.

5. Inject a bead of HeliBond grout, 10-15mm (3/8” – 5/8”) deep, into the back of the slot.

6. Push the HeliBar into the grout to obtain good coverage.

7. 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 (3/8” – 5/8”) for new pointing.

8. 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.

**SPECIFICATION NOTES**

The following criteria are to be used unless specified otherwise:

A. HeliBar diameter 6mm (1/4”) as standard.

B. Depth of slot and slot spacing as per Depth and Spacing Guide.

C. Height of slot to equal mortar joint height, with a minimum of 8mm (1/16”).

D. HeliBar to be long enough to extend a minimum of 500mm (20”) either side of the crack or 500mm (20”) beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.

E. For solid masonry in excess of 230mm (9”) and in a cavity wall where both wythes are cracked, the wall must be crack stitched on both sides.

F. Where a crack is less than 500mm (20”) from the end of a wall or an opening the HeliBar is to be continued for at least 200mm (8”) around the corner and bonded into the adjoining wall or bent back and fixed into the reveal, avoiding any DPC.

G. 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 should be carried out just prior to injecting the HeliBond grout.

H. Do not use HeliBond when the air temperature is +39°F 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.

### Slot Depth and Vertical Spacing

<table>
<thead>
<tr>
<th>Slot Depth</th>
<th>Single Wythe</th>
<th>Solid / Multi-Wythe Masonry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 110mm (4 1/2”)</td>
<td>110 to 230mm (4 1/2” – 9”)</td>
</tr>
<tr>
<td>25–35mm</td>
<td>25–40mm</td>
<td>25–40mm</td>
</tr>
<tr>
<td>(1” – 1 3/8”)</td>
<td>(1” – 1 1/2”)</td>
<td>(1” – 1 1/2”) On both sides</td>
</tr>
</tbody>
</table>

Vertical Spacing: Every 4 brick courses (340mm (13”) approx.)

**Recommended Tooling**

- For cutting slots: Chisel, mortar saw or angle grinder with dust guard and vacuum
- For mixing HeliBond: Drill with mixing paddle
- For injection of HeliBond into slots: Helifix Pointing Gun with mortar nozzle
- For smoothing pointing: Standard finger trowel

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<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HeliBar</td>
<td>Helical stainless steel reinforcement</td>
</tr>
<tr>
<td>HeliBond</td>
<td>Injectable cementitious grout</td>
</tr>
</tbody>
</table>

---

**Method Statement**

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.* Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond.

2. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

4. Fit the mortar nozzle to the pointing gun.

5. Inject a bead of HeliBond grout, 10-15mm (3/8” – 5/8”) deep, into the back of the slot.

6. Push the HeliBar into the grout to obtain good coverage.

7. 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 (3/8” – 5/8”) for new pointing.

8. 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.

**Recommended Tooling**

- For cutting slots: Chisel, mortar saw or angle grinder with dust guard and vacuum
- For mixing HeliBond: Drill with mixing paddle
- For injection of HeliBond into slots: Helifix Pointing Gun with mortar nozzle
- For smoothing pointing: Standard finger trowel

**Method Statement**

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.* Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond.

2. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

4. Fit the mortar nozzle to the pointing gun.

5. Inject a bead of HeliBond grout, 10-15mm (3/8” – 5/8”) deep, into the back of the slot.

6. Push the HeliBar into the grout to obtain good coverage.

7. 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 (3/8” – 5/8”) for new pointing.

8. 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.

**Recommended Tooling**

- For cutting slots: Chisel, mortar saw or angle grinder with dust guard and vacuum
- For mixing HeliBond: Drill with mixing paddle
- For injection of HeliBond into slots: Helifix Pointing Gun with mortar nozzle
- For smoothing pointing: Standard finger trowel

**Method Statement**

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.* Ensure that as much mortar is removed as possible from the exposed brick surfaces in order to provide a good masonry/grout bond.

2. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

4. Fit the mortar nozzle to the pointing gun.

5. Inject a bead of HeliBond grout, 10-15mm (3/8” – 5/8”) deep, into the back of the slot.

6. Push the HeliBar into the grout to obtain good coverage.

7. 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 (3/8” – 5/8”) for new pointing.

8. 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.
Crack stitching a stuccoed wall using HeliBars and HeliBond

Method Statement

1. Using an appropriate power cutting tool with vacuum attachment, cut slots through the stucco and into the masonry to the specified depth and at the required vertical spacing. Ensure the masonry surfaces are clean to ensure a good bond. HeliBars and HeliBond must be installed in the masonry and never in the stucco.

2. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

4. Hold the mortars nozzle to the pointing gun.

5. Inject a bead of HeliBond grout, 10–15mm (3/8” – 5/8”) deep, into the back of the slot.

6. Push the HeliBar into the grout to obtain good coverage.

7. 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 (3/8” – 5/8”) for making good the stucco.

8. 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

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HeliBar</td>
<td>Helical stainless steel reinforcement</td>
</tr>
<tr>
<td>HeliBond</td>
<td>Injectable cementitious grout</td>
</tr>
</tbody>
</table>

RECOMMENDED TOOLING

For cutting slots ...........................................Chisel, mortar saw or angle grinder with dust guard and vacuum

For mixing HeliBond ................................................Drill with mixing paddle

For injection of HeliBond into slots ..........................Helifix Pointing Gun with mortar nozzle

For smoothing pointing .............................................Standard finger trowel

SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

A. HeliBar diameter 6mm (1/4”) as standard.
B. Depth of slot and slot spacing as per Depth and Spacing Guide.
C. Height of slot to equal mortar joint height, with a minimum of 8mm (5/16”).
D. HeliBar to be long enough to extend a minimum of 500mm (20”) beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.
E. For solid masonry in excess of 230mm (9”) and in a cavity wall where both wythes are cracked, the wall must be crack stitched on both sides.
F. Where a crack is less than 500mm (20”) from the end of a wall or an opening the HeliBar is to be continued for at least 200mm (8”) around the corner and bonded into the adjoining wall or bent back and fixed into the reveal, avoiding any DPC.
G. 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 should be carried out just prior to injecting the HeliBond grout.
H. Do not use HeliBond when the air temperature is +39°F 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.
Stitching or strengthening corners using HeliBars and HeliBond

Method Statement

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.* 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 stuccoed and the mortar joints are not visible, cut the horizontal slots through the stucco and into the masonry. HeliBars and HeliBond must be installed in the masonry and never in the stucco.

2. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Cut the HeliBar to the required length and bend to fit slots.

4. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

5. Fit the mortar nozzle to the gun.

6. Inject a bead of HeliBond grout, 10–15mm (3/8” – 5/8”) deep, into the back of the slot.

7. Push the HeliBar into the grout to obtain good coverage.

8. 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 (3/8” – 5/8”) for new pointing.

9. Point up the remaining slot with a suitable matching mortar.

10. 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 slots ..............................Chisel, mortar saw or angle grinder
with dust guard and vacuum

For mixing HeliBond ..............................Drill with mixing paddle

For injection of HeliBond into slots ..............................Helifix Pointing Gun with mortar nozzle

For smoothing pointing ..............................Standard finger trowel

SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

A. HeliBar diameter 6mm (1/4”) as standard.

B. Depth of slot into the masonry to be 25mm to 35mm (1” – 1 3/8”).

C. Height of slot to equal mortar joint height, with a minimum of 8mm (5/16”).

D. HeliBar to be long enough to suit specific engineering design or extend a minimum of 500mm (20”) either side of any crack or 500mm (20”) beyond the outer cracks if two or more adjacent cracks are being stitched using one rod.

E. Normal vertical spacing is 340mm (13”) (4 brick courses).

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 slot should be carried out just prior to injecting the HeliBond grout.

G. Do not use HeliBond when the air temperature is +39°F 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.
Repair of a crack near a corner in a cavity wall using DryFix

Method Statement

1. Mark the points for Dryfix installation on the face of the wall.
2. Drill an appropriate diameter pilot hole (typically 5mm, (3/16") subject to confirmation on site) into the existing wall to the specified depth using a light-weight rotary percussion drill.
3. Attach the Helifix Power Driver Attachment to an SDS hammer drill set to a slow speed and light hammer only.
4. Load 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 facade by the insertion tool.
6. 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, depending on the width of the crack and the surface made good or left ready for any decoration.

NOTE: Avoid leaning or pushing heavily on the drill during operation to ensure the accuracy of the hole’s diameter.

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.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DryFix</td>
<td>Stainless steel dry pinning system</td>
</tr>
</tbody>
</table>

RECOMMENDED TOOLING
For drilling .................................................. Rotary percussion drill
For installation of Dryfix ................................. SDS rotary hammer drill and Dryfix Power Driver Attachment

*SPECIFICATION NOTES
The following criteria are to be used unless specified otherwise:
A. DryFix ties are to be installed at a vertical spacing of 170mm (7") (every 2 brick courses).
B. DryFix ties are to extend at least 70mm (3") past the crack.
C. Diameter of pilot hole to be determined on site – typically 5mm (3/16"). The appropriate diameter will depend on the diameter of the DryFix tie and brick density. Obtainable pull out loads can be tested using a Helifix Load Test Unit.
D. Depth of pilot hole to be DryFix tie length + 10mm (3/8").
E. DryFix ties are to be installed at least 25mm (1") in from the brick edge.
F. If cracking occurs on both elevations consider using HeliBar crack stitching around the corner. If DryFix ties are to be used, they should be staggered between each elevation.

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.
Cross stitching a cracked solid wall using CemTies

Method Statement

1. Mark the points for CemTie installation on the face of the wall. *
2. Drill a 14mm (9/16") clearance hole (16 – 18mm (5/8” – 3/4") if CemTie 600mm (24") or longer) at the required location and angle, and to the specified depth. *
3. Clean out all dust from the hole and thoroughly flush with water.
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.
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 drilling ..................................................... SDS rotary hammer drill
For mixing HeliBond ...................................................Drill with mixing paddle
For insertion of the CemTies .......................... Helifix 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 perpendicular to the direction of the plane of the crack (e.g. in the horizontal plane for vertical cracks and in the vertical plane for horizontal cracks).
B. CemTies are to start a minimum of 225mm (9") away from the crack.
C. Depth of hole to be CemTie length + 25mm (1").
D. Angle of drilling to be such that the CemTies will pass through the crack within the center third of the wall.
E. CemTies are to start from alternate sides of the crack and to be at 225mm (9") spacing measured along the length of the crack.
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 +39°F 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.
Repair of crack near a corner in a solid wall using CemTies

Method Statement

1. Mark the points for CemTie installation on the face of the wall.*
2. Drill a 14mm (9/16") clearance hole 16 – 18mm (5/8” – 11/16") if CemTie 600mm (24") or longer at the required location and angle, and to the specified depth.**
3. Clean out all dust from the hole and thoroughly flush with water.
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.
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.

Product Description

<table>
<thead>
<tr>
<th>Product</th>
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<tbody>
<tr>
<td>CemTie</td>
<td>Helical stainless steel pin</td>
</tr>
<tr>
<td>HeliBond</td>
<td>Injectable cementitious grout</td>
</tr>
</tbody>
</table>

RECOMMENDED TOOLING

For drilling ............................................. SDS rotary hammer drill
For mixing HeliBond ........................................... Drill with mixing paddle
For injection of HeliBond into slots ...............Helifix 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 (17”).
B. CemTies are to extend an equal distance, and typically to not more than 500mm (20”), either side of the crack.
C. Depth of hole to be CemTie length + 25mm (1”).
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 should be carried out just prior to inserting the CemTie.
G. Do not use HeliBond when the air temperature is +39°F 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.
Creating a masonry beam in single wythe masonry using HeliBars

Method Statement

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/stuccoed and the mortar joints are not visible, cut the horizontal slots through any plaster/stucco 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. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

4. Fit the mortar nozzle to the pointing gun.

5. Inject a bead of HeliBond cementitious grout, 10–15mm (3/8” – 5/8”) deep, into the back of the slot.

6. Push the first 6mm (1/4”) HeliBar into the grout to obtain good coverage.

7. Inject a second bead of HeliBond grout over the exposed HeliBar.

8. Push the second 6mm (1/4”) HeliBar into the grout to obtain good coverage.

9. 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 (3/8” – 5/8”) for new pointing.

