

# HELIFIX

SUSTAINABLE STRUCTURAL SOLUTIONS

## Structural Preparations for Window Replacement and External Wall Insulation Programmes



Approved installers available nationwide

# About Helifix

Helifix specialises in fully concealed non-disruptive structural repair and reinforcement systems. They provide reliable long term solutions for most commonly occurring structural faults and are used extensively during property maintenance and improvement programmes.

With over 30 years' experience, Helifix has considerable knowledge and technical expertise and prides itself on possessing the necessary in-house skills to undertake all aspects of any project including advice and support, on-site back-up and high quality designed repairs using innovative, sympathetic, concealed installation techniques.

Operating throughout the UK and in many parts of the world, Helifix products are highly regarded, independently tested, proven and widely used. They provide many outstanding benefits, from the simplicity of their design to their ease of installation and



long term performance. They combine the required strength with flexibility, durability and great holding power in all commonly used building materials to produce sustainable remedial solutions that greatly extend the life of existing structures.

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



## 1 Survey

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

## 2 Diagnosis

The exact cause of the problem is carefully diagnosed by an experienced engineer. This is essential in order to devise an appropriate solution.

## 3 Design & Specification

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

## 4 Tender

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

## 5 Installation

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

## 6 Guarantees

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

# Ensuring lintel security for window replacement

Before windows are replaced, it is essential to check the condition of the lintels to assess their structural stability.

If there are cracks running from a window's top corners, often at 45°, the likelihood is that the lintel has failed. Sometimes the lintel is simply weak and needs reinforcing to ensure there is no movement and in some cases there is no lintel at all and the masonry has simply been supported by the existing window frame. In this situation a new lintel must be installed or created.

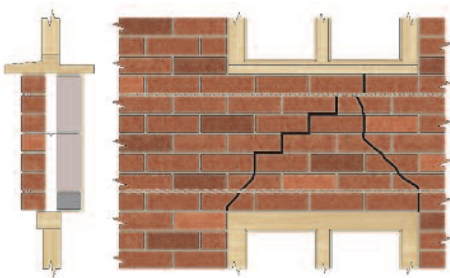
Traditionally, the brickwork above a window would be removed and a new concrete lintel or steel angle installed. This is time consuming, expensive and, with three new courses of brickwork,

visually unappealing. It is also extremely disruptive for the residents as it involves having mechanical props both internally and externally to support the masonry during lintel installation.

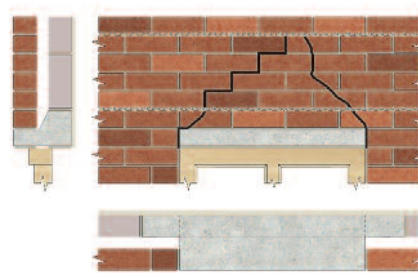
The Helifix Helibeam System overcomes all these difficulties by using the existing masonry. It is quick, simple, reliable, economical and non-disruptive. Mortar beds are channelled-out at two levels above each window and pairs of stainless steel HeliBars are bonded into the slots with HeliBond cementitious grout. A deep masonry beam is formed above the window which supports the masonry and spreads the structural loads. Generally, DryFix remedial ties or grouted CemTies are then installed vertically up through the brickwork and



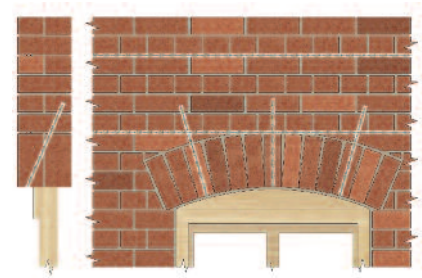
into the new masonry beam to secure the existing lintel. No mechanical supports are required and the existing window frame can be removed and replaced without fear of the masonry moving.



Creating lintels in a cavity wall



Overcoming rotating boot lintels



Reinstating failed brick arch lintels

# Meeting the load requirements of external insulation panels

Local authorities and social housing landlords are looking to improve the thermal insulation of their housing stocks to lower fuel consumption, costs and carbon emissions while meeting current



regulations and improving the living standards of their tenants. Where those homes are solid wall properties, prefabricated houses or precast concrete high rise buildings with narrow cavities, the use of rendered external insulation panels is popular and can improve the thermal U value of the walls by some 75%.

