



SUSTAINABLE STRUCTURAL SOLUTIONS

Safe Installation Guide





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Risk Management

Safe work practices on construction sites requires risk management. A four part schema of risk management is as follows.

Identify and Assess Hazards

The maintenance of safe work practises requires the identification of hazards and assessment of the risks they pose.

Eliminate and Isolate Hazards

The elimination of hazards from the workplace is a desirable goal. Hazard isolation is a second best objective when elimination is not practicable.

Hazard Control

The development and implementation of strategies to control exposure to identified hazards is essential to risk minimisation.

Personal Protection

Personnel working with hazardous materials or equipment, or in hazardous work environments, must wear appropriate personal protective equipment at all times.

Acts and Regulation

Construction sites must be managed to the minimum standards required by national and local occupational health and safety acts and regulations. Relevant Australasian acts and codes of practice include:

- **Health and Safety at Work Act (HSWA) 2015**
- Hazardous Substances and New Organisms (HSNO) Act (1996)
- Work Health and Safety Act (2010)
- Hazardous Manual Tasks Code of Practice
- Construction Work Code of Practice
- Managing Noise and Preventing Hearing Loss at Work Code of Practice
- Managing Electrical Risks in the Workplace Code of Practice

Product information available at:
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and
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I. INTRODUCTION

Leviat is committed to helping site managers and users of Helifix products develop and maintain safe work practices and comply with occupational health and safety (OHS) provisions.

This guide addresses immediate hazards associated with the installation of Helifix ties and reinforcements, and is an expression of this commitment. Site managers and product users may choose to refer to the following notes when designing strategies to manage risks associated with the installation of Helifix products. Product information and detailed installation statements for all Helifix products are available in hard copy format from Helifix and for download from the Helifix website. Assistance may also be sought direct from Helifix.

Helifix installation procedures often require the use of power tools to either cut or drill holes into or through masonry-type substrates. Installation may also involve the use of cementitious or epoxy-based bonding agents. Accordingly, depending upon the system employed, installers may face any one or combination of the following hazards, which have been categorised into mechanical and electrical, physical, occupational noise, atmospheric and chemical.

2. MECHANICAL AND ELECTRICAL HAZARDS AND SAFETY PROCEDURES

Electricity, gas and water pose immediate and dangerous hazards to users of Helifix products. Installation procedures will regularly involve the use of power tools to cut slots into masonry, and to drill holes and drive stainless steel fixings into walls and through wall cavities which may contain live electrical, gas and/or water services.

Electrical accidents can result variously in nerve damage, burns and fatality. Accidents involving gas can result in explosions and respiratory hazards. Uncontrolled water spillage can pose a general safety hazard. Thus it is critical that appropriate measures are taken to identify, assess and eliminate or control the risk of installer electrocution or the puncturing of gas or water services.

Regulatory requirements and details for dealing with electrical, gas and water hazards on construction sites are addressed in New Zealand's **Health and Safety at Work Act (HSWA)**, the Australian **Model Work Health and Safety Act** and the associated national codes of practice. As a minimum, Helifix recommends that a number of steps be taken to identify, assess and control such risks.

- Wherever possible, electrical, gas and water services should be disconnected from their sources before any tie installation work begins.
- The presence and location of cabling and service pipes should be ascertained and their positions marked. An indication of service locations may be obtained from appropriate building plans and details, but a physical inspection should also be carried out prior to drilling. A number of proprietary tools are available that may assist with this process. Borescopes and endoscopes inserted through vents or inspection portals, or inspections conducted via the removal of wall portions or roofing should be used to provide visual confirmation of the presence and location of cabling and pipes.
- Appropriate personal protective equipment should be worn when drilling and when driving fixings into position. Insulated electrical safety gloves and appropriate quality safety footwear and eyewear should be worn. Insulated floor mats should also be used.
- Only tools in good condition and with good quality insulation should be used by installers. Tools and cabling should be tagged and checked regularly for faults. Faulty or dangerous tools and cabling should never be used.
- Careful and deliberate drilling procedures should be employed at all times. Careful and deliberate drilling will increase the opportunity for drill operators to recognise changes in the material condition of the walls into which they are drilling and whose internal characteristics cannot be seen but only detected through the feel of the drilling process itself. For example, when drilling into cavity walls, drill operators should cease drilling once they feel the drill bit break through the near leaf and enter the void. Operators should then gently push the drill bit across the cavity until it reaches the other side before attempting to restart the drill. A gentle and deliberate action such as this will help the operator detect the presence of any pipes or cabling running through the cavity which may not have been discovered during the inspection process and so provide a final safeguard against injury.