10. Point up the remaining slot with a suitable matching mortar.

11. 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 slots ...........................................Chisel, mortar saw or angle grinder with dust guard and vacuum

For mixing HeliBond ..................................................Drill with mixing paddle

For injection of HeliBond into slots .....................Helifix Pointing Gun with mortar nozzle

For smoothing pointing ..............................................Standard finger trowel

Specification Notes

The following criteria are to be used unless specified otherwise:

A. A minimum of two HeliBars should be installed into each cut slot.

B. Depth of slot into the masonry to be 40mm to 55mm (1 1/2” – 2”) + the thickness of any plaster or stucco.

C. Height of slot to equal full mortar joint height, with a minimum of 8mm (5/16”).

D. If HeliBars are to be joined in a straight run, overlap the bars by a minimum of 500mm (20”).

E. Top and bottom reinforcements should be positioned as far apart as practicable, up to a maximum distance equivalent to 10 brick courses (approx. 850mm – 26”).

F. Any fractures in the masonry within the ‘beam zone’ MUST be stabilized by crack stitching or masonry replacement.

G. Any missing or very poor quality masonry MUST be replaced.

H. Multiple Helibeamss should be installed starting at the top and working down to the bottom.

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 slot should be carried out just prior to injecting the HeliBond grout.

J. Do not use HeliBond when the air temperature is +39°F 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.

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<tr>
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Product Description

HeliBar

Helical stainless steel reinforcement

HeliBond

Injectable cementitious grout

For more information, telephone our technical support team on TOLL FREE: 888-992-9989, or visit WWW.HELIFIX.COM
Creating a masonry beam in solid, multi-wythe masonry using HeliBars

Method Statement

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/stuccoed and the mortar joints are not visible, cut the horizontal slots through any plaster/stucco 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. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix pointing Gun.

4. Fit the mortar nozzle to the pointing gun.

5. Inject a bead of HeliBond cementitious grout, 10 – 15mm (3/8” – 5/8”) deep, into the back of the slot.

6. Push the first 6mm (1/4”) HeliBar into the grout to obtain good coverage.

7. Inject a second bead of HeliBond grout over the exposed HeliBar.

8. Push the second 6mm (1/4”) HeliBar into the grout to obtain good coverage.

9. 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 (3/8” – 5/8”) for new pointing.

10. Point up the remaining slot with a suitable matching mortar.

11. 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.

**SPECIFICATION NOTES**

The following criteria are to be used unless specified otherwise:

A. A minimum of two HeliBars should be installed into each cut slot.

B. Depth of slot into the masonry to be 55mm to 70mm (2” – 3”) + the thickness of any plaster or stucco.

C. Height of slot to equal full mortar joint height, with a minimum of 8mm (5/32”).

D. If HeliBars are to be joined in a straight run, overlap the bars by a minimum of 500mm (20”).

E. Top and bottom reinforcements should be positioned as far apart as practicable, up to a maximum distance equivalent to 10 brick courses (approx. 850mm – 26”).

F. Any fractures in the masonry within the ‘beam zone’ MUST be stabilized by crack stitching, or masonry replacement.

G. Any missing or very poor quality masonry MUST be replaced.

H. Install Helifix remedial wall ties if existing ties are defective in any way.

I. Multiple Helibeamsthould be installed starting at the top and working down to the bottom.

J. 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 should be carried out just prior to injecting the HeliBond grout.

K. Do not use HeliBond when the air temperature is +39°F 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.
Method Statement

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/stuccoed and the mortar joints are not visible, cut the horizontal slots through any plaster/stucco 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. Clean out all dust and loose mortar from the slots and thoroughly flush with water.

3. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

4. Fit the mortar nozzle to the pointing gun.

5. Inject a bead of HeliBond cementitious grout, 10–15mm (3/8" – 5/8") deep, into the back of the slot.

6. Push the first 6mm (1/4") HeliBar into the grout to obtain good coverage.

7. Inject a second bead of HeliBond grout over the exposed HeliBar.

8. Push the second 6mm (1/4") HeliBar into the grout to obtain good coverage.

9. 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 (3/8" – 5/8") for new pointing.

10. Repeat steps 5 to 9 for remaining slots.

11. Point up the remaining slots with a suitable matching mortar.

12. 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.

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### RECOMMENDED TOOLING

- **For cutting slots** ........................................Chisel, mortar saw or angle grinder with dust guard and vacuum
- **For mixing HeliBond** ........................................Drill with mixing paddle
- **For injection of HeliBond into slots** .....................Helifix Pointing Gun with mortar nozzle
- **For smoothing pointing** .....................................Standard finger trowel

### SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- **A.** Depth of slot into masonry to 40mm to 55mm (1 1/2" – 2")
- **B.** Height of slot to equal full mortar joint height, with a minimum of 8mm (5/16").
- **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 – 26").
- **D.** HeliBar to be long enough to extend a minimum of 500mm (20") beyond each side of the opening.
- **E.** Any fractures in the masonry within the 'beam zone' MUST be stabilized by crack stitching, or masonry replacement.
- **F.** Any missing or very poor quality masonry MUST be replaced.
- **G.** 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 should be carried out just prior to injecting the HeliBond.

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.
Stabilizing brick arch lintels using HeliBars and CemTies

Method Statement

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/stuccoed and the mortar joints are not visible, cut the horizontal slots through any plaster/stucco 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 (9/16") clearance holes 16 – 18mm (5/8"– 11/16") if CemTie 600mm (24") 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 (2") 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.

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 (3/8" – 5/8") deep, into the back of the slot.

8. Push the first 6mm (1/4") 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 (1/4") 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 (3/8" – 5/8") 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.

SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

A. Depth of slot into masonry to 40mm to 55mm (1 1/2" – 2").

B. Height of slot to equal full mortar joint height, with a minimum of 8mm (5/16").

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 – 26").

D. HeliBar to be long enough to extend a minimum of 500mm (20") beyond each side of the opening.

E. Any fractures in the masonry within the 'beam zone' MUST be stabilized by crack stitching, 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 (2") into the course of masonry above the reinforcement.

H. Depth of hole to be CemTie length + 25mm (1").

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 should be carried out just prior to injecting the HeliBond.

J. Do not use HeliBond when the air temperature is +39°F 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.
Masonry arch pinning using CemTies

Method Statement

1. Mark the points for CemTie installation onto the underside of the arch.*
2. Drill a clearance hole at the required location and to the specified depth and diameter.*
3. Clean out all dust from the holes and thoroughly flush with water.
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.
10. Clean tools with clean, fresh water.

NOTE: If there is a lot of movement in the arch then the ties will have to be installed in phases. After each phase the ties should be left for 24 hours for the grout to achieve initial set. After 24 hours continue with the next phase.

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.

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:
A. Place CemTies on a staggered 450mm (18”) x 450mm (18”) grid. Any loose bricks should also be pinned.
B. CemTie length to be sufficient to penetrate at least 75mm (3”) into sound brickwork.
C. Clearance hole diameter to be:

<table>
<thead>
<tr>
<th>Drilled Hole Diameter</th>
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<tr>
<td>14mm (9/16”)</td>
<td>Up to 600mm (24”)</td>
</tr>
<tr>
<td>16–18mm (5/8” – 11/16”)</td>
<td>600 to 1000mm (24” to 40”)</td>
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<tr>
<td>18mm (11/16”)</td>
<td>1000 to 1200mm (40” to 48”)</td>
</tr>
</tbody>
</table>

D. Depth of hole to be CemTie length + 25mm (1”).
E. Where arch rings are badly delaminated and/or brickwork is very loose, the CemTies will have to be installed in phases. In this case consideration should be given to using extra ties to help stabilize the brickwork prior to installing the first phase of CemTies. Depending on the condition of the brickwork, it may be possible to use Helifix Dryfix ties for this purpose.
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.
Creating movement joints in cavity walls using HeliBars

Method Statement

1. Mark the position on the wall for the movement joint.
2. Install the specified number of appropriate Helifix wall ties adjacent to the location of the movement joint.*
3. Using an appropriate power cutting tool with vacuum attachment, cut slots into the horizontal mortar joints either side of the movement joint, 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 stuccoed and the mortar joints are not visible, cut the horizontal slots through the stucco and into the masonry.
4. Cut the movement joint to the specified width and at the required location.
5. Clean out all dust and mortar from the slots and thoroughly flush with water.
7. Fit the mortar nozzle to the pointing gun.
8. Inject a bead of HeliBond grout, 10 – 15mm (3/8” – 5/8”) deep, into the back of the slot.
9. Push the 6mm (1/4”) Movement tie into the grout to ensure good coverage. Ensure that no grout penetrates the sleeved section of the tie, as a small void must remain at this end of the tie to allow movement.
10. Inject a second bead of HeliBond grout over the exposed Movement tie to obtain good coverage.
11. Point up the remaining slot with a suitable matching mortar.
12. Seal the joint with a suitable flexible mastic type material.
13. 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.

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

A. Suitable Helifix wall ties to be installed on each side of the newly formed movement joint not more than 225mm (9”) back from the joint and at a maximum of 300mm (12”) vertical spacing.
B. Depth of slot to accommodate the HeliBar Movement Ties to be 40mm (1 1/2”) + the thickness of any stucco.
C. Height of slot to equal full mortar joint height, with a minimum of 8mm (5/16”).
D. Movement Ties should extend a minimum of 200mm (8”) either side of the expansion joint.
E. Alternate the position of the sleeve on adjacent Movement Ties.
F. Movement Ties to be installed at a maximum 300mm (12”) vertical spacing.
G. 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 Cem Tie.
H. Do not use HeliBond when the air temperature is +39°F 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.

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RECOMMENDED TOOLING

For cutting slots ....................................... Chisel, mortar saw or angle grinder with dust guard and vacuum
For mixing HeliBond ........................................ Drill with mixing paddle
For injection of HeliBond into slots ........... Helifix Pointing Gun with mortar nozzle
For smoothing pointing .................................................. Standard finger trowel
Creating movement joints in solid walls using HeliBars

Method Statement

1. Mark the position on the wall for the movement joint.
2. Using an appropriate power cutting tool with vacuum attachment, cut slots into the horizontal mortar joints either side of the movement joint, 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 stuccoed and the mortar joints are not visible, cut the horizontal slots through the stucco and into the masonry.
3. Cut the movement joint to the specified width and at the required location.
4. Clean out all dust and loose mortar from the slots and thoroughly flush with water.
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 gun.
7. Inject a bead of HeliBond grout, 10–15mm (3/8” – 5/8”) deep, into the back of the slot.
8. Push the first 6mm (1/4”) Movement tie into the grout to ensure good coverage. Ensure that no grout penetrates the sleeved section of the tie, as a small void must remain at this end of the tie to allow movement.
9. Inject a second bead of grout over the exposed Movement tie. Again, ensure that no grout penetrates the sleeved section of the tie.
10. Push a second 6mm (1/4”) Movement Tie into the grout.
11. Inject a third bead of HeliBond grout over the exposed Movement Tie to obtain good coverage. Again, ensure that no grout penetrates the sleeved section of the tie.
12. Point up the remaining slot with a suitable matching mortar.
13. Seal the joint with a suitable flexible mastic type material.
14. 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.