However, if the external elevations are unable to support the additional load of the new insulation and decorative finish due to weak, corroded or insufficient wall ties, these must be replaced or supplemented with new ties. If the inner skin or piers are constructed from clinker

blocks, concrete or dense material, secure wall tie installation can be very difficult and unreliable, particularly as engineers may specify pull-out loads larger than the usual 1kN to account for the additional loading.

Helifix one-piece, helical stainless steel remedial ties are able to satisfy these varied conditions and provide property owners with a rapid cost-effective solution. Frequently the DryFix tie is appropriate, which is rapidly installed using a special tool to power-drive the tie into both leaves via a small pilot hole, which is easily disguised. It requires no grouts, resins or mechanical expansion so can be load-tested immediately to establish its suitability. The requirements of the engineer, contractor and property owner are all satisfied, quickly and economically.

# Case Studies

## Window Replacement

### Runnymede Borough Council, Surrey



Following a window replacement programme four years earlier, these calcium silicate brick council houses were suffering from masonry shrinkage and cracking and sagging of the lintels above the windows.

The original plan was to undertake comprehensive re-pointing and install remedial movement joints plus a full lintel replacement programme. This would have involved the removal and

rebuild of all cracked brickwork and the installation of stainless steel angles above all windows. This option would have been very disruptive to occupants and the building fabric, leaving a visually undesirable result, and had an average anticipated cost of £20,000 per house.

The Helifix method required no taking down and rebuilding or steel lintels, was much quicker and caused minimal disruption. Furthermore, the average cost was £3,000 on 87 houses – a saving of nearly £1.5m. Indemnified warranties were provided to the client.



### London Borough of Haringey

At Trulock Court, a 10 storey 'Y' shaped residential tower block, the masonry above each opening was only supported by the existing load bearing metal windows and there was also a serious lack of wall ties.

The Helifix system avoided the difficulty and expense of using temporary mechanical supports and the installation of new concrete lintels. It was much quicker and more economical, enabling the window replacement and remedial wall tie programmes to be completed in just three weeks. Also, it had no effect on the building's appearance.



## Norwich City Council

Before beginning a major window replacement programme on numerous council properties, surveys indicated that masonry above the soldier course header bricks could move once the existing frames were removed, making installation of the new frames extremely difficult. Major failures had been experienced before commencing installation of the Helifix system from Helifix.

To ensure that this did not happen, and to avoid having to use disruptive and expensive mechanical supports, the council specified the Helifix system of lintel reinforcement.

Furthermore, it was cost-effective, caused minimal disruption and the work was covered by a Helifix warranty for the products and installation, undertaken by an Approved Installer, as well as third party insurance with the Consumer Protection Association.

## London Borough of Barnet

A number of 1930's council homes, due for replacement windows, had 45° cracks running from the window's top corners and were found to have no existing lintels. A rapid and reliable means of reinforcing the masonry was required to allow the programme to remain on schedule.

The Helifix system was chosen as it was fast, economical and non-disruptive, enabling all tenants to remain in their homes while the work was carried out.



## Sanctuary Housing, Scarborough

Many of these housing association properties, which were due for window replacement, had inadequate outer leaf support above the windows. Additional reinforcement was required to avoid any movement of the masonry above the openings once the existing window frames had been removed.

Using a combination of grouted HeliBars, DryFix and CemTies, new masonry beams were created over each window and the soldier course lintel brickwork secured into the beams above. Work was completed quickly and efficiently and the buildings left visually unaltered.

# Case Studies

## External Wall Insulation Cladding

### London Borough of Hammersmith & Fulham

Three 24 storey 1960's tower blocks had a major ecological upgrade involving the fitting of extensive insulation, external cladding and solar panels to improve energy efficiency and enhance their overall appearance.