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3. PHYSICAL HAZARDS AND SAFETY PROCEDURES

Helifix remedial wall tie and reinforcement installation procedures are physical work activities that involve the handling of short, sharpened, stainless steel fixings and generally always involve the use of hand-held power tools. They are 'manual handling' tasks in the sense defined in the Australian *Hazardous Manual Tasks Code of Practice* and *Work Health and Safety Act*, and in New Zealand's *Health and Safety at Work Act* and associated *Code of Practice for Manual Handling*. Accordingly, a number of OHS issues involving the potential for tie installation to cause physical or musculoskeletal harm should be considered when organising tie or reinforcing installation projects.

Possible physical hazards involved with installation include:

- (a) hazards associated with lifting, moving and operating small power tools around building sites;
- (b) hazards associated with repetitive cutting or drilling actions;
- (c) hazards associated with maintaining cutting or drilling postures;
- (d) hazards associated with prolonged exposure to cutting or drilling vibrations; and
- (e) hazards associated with handling and installing sharpened stainless steel fixings.

The degree of hazard posed by repetitive wall tie installation procedures may depend upon the size of the project. For example, larger projects involving the installation of many thousands of remedial wall ties may involve a higher degree of musculoskeletal risk than smaller applications, since installers are likely to face increased exposure to factors like drilling vibration. Thus, safe installation strategies should be tailored to meet individual work site conditions.

Helifix recommends that a number of commonsense measures should be followed at all times to minimise the physical risks associated with power tool usage and Helifix tie installation.

- Appropriate personal protective equipment, including quality safety footwear, eyewear and headwear, should be worn when on site.
- Power tools should only ever be used in accordance with the manufacturer's instructions and in accordance with their intended use.
- Tools should be operated only in clean, stable, well-lit work places. Scaffolds, boom lifts, ladders and other platforms that enable installers to work at heights should only be used if properly secured and in safe working condition.
- Work places should be organised to ensure that tool operators do not have to lean, stretch or bend excessively during operation. Installers should not operate in positions that require power tools to be held and operated for prolonged periods above shoulder height or below waist level. Also, installers should only ever work from within a comfortable arms length from the wall or surface into which the ties are to be installed.
- Only quality, light-weight power drilling tools should be used when cutting or drilling, or when driving ties into position. Quality power tools can be expected to offer great control over important operational factors like speed and direction, and offer enhanced electrical and physical impact/vibration insulation.
- Installation rosters should be organised to allow regular installer breaks from cutting, drilling and tie installation.
- Helifix ties should be handled with care during installation and when moving them around site. Care should also be taken to ensure that, once installed, no sharp edges or tie ends are left exposed. In most instances, Helifix installation procedures will require each installed tie to sit fully within the masonry under repair; such that tie exposure should not be an issue. In some instances, however, installation may involve allowing portions of the tie to remain exposed while other works are carried out. This may be the case when using the StarTie system, for example. In these cases, an appropriate physical barrier (e.g. hard plastic casing) should be used or erected to shield installers and other site personnel or visitors from the exposed, sharpened tie ends.



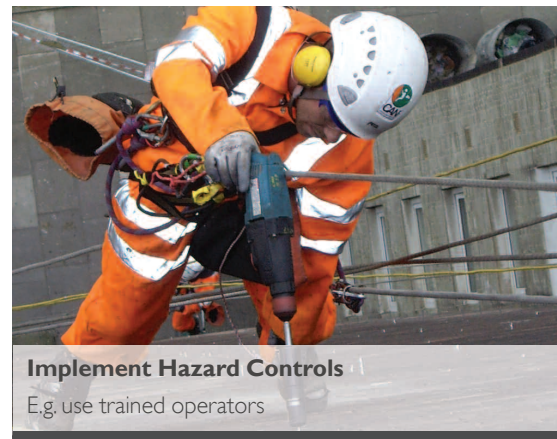
Identify and Assess Hazards

E.g. Inspect cavities for presence of services



Eliminate and Isolate Hazards

E.g. Disconnect or remove services from wall cavities



Implement Hazard Controls

E.g. use trained operators



Personal Protection

Wear personal protective equipment

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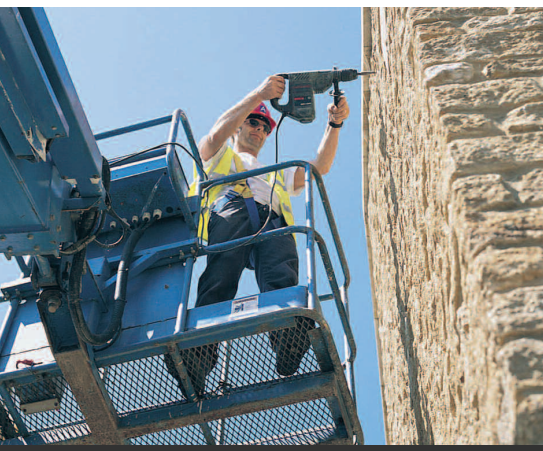


4. OCCUPATIONAL NOISE HAZARDS AND SAFETY PROCEDURES

Helifix tie installation will generally always involve the use of power drilling tools and may require installers to work in enclosed spaces where echoes and noise amplification may pose an occupational hazard. Details on acceptable occupational noise levels and guidelines for dealing with noise are presented in the *Occupational Noise Management Standard* [AS/NZS:1269 (2005)] and the associated codes of practice. Generally, OHS provisions demand that occupational noise not exceed an 8-hour noise level equivalent of 85dB or peak at more than 140dB.