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<td>HeliBond</td>
<td>Injectable cementitious grout</td>
</tr>
</tbody>
</table>

RECOMMENDED TOOLING

For cutting slots .................................................Chisel, mortar saw or angle grinder with dust guard and vacuum
For mixing HeliBond ..................................................Drill with mixing paddle
For injection of HeliBond into slots .........................Helifix Pointing Gun with mortar nozzle
For smoothing pointing ..............................................Standard finger trowel

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:
A. Allow for the installation of one HeliBar Movement Tie for each skin of brickwork into each cut slot. By example, a common 230mm (9”) solid wall construction (equivalent to two skins of tied brickwork) will require the installation of two Movement Ties per slot. A solid wall equivalent in depth to three skins of bonded masonry will require three Movement Ties assemblies per slot.
B. Depth of slot to accommodate the HeliBar Movement Ties to be 70mm (3”) + the thickness of any stucco.
C. Height of slot to equal full mortar joint height, with a minimum of 8mm (5/16”).
D. Movement Ties should extend a minimum of 200mm (8”) either side of the movement joint.
E. Alternate the position of the sleeve on adjacent Movement Ties.
F. Movement Ties to be installed at a maximum 300mm (12”) vertical spacing.

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.
Parapet repairs using HeliBars and CemTies

**Method Statement**

1. Mark the positions for the CemTie pins onto the top and face of the wall at the required spacings.*
2. Drill 14mm (9/16") clearance holes 16 – 18mm (5/8”– 11/16") if CemTie 600mm (24") or longer to the specified depth.*
3. 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 stuccoed and the mortar joints are not visible, cut the horizontal slots through the stucco and into the masonry.
4. Clean out all dust and loose mortar from the slots and holes and thoroughly flush with water.
5. 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.
6. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the gun.
7. Pump grout to fill the nozzle.
8. Wind the CemTie into the nozzle and ensure that it is fully covered in grout.
9. Insert the nozzle to the full depth of the drilled hole and pump the grout. Slowly withdraw the nozzle back out of the hole. Back pressure will help to push the nozzle back out of the hole.
10. Remove the pinning nozzle from the gun and fit the mortar nozzle.
11. Inject a bead of HeliBond cementitious grout, 10-15mm (approx. 1/2") deep, into the back of the slot.
12. Push the first HeliBar into the grout to obtain good coverage.
13. Inject a second bead of grout over the exposed HeliBar.
14. Push the second HeliBar into the grout to obtain good coverage.
15. Inject a third bead of grout over the exposed HeliBar and iron it into the slot using a finger trowel. Inject additional HeliBond as necessary, leaving 10-15mm (approx. 1/2") for new pointing.
16. Make good all CemTies holes and point up the remaining slots with matching mortar to suit.
17. 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 slots:** Chisel, mortar saw or angle grinder with dust guard and vacuum
- **For drilling:** SDS rotary hammer drill
- **For mixing HeliBond:** Drill with mixing paddle
- **For insertion of the CemTies:** Helifix Pointing Gun HD with CemTie pinning nozzle
- **For injection of HeliBond into slots:** Helifix Pointing Gun with mortar nozzle
- **For smoothing pointing:** Standard finger trowel

### SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

A. CemTies are to be installed within the center third of the width of the wall and at a horizontal spacing of 600mm (24"). The ties are to extend at least 300mm (12") into the main, or sound, part of the wall.
B. The parapet and supporting wall should be tied into abutting or cross walls where possible.
C. HeliBars are to be installed at a depth of 35mm (1 3/8") to 40mm (1 1/2") (assuming 230mm (9") solid wall) and at a maximum vertical spacing of 340mm (13") (4 brick courses). Add 10mm (3/8") depth for each 100mm (4") of masonry thickness over the common 230mm (9").
D. Height of slot to equal full mortar joint height, with a minimum of 8mm (5/16").
E. If HeliBars are to be joined in a straight run, overlap the bars by a minimum of 500mm (20").
F. Any fractures in the masonry within the ‘beam zone’ MUST be stabilized by crack stitching, or masonry replacement.
G. Depth of hole to be CemTie length + 25mm (1").
H. Any missing or very poor quality masonry MUST be replaced.
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 should be carried out just prior to injecting the HeliBond.

### GENERAL NOTES

- Product details available from Helifix.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.
Tying walls to joist ends using BowTies

Method Statement

1. Mark the positions of the joists on the external wall.
2. Drill the clearance holes for the BowTies (normally 12mm (1/2”) diameter), through the masonry only, in line with the center 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 wood 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 HeliBond Cementitious Grout into the hole to fill it completely.
8. 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.

Product Description

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BowTie</td>
<td>Grade 316 stainless steel helical wall tie</td>
</tr>
<tr>
<td>HeliBond</td>
<td>Injectable cementitious grout</td>
</tr>
</tbody>
</table>

RECOMMENDED TOOLING

For drilling and insertion of BowTie .......................SDS rotary hammer drill
For installation of BowTie ..................................BowTie support tool
For cleaning the clearance hole .............................Airjet and brush
For injection of EpoxyPlus resin ..........................Applicator gun with nozzle

*SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:
A. BowTie penetration into the end grain of the wood joist must be a minimum of 75mm (3”).
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.
Method Statement

1. Mark the points for BowTie HD installation on the face of the wall.*
2. Drill the clearance hole (typically 16mm (5/8”) diameter) through the masonry to line up with the middle third of the wood joist, away from the edges.
3. Clean out the hole to clear any dust or debris.
4. Fit the BowTie HD driver into an SDS hammer drill, set to rotary only, and insert the BowTie HD into the driver.
5. Screw the BowTie HD through the first and second joists (and the third if specified). When the BowTie HD is between joists, take care to avoid ‘whip’.
6. Place the sleeve over the tie and push it to the back of the hole in the masonry with the BowTie Injection Tube.
7. Inject HeliBond Cementitious Grout into the hole to fill it completely.
8. 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, floor or ceiling 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 HD ...................... SDS rotary hammer drill
For installation of BowTie HD ................................. BowTie HD Driver
For cleaning the clearance hole ............................... Airjet and brush
For injection of EpoxyPlus resin ............................. Applicator gun with nozzle

SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

A. BowTie HD penetration into the side grain of the wood joist should be a minimum of 75mm (3”) or the tie should be driven through the joist.
B. BowTie HD spacing to be determined by specific engineering design. The maximum horizontal spacing between BowTies is 600mm (24”).
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.
Securing masonry veneers to brick, concrete block or CMU backup material using TorkFix