The structures comprise a concrete frame, lightweight concrete block infill and a brick outer skin. Project engineers, Carter Clack, chose Helifix to undertake reinforcement of the calcium silicate brickwork in stairwells on all three blocks to ensure these areas were strong enough to take the weight of the external over-cladding system and render.

An innovative technique, involving interlocking 23,000 bonded ResiTies and 15,000m of HeliBars in the six stairwells, connected the inner leaf to the main structure and enabled the HeliBars to distribute the wall tie loads through the entire face of the outer leaf masonry, providing greater resistance to wind loadings. Once the stairwell masonry had been fully secured, connected and reinforced, the external cladding and rendering of the towers could proceed.



### RCT Homes, Penywaun, South Wales



Constructed with a clinker block internal skin, a concrete external skin and just a 50mm cavity, 170 properties owned by the largest social landlord in Wales were to be upgraded to meet current thermal insulation requirements.

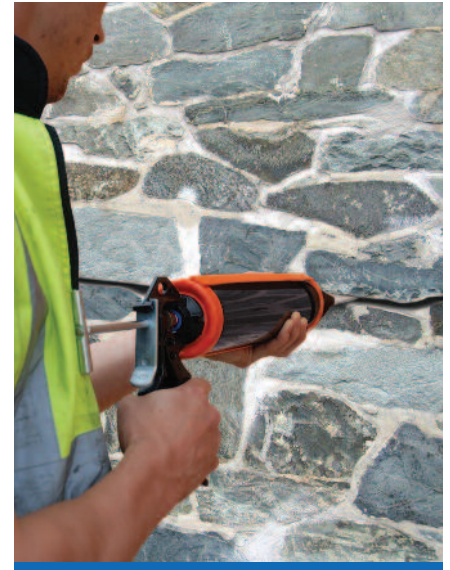
Engineers determined that the strength of the external walls needed increasing in order to bear the weight of the new external cladding system. They stated that the new wall ties must have an enhanced minimum pull-out of 1.6kN while the contractor wanted ties that could be rapidly and easily installed as the contract was on a tight timescale.

Following on-site testing, DryFix remedial ties were specified as they satisfied all the requirements. Installation was rapid and trouble-free and the project was able to remain on schedule.

# Helifix Masonry Repair Strategies

Helifix remedial products are extremely versatile and adaptable and have wide ranging applications. Successfully used to overcome most commonly occurring structural faults, they will reliably, economically and sympathetically restore

integrity to virtually every type of structure and have proven to be effective in most common construction materials including bricks, blocks, stone, timber, concrete and a variety of regional materials such as Cob and Wychert.



## Crack Stitching

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



## Lintel Repair & Creation

Where lintels have lost their load-bearing capabilities the traditional solution is to cut out the brickwork, mechanically support the masonry above and install a new lintel, Helifix systems, for lintel repair and creation using the existing masonry, are less disruptive, time consuming and expensive.



## Replacing Failed or Omitted Wall Ties

Wall tie failure is a major cause of masonry cracking and, if not addressed, can lead to catastrophic collapse of the outer masonry leaf. Helifix remedial wall ties, with rapid easy installation, provide a secure and reliable connection between the inner and outer leaves.



## Creating Load Bearing Masonry Beams

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



## Restraining Bowed External Walls

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



## Reconnecting Separated Walls

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



## 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.



## Stabilising Rubble-Filled Walls

As rubble-filled walls age the fill will often settle and the walls bulge outwards. To stabilise the wall fully grouted CemTies are installed to secure the inner and outer leaves.



## Bay Windows

Bay windows may crack and separate from the main structure due to foundation movement or because differing materials were used on the bay and the main house building. Helifix systems provide a concealed, non-disruptive means of securing the bay to the main structure.



## Securing Parapet Walls

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



## Creating Movement Joints

Where movement joints have been omitted and masonry cracking has resulted, Helifix has a simple cost-effective solution. HeliBars are installed across a vertically cut joint and bonded at one end with the other end allowed to move freely inside a bonded sleeve.

Over 100 standard repair details are available online, covering all common structural faults.

[www.helifix.co.uk/downloads](http://www.helifix.co.uk/downloads)



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