Prolonged exposure to loud noise can lead to noise-induced hearing loss and/or tinnitus (ringing in the ears). As a minimum, Helifix recommends that the following steps be undertaken to address the occupational noise hazards that may be associated with tie installation.

- Exposure to noise should be limited wherever possible.
- Installers should wear appropriate hearing protectors (e.g. earmuffs) whenever operating power tools.
- Quality power drilling tools that offer improved sound dampening technologies should be used wherever possible.



5. DUST / ATMOSPHERIC HAZARDS AND SAFETY PROCEDURES

Drilling into masonry products is likely to lead to the generation of drilling dust and airborne substances, some of which may pose an occupational hazard. Similarly, handling dry construction powders and mixing bonding agents may entail the release of potentially harmful airborne substances. Details and guidelines for identifying, assessing and controlling the risks associated with atmospheric contaminants are presented in the Australian *Hazardous Substances Information System* (HSIS). In New Zealand, requirements for the control of airborne contaminants and hazards are covered by the *Health and Safety at Work Act*.

Exposure to dust and atmospheric contaminants can cause or exacerbate respiratory problems with the extent of possible problems influenced by several factors, including: the type of dust or contaminant, particle size, duration of exposure and the part of the respiratory system exposed to the hazard (e.g. mouth, nose, lungs). Thus it is important that appropriate measures be taken to identify, assess and eliminate or control the risk of installer exposure to dust and atmospheric contaminants. As a minimum, Helifix recommends that the following steps be undertaken when drilling, mixing bonding agents and installing ties.

- Installers should wear appropriate face and air filtration masks whenever operating power tools or working with powders or chemicals.
- Power tools should only ever be used in accordance with the manufacturer's instructions and in accordance with their intended use.
- Wherever possible, power tools should be fitted with appropriate dust extraction and collection accessories.
- Work environments should be well-ventilated. Electric and mechanical dust extraction and air filtering devices should also be used wherever possible.
- Work sites should be cleaned regularly to prevent dust build up.



6. CHEMICAL HAZARDS AND SAFETY PROCEDURES

Some Helifix remedial wall and pinning tie systems require the use of chemical bonding agents. The CemTie system employs a proprietary Helifix cementitious-based bonding agent, for example, and the ResiTie, RetroTie and BowTie systems rely upon the performance of epoxy resins. Some of these agents may be hazardous and cause harm should they come into contact with eyes or skin, or if they are swallowed or inhaled.

Details and guidelines for identifying, assessing and controlling the risks associated with the use of hazardous substances are covered by and include New Zealand's *Hazardous Substances and New Organisms (HSNO) Act* (1996) and the Australian *Managing Risks of Hazardous Chemicals in the Workplace Code of Practice*.

In accord with the act and codes of practice, safety data sheets (SDS) are available for all Helifix construction chemicals. All products are also labelled in accord with the codes of practice. Health and safety information and procedures are presented in the SDS and in summary form on product labels. The procedures outlined in the SDS for each product should be followed at all times. Helifix also recommends that the following minimum precautionary measures be followed whenever dealing with chemicals.

- Exposure to hazardous substances should be limited wherever possible.
- Chemicals and construction materials should only ever be used in accordance with the manufacturer's instructions and in accordance with their intended use.
- Appropriate personal protective equipment, including quality safety gloves, face masks and eyewear, should be worn when handling hazardous materials.
- Contact with eyes and skin should be avoided. Eyes should be rinsed immediately with plenty of water and medical advice sought in cases of contact. Water may also be used to clean cement-based materials and epoxy resin from skin. Solvent may be preferred if required to clean epoxy resin from skin. Denatured alcohol, mineral spirits or acetone, for example, may be used for this purpose. Note that solvents may pose a safety hazard of their own. Some may be more flammable than others, and others may pose a respiratory hazard.
- Work environments in which hazardous substances are to be used should be contained and ventilated as appropriate.

Safety data sheets available at:
www.helifix.com.au
and
www.helifix.co.nz





BowTie

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

CemTie

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



DryFix

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

HeliBar

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



PatchPin

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

ResiTie

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



RetroTie

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

StarTie

StarTie is a wall tie for new build cavity and veneer construction. StarTies are quick and easy to install and engineered from austenitic stainless steel Grade 316 as standard.

HeliBond

Injectable, non-shrink cementitious grout

CrackBond TE

Pure epoxy anchoring mortar

EpoxyPlus TE

Pure epoxy anchoring mortar

EpoxyPlus EX

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



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