Method Statement

1. Mark the position for the TorkFix tie on the face of the facade.
2. Drill a 7/16" diameter pilot hole through the facade, through either the solid brick or mortar joint, and approximately 2½" into the back-up substrate, using a rotary percussion drill (3-jaw-chuck-type).
3. Screw the threaded end of Setting Tool 1 onto the outer end of the anchor.
4. Insert the anchor fully into the hole in the backup material.
5. Turn the Setting Tool 1 until the inner shell has expanded and is tight.
6. Apply the torque wrench to the end of the Setting Tool 1 (1/4" square) to check the torque – usually 36lbf-ins for standard brick but may be increased to 54lbf-ins for harder substrates.
7. Fit Setting Tool 2 over the end nut and turn until the outer shell has expanded and is tight (36-54lbf-ins).
8. Fit the torque wrench to the end of Setting Tool 2 (1/4" square) and check the torque, as before.
9. Make good the hole and seal the surface with color matched mastic or mortar.

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TorkFix</td>
<td>Brick to brick retrofit mechanical repair anchor</td>
</tr>
</tbody>
</table>
**Securing masonry veneers to steel stud using TorkFix**

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TorkFix</td>
<td>Brick to stud retrofit mechanical repair anchor</td>
</tr>
</tbody>
</table>

**Method Statement**

1. Mark the position for the TorkFix tie on the face of the facade
2. Drill a \(\frac{7}{16}\)″ diameter pilot hole through the facade, through either the solid brick or mortar joint, using a rotary percussion drill (3-jaw-chuck-type)
3. Drill a hole in the steel stud using a \(\frac{3}{16}\)″ drill bit
4. Screw the threaded end of Setting Tool 1 onto the outer end of the anchor
5. Insert the anchor through the facade and screw it into the steel stud to a minimum depth of \(\frac{3}{8}\)″
6. Fit hexagon of Setting Tool 2 over the end nut and turn until the outer shell has expanded and is tight
7. Apply the torque wrench to the end of the Setting Tool 2 (\(\frac{1}{4}\)″ square) to check the torque (36-54lb-ins)
8. Make good the hole and seal the surface with color matched mastic or mortar

1. Drill the appropriate clearance hole through the facade
2. Drill a hole in the steel stud using a \(\frac{3}{16}\)″ drill bit
3. Screw the threaded end of Setting Tool 1 onto the outer end of the anchor and screw it into the steel stud to a minimum depth of \(\frac{3}{8}\)″.
4. Fit hexagon of Setting Tool 2 over the end nut and turn until the outer shell has expanded and is tight. Apply the torque wrench to the end of Setting Tool 2 to check the torque.
Pinning rubble-filled walls using CemTies

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.
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 the entry hole with matching materials.
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 drilling ..................................................SDS rotary hammer drill
For mixing HeliBond .................................Drill with mixing paddle
For insertion of the CemTies ..................Helifix 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 (24”) horizontal and 600mm (24”) vertical spacing).
B. The density is to be increased around openings with ties placed at a maximum 300mm (12”) vertical spacing and 225mm (9”) back from the opening.
C. CemTie length should equal 50mm (2”) less than all the materials being tied.
D. Clearance hole diameter to be:

<table>
<thead>
<tr>
<th>CemTie Length</th>
<th>Drilled Hole Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 600mm (24”)</td>
<td>14mm (9/32”)</td>
</tr>
<tr>
<td>600 to 1000mm (24” to 40”)</td>
<td>16–18mm (5/8” – 11/16”)</td>
</tr>
<tr>
<td>1000 to 1200mm (40” to 48”)</td>
<td>18mm (3/4”)</td>
</tr>
</tbody>
</table>

E. Depth of hole to be CemTie length + 25mm (1”).
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.
Method Statement

1. Mark the points for DryFix insertion on the face of the wall.
2. Drill an appropriate diameter pilot hole (typically 5mm (⅜"), subject to confirmation on site) at a 45° angle through the panel/stucco and into the back-up material to the specified depth using an appropriate light-weight electric drill.
3. Attach the angle-faced Helifix Power Driver Attachment to an SDS hammer drill set to hammer only.
4. Load 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 the pre-drilled pilot hole to approximately 2mm (⅛") beyond the surface of the panel/stucco.
6. If required, place masking tape around the hole to protect the surface of the panel/stucco from resin spillage. Place the end of the nozzle of the resin applicator firmly against the hole in the panel. Cloth may also be wrapped around the nozzle to help seal the opening during injection and protect the wall face from resin spillage.

NOTE: Avoid leaning or pushing heavily on the drill during operation to ensure the accuracy of the hole’s diameter and to minimise the risk of cracking the panel.

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 ......................................................... Rotary percussion drill
For installation of DryFix ...................... SDS rotary hammer drill and DryFix Power Driver Attachment

*SPECIFICATION NOTES
The following criteria are to be used unless specified otherwise:
A. DryFix spacings and positions may be varied at the discretion of the specifier to suit site conditions.
B. DryFix ties to be 70mm (3") (subject to confirmation on site).
C. Depth of pilot hole to be DryFix tie length + 10mm (⅛") (subject to confirmation).

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.
Wall tie retrofit using DryFix

Method Statement

1. Mark the points for Dryfix installation on the face of the wall.
2. Drill a 5mm (1/4") diameter pilot hole (subject to confirmation on site) through the facade and into the back-up substrate to the specified depth using a rotary percussion 3-jaw-chuck drill.
3. Fit the Power Driver Attachment to an SDS hammer drill set to hammer only.
4. Load 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 facade 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 facade 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.

Product Description

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DryFix</td>
<td>Stainless steel dry pinning system</td>
</tr>
</tbody>
</table>

Recommended tooling

For drilling ................................................................. Rotary percussion drill
For installation of Dryfix ............................... SDS rotary hammer drill 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.
B. Diameter of pilot hole to be determined on site — typically 5mm (1/4"). The appropriate diameter will depend on the diameter of the Dryfix tie and the density of the facade and back up 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 (1/8").
D. Dryfix length to equal: Facade thickness less 10mm (3/8") + cavity width + back up penetration depending on material, typically 70mm (3"). 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.
- Contact Helifix if your application differs from this repair detail or you require specific technical information.

