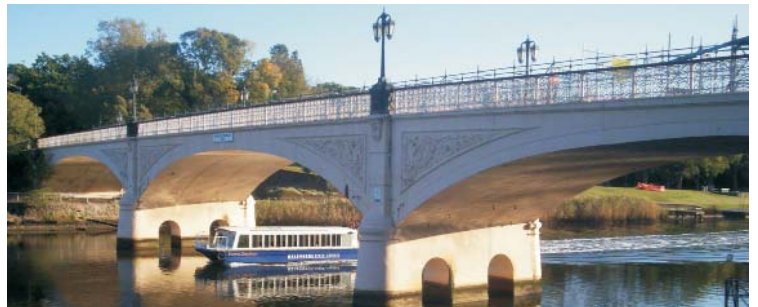




Solutions
Foreva

HERITAGE STRUCTURES

REPAIR, PROTECTION
AND STRENGTHENING



I M P R O V E , P R E S E R V E , S E C U R E



FREYSSINET
SUSTAINABLE TECHNOLOGY

THE PROBLEMS

Whether constructed in timber, stone, brickwork or concrete, a building undergoes changes over the course of time. Freyssinet offers proven solutions for the repair, reinforcement and protection of these structures.

■ AREAS OF APPLICATION

- Any building with stability problems or in need of repair or reinforcement.

■ PROBLEMS IDENTIFIED

- Cracks, excessive deformation, partial destruction or breaking of elements
- Timber: rot, peeling, splitting, cavities, missing sections, broken joints
- Glued-laminated timber: rot, peeling, undersized sections
- Masonry: repointing required, dislodged elements, instability, missing mortar or blocks
- Reinforced concrete: corrosion of reinforcements, flaking, spalling, leaching, peeling

■ NATURAL CAUSES

- Aging of materials, chemical attack
- Timber: excessive humidity, decay caused by insects, sun damage (UV)
- Masonry: shifts in soil structure, inadequate stress distribution, leaching of masonry
- Concrete: chloride attack, carbonation, water infiltration

■ STRUCTURAL CAUSES

- Change of use, changes in standards
- Design error, poor design or construction
- Material fatigue
- Shifts in masonry structure

■ OTHER CAUSES

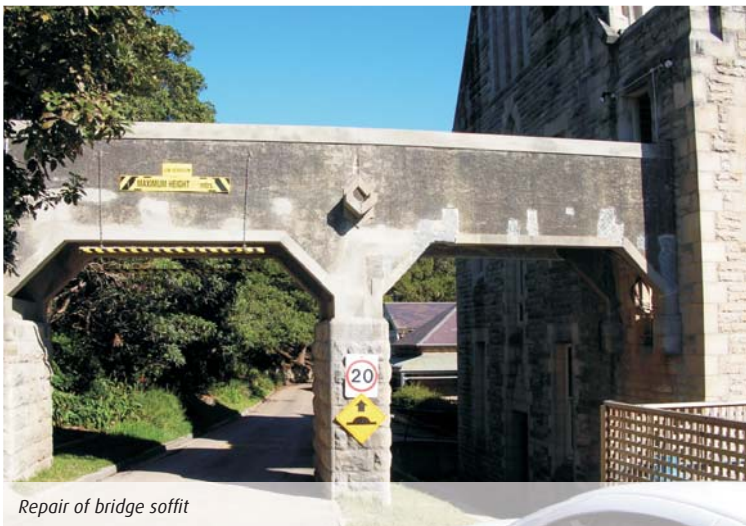
- Variable loads
- Ground movements
- Fire
- Earthquake



Repair of curved vaulted timber frame tie beams



New infill concrete slab



Repair of bridge soffit



Spalled concrete, corroded steel and carbonation

Freyssinet, with more than sixty years of experience, as a main contractor in specialised works, has developed the Foreva® solution, a turnkey service guarantee for the long-term enhancement of your structures.

OUR SOLUTIONS

Foreva® solutions enable Freyssinet to carry out rehabilitation work in line with industry standards and good practice while respecting the environment.

■ FEASIBILITY STUDY

■ EXECUTION METHODS

■ WORKS

Repair and reinforcement of timber structures

- Repair of cracked or broken sections using a seaming technique
- Restoration of peeling glued-laminated timber using a remeshing technique
- Repair of timber frame supports using strength joints
- Repair of structural beams using tying techniques
- Reconstructing timber framed walls and structural members
- Beam reinforcement by connection of a polymer concrete compression flange
- Beam reinforcement by connection of a mounted timber foundation plate
- Reinforcement of zones subject to tensile forces using bonded carbon fibre composite (**Foreva® Wood Fabric**)
- Increasing the bearing capacity of a floor by laying a self supporting floor plate
- Additional post-tensioning (Freyssinet System)

Repair and reinforcement of brickwork and stone buildings

- Wall tying using composite glass or carbon fibre rods (**Foreva® Stone RFG** and **Foreva® Stone RFC**)
- Repointing masonry
- Surface treatment, remineralisation
- Bracing masonry arches with composite reinforcement
- Restoring the thrust lines in arches (Freyssinet Flat Jack)
- Surface post-tensioning (Freyssinet System)

Repair and reinforcement of concrete structures

- Realkalisation of coatings by electrochemical repair (**Foreva® PH⁺**)
- Chloride extraction work on coatings by electrochemical repair (**Foreva® Cl⁻**)
- Crack grouting
- Surface treatment



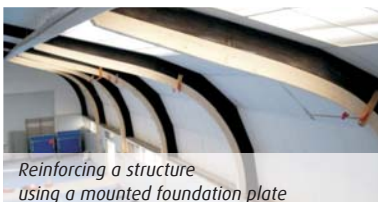
Figure repair



New masonry works for installation



Wall tying using composite rods



Reinforcing a structure using a mounted foundation plate



Floor reinforcement with compression flange



Reconstituted and treated concrete

Our specialist teams are on hand to help you identify the Foreva® solution to meet your requirements.



1



2



3



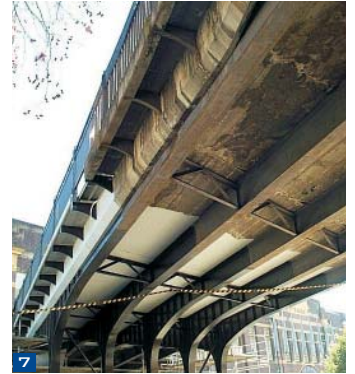
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1/Building repair 2/Coatings 3/Cathodic protection 4/Floor slab replacement 5/Masonry replacement 6/Chimney replacement 7/Bridge repair

SYDNEY

Level 3, 13-15 Lyonpark Road
Macquarie Park NSW 2113
Tel: +61 2 9491 7177

MELBOURNE

217 Arden Street
North Melbourne VIC 3051
Tel: +61 3 9321 1300

BRISBANE

6 Chapman Place
Eagle Farm QLD 4009
Tel: +61 7 3862 0100

PERTH

115 Radium Street
Welshpool WA 6106
Tel: +61 8 9251 1030

NEWCASTLE

271 Brunner Road
Adamstown NSW 2289
Tel: +61 2 4978 7806

CHRISTCHURCH

1220 Main North Road
Christchurch 8083 New Zealand
Tel: +64 3 903 2362



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SUSTAINABLE TECHNOLOGY

www.freyssinet.com.au

www.freyssinet.co.nz