



Solutions
Foreva

BUILDINGS
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 concrete, metal, masonry or wood, bridges age and undergo changes over the course of time. Freyssinet offers its clients proven solutions for the repair, the protection and the strengthening of these structures.

■ AREAS OF APPLICATION

- Industrial or residential buildings;
- Office buildings;
- Communal facilities;
- Shopping centres;
- Car parks;
- Historic monuments.

■ IDENTIFIED PROBLEMS

- Corrosion of reinforcing steel,
- Concrete spalling and flaking,
- Concrete cracking,
- Concrete delamination,
- Partial destruction or breaking of elements,
- Excessive deformation.

■ NATURAL CAUSES

- Ageing of materials (steel, wood, concrete);
- Concrete cracking or spalling due to alkaline reaction;
- Concrete carbonation;
- Chloride penetration in the concrete coating;
- Chemical attacks;
- Freeze/thaw cycles.

■ STRUCTURAL CAUSES

- Change of use (increase in live loads, creation of openings);
- Regulatory change (earthquake, wind);
- Calculation error, poor design or implementation;
- Material fatigue, effects of rolling loads.

■ ACCIDENTAL CAUSES

- Fire;
- Excessive loads;
- Ground movements;
- Vibrations



Slab strengthening with additional prestressing



Floor strengthening with Foreva®TFC



Strengthening of wood structure



Balcony strengthening with additional prestressing

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

Shotcrete strengthening



OUR SOLUTIONS

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

■ ASSISTANCE WITH THE STRUCTURAL DIAGNOSIS

■ ASSISTANCE WITH THE DESIGN

■ PROTECTION EXPERTISE

Concrete repair and protection

- Treatment of cracks
 - Resin and grout injection (**Foreva® TF Inject**)
 - Injection of cracks with water infiltration (**Foreva® TF Epigel**)
- Concrete re-profiling
 - Resurfacing (**Foreva® REP**)
 - Shotcrete (**Foreva® Shotcrete**)

Protection of reinforcing steel

- Cathodic protection with galvanic anode:
 - Discrete (**Foreva® GP Guard***)
 - Sprayed zinc coating (**Foreva® GP Zinc**)
- Cathodic protection with impressed current:
 - Discreet anodes (**Foreva® CP Tube**)
 - Anodic ribbons (**Foreva® CP Ribbon**)
 - Anodic meshes (**Foreva® CP Mesh**)
 - Conductive anodic coating (**Foreva® CP Coat**)
- Electro-chemical concrete repair
 - Realkalinization (**Foreva® PH***)
 - Chlorides extraction (**Foreva® CL-**)
- Surface Treatment
 - Physical and chemical treatment with corrosion inhibitor (**Foreva® Inhib**)
 - Protective coatings (**Foreva® Relastic 300 and Foreva® Fuge 500**)

Underpinning with micropiles



Underpinning with Fondapieu



■ STRENGTHENING EXPERTISE

- Additional prestressing (Freyssinet products)
- Shotcrete (**Foreva® Shotcrete**)
- Carbon fiber bonded composite
 - High modulus fabric (**Foreva® TFC**)
 - Pultruded laminate (**Foreva® LFC**)
 - Pultruded rod (**Foreva® RFC**)
- Metal and wood reinforcements
- Underpinning with micro-piles
- Load transfer using flat jacks (Freyssinet process)

Treatment of concrete strengthening with cathodic protection



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



MAIN OFFICE

44880 Falcon Place, Suite 100
Sterling, VA, 20166
Phone: (703) 378-2500 - Fax: (