Drilling Guide

<table>
<thead>
<tr>
<th>Façade Material</th>
<th>Back Up Material</th>
<th>Façade Pilot (mm)</th>
<th>Back Up Pilot (mm)</th>
<th>Back Up Material Penetration (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay Brick</td>
<td>Aircrete</td>
<td>5–6 (1/4&quot; - 1/8&quot;)</td>
<td>None</td>
<td>75–90 (3–3 1/2&quot;)</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Wood Stud</td>
<td>5–6 (1/4&quot; - 1/8&quot;)</td>
<td>None</td>
<td>55 (2&quot;)</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Clay Brick</td>
<td>5–6 (1/4&quot; - 1/8&quot;)</td>
<td>5–6 (1/4&quot; - 1/8&quot;)</td>
<td>70 (3&quot;)</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Concrete Block</td>
<td>5–6 (1/4&quot; - 1/8&quot;)</td>
<td>5–6 (1/4&quot; - 1/8&quot;)</td>
<td>70 (3&quot;)</td>
</tr>
<tr>
<td>Clay Brick</td>
<td>Concrete</td>
<td>6 (1/4&quot;)</td>
<td>6–6.5 (1/4&quot;)</td>
<td>35 (1 1/2&quot;)</td>
</tr>
</tbody>
</table>

NOTE: The smallest possible diameter pilot hole should be used wherever possible. All figures quoted are indicative dependent on the exact nature of the substrate. Testing may be undertaken on site using the Helifix Load Test unit.
Wall tie retrofit using Asymmetric DryFix

Method Statement

1. Mark the points for DryFix installation on the face of the wall.*
2. Drill a 5mm (3/16") diameter pilot hole (subject to confirmation on site) through the facade and into the back-up substrate, to the predetermined depth, using an SDS hammer drill set on hammer and drill.*
3. Fit the Power Driver Attachment to an SDS hammer drill set to hammer only.
4. Load the wider section of the Dryfix tie into the Power Driver Attachment so the blue tip will be driven into the backup material.
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 facade 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 facade 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.

RECOMMENDED TOOLING

For drilling ................................................................. Rotary percussion drill
For installation of DryFix ................................. SDS rotary hammer drill 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.
B. Diameter of pilot hole to be determined on site – typically 5mm (3/16"). The appropriate diameter for the back up material will depend on the diameter of the reduced section of the Asymmetric DryFix tie and the density of the back up material. The diameter of the hole in the facade may be increased to suit the larger diameter section of the tie depending on the density of the facade material. Obtainable pull out loads can be tested using a Helifix Load Test Unit.
C. Depth of pilot hole to be DryFix tie length + 10mm (3/8").
D. DryFix length to equal:
   Facade thickness less 10mm (3/8") + cavity width + back up penetration depending on material, typically 70mm (3")
   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.

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Asymmetric DryFix</th>
<th>Stainless steel dry pinning system</th>
<th>Back Up Material</th>
<th>Pilot (mm)</th>
<th>Penetration into Back Up Material (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Up Material</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay Brick</td>
<td>5–6 (3/16-1/4&quot;)</td>
<td>70 (3&quot;)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Block</td>
<td>5–6 (3/16-1/4&quot;)</td>
<td>70 (3&quot;)</td>
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<td>Concrete</td>
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<td>35 (1 1/2&quot;)</td>
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</table>

NOTE: The smallest possible diameter pilot hole should be used wherever possible. All figures quoted are indicative dependent on the exact nature of the substrate. Testing may be undertaken on site using the Helifix Load Test unit.
Solid wall pinning using DryFix

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DryFix</td>
<td>Stainless steel dry pinning system</td>
</tr>
</tbody>
</table>

**Method Statement**

1. Mark the points for Dryfix insertion on the face of the wall.*
2. Drill a 5mm (3/16") diameter pilot hole (subject to confirmation on site) into the masonry to the specified depth using a rotary percussion 3-jaw-chuck drill.*
3. Fit the Power Driver Attachment to an SDS hammer drill set to hammer only.
4. Load 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 facade by the insertion tool.
6. Make good the entry hole with matching materials.

**RECOMMENDED TOOLING**

For drilling: Rotary percussion drill
For installation of Dryfix: SDS rotary hammer drill 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.
B. Diameter of pilot hole to be determined on site – typically 5mm (3/16”). 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 (3/8").
D. Dryfix length to be sufficient to penetrate 35 – 70mm (1/8” – 3”) into the remote wythe depending on its hardness, with harder materials requiring less penetration. Typically, 70mm (3") 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.
Method Statement

1. Mark the points for Dryfix insertion on the face of the wall.*
2. Drill a 5mm (3/16”) diameter pilot hole (subject to confirmation on site) through the wood using a rotary percussion 3-jaw-chuck drill with appropriate bit.*
3. Drill a 5mm (3/16”) 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 an SDS hammer drill set to 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 wood.

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 facade 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.

RECOMMENDED TOOLING

For drilling: Rotary percussion drill
For installation of Dryfix: SDS rotary hammer drill 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.
B. Diameter of pilot hole to be determined on site—typically 5mm (3/16”). The appropriate diameter will depend on the diameter of the DryFix tie and the density of the near and back up 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 (3/8”).
D. DryFix length to equal:
   Façade thickness less 10mm (3/8”) + cavity width + back up penetration depending on material, typically 70mm (3”)
   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 mortar joint, but they may also be driven into the masonry provided that the mortar joint was weak.

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.
# Wall tie retrofit in a steel frame veneer wall using DryFix and Stud Clip

## Method Statement

1. Mark the position for the DryFix ties on the interior face of brick veneer.
2. Drill an appropriate diameter pilot hole into the brick to a predetermined depth, using a rotary percussion drill (3-jaw-chuck-type). Drilling must be carried out parallel to, and in line with, the solid side section of the steel stud.
3. Fit the special DryFix Power Driver Attachment to an electric hammer drill (SDS type), set to hammer only.
4. Power drive the tie into position.
5. Bend the near end of the tie downwards at an angle of 90° to the side of the steel stud. Secure the tie to the steel stud by means of an angle offset steel bracket (Helifix Stud Clip). The Helifix Stud Clip is to be screwed to the solid side of the steel stud.

### RECOMMENDED TOOLING

- For drilling pilot hole ........................................Rotary percussion 3-jaw-chuck drill
- For installing DryFix ..............................................DryFix power-driver attachment fitted to SDS rotary hammer drill

### SPECIFICATION NOTES

The following criteria are to be used unless specified otherwise:

- **A.** Length of DryFix ties to be sufficient to accommodate 2” penetration into the brick veneer + cavity + sufficient length to accommodate Stud Clip and angled return.
- **B.** Ensure pilot hole is 3” into brick wythe.
- **C.** Diameter of pilot hole to be determined on site, through testing – typically:
  - 8mm (5/32”) diameter tie = 5 – 6.5mm (1/4”)
  - 10mm (3/8”) diameter tie = 8mm (5/32”)
- **D.** DryFix ties to be spaced in accordance with building code requirements to suit site conditions and location.

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.

### Product Description

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DryFix</td>
<td>Helical stainless steel tie</td>
</tr>
<tr>
<td>Stud Clip</td>
<td>Stainless steel bracket</td>
</tr>
</tbody>
</table>
Method Statement

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. 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 stuccoed and the mortar joints are not visible, cut the horizontal slots through the stucco and into the masonry.

2. Where the slot ends at an internal corner drill a 12mm (1/2”) diameter hole at an angle 150mm (6”) into the adjoining wall. If required, drill a 12mm (1/2”) diameter hole through to the external face of the adjoining wall and prepare an additional slot in the external face as per step 1.

3. Clean out all dust and loose mortar from the slots and holes and thoroughly flush with water.

4. Cut the 6mm (1/4”) 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.

5. Mix HeliBond cementitious grout thoroughly using a drill and mixing paddle and load into the Helifix Pointing Gun.

6. Inject a bead of HeliBond grout, 10-15mm (approx 1/2”) deep, into the back of the slot using the mortar nozzle.

7. 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.

8. 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 (approx 1/2”) for new pointing.

9. Inject HeliBond grout into the hole to fill.

10. Point up the remaining slot with a suitable matching mortar and make good the crack using an appropriate Helifix bonding agent or filler.

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.

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**RECOMMENDED TOOLING**

For cutting slots ........................................Chisel, mortar saw or angle grinder with dust guard and vacuum

For mixing HeliBond ........................................Drill with mixing paddle

For injection of HeliBond into slots ...............Helifix Pointing Gun with mortar nozzle

For smoothing pointing ..............................Standard finger trowel

**SPECIFICATION NOTES**

The following criteria are to be used unless specified otherwise:

A. Depth of slot into the masonry to be 25 to 35mm (1” to 1 3/8”) + thickness of any plaster.

B. Height of slot to be equal to full mortar joint height, with a minimum of 8mm (5/16”).

C. HeliBar to be long enough to extend a minimum of 500mm (20”) past the crack and a minimum of 150mm (6”) into the external wall.

D. Normal vertical spacing is 340mm (13”) (4 brick courses).

E. 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 should be carried out just prior to injecting the HeliBond grout.

F. Do not use HeliBond when the air temperature is +39°F and falling or apply over ice. In all instances the slot must be thoroughly damp or primed prior to injection of the HeliBond grout.

G. 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**

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

1. Mark the points for CemTie installation on the face of the wall.*
2. Drill a 16–18mm (5/8”–11/16”) 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.
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.
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 drilling: SDS rotary hammer drill
- For mixing HeliBond: Drill with mixing paddle
- For injection of HeliBond into slots: Helifix 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 400mm (16”).
B. CemTies are to extend a minimum 300mm (12”) past the crack.
C. Depth of hole to be CemTie length + 25mm (1”).
D. CemTies are to be installed within the center 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 +39°F 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.
**LOAD TABLE — TIED ARCH (CONCEALED LINTEL) DESIGN**

<table>
<thead>
<tr>
<th>Courses above HeliBars</th>
<th>Effective Beam Depth (mm)</th>
<th>Number of HeliBars</th>
<th>LINTEL CLEAR SPAN (MM)</th>
<th>Design Moment kNm</th>
<th>Design Shear kN</th>
<th>Ultimate Moment kNm</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1200 (4')</td>
<td>1800 (6')</td>
<td>2400 (8')</td>
<td>3000 (10')</td>
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<tr>
<td>3</td>
<td>253 (10'')</td>
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**TABLE NOTES**

A. The figures presented in this table relate to the structural performance of tied arches constructed from clay masonry and designed in accordance with the Australian masonry codes. Design data has been verified by practical tests on 4.2m clear span beams carried out by the Department of Civil Engineering and Surveying at the University of Newcastle, Australia, under the supervision of Professor A.W. Page.

B. The additional benefits of continuous brickwork and loading over end supports are ignored in this design table but can result in considerable improvements in the performance of the reinforced masonry.

C. HeliBar reinforcement contributes to the strength of the masonry in both the uncracked and cracked state. Masonry only acts as reinforced masonry when some deflection and micro cracking of the masonry has occurred, permitting the steel reinforcement to take effect. This design table limits the deflection to less than Span/300. Further reduction of deflection and micro cracking can be achieved by using additional HeliBars.

D. For design purposes, the characteristic tensile strength (f_{sy}) of the reinforcement is taken as 700 MPa.

E. Loads shown satisfy both Design Moment and Design Shear.

**STANDARD MASONRY SPECIFICATION**

- Mortar Joint: 10mm (3/8”)
- Height: 76mm (3”)
- Example Beam Depth: 4 courses above HeliBar is 339mm (13’’)
- Example: 3 HeliBars in Mortar Joint
- Clay Masonry Assumed Weight: 19kN/m³

**Website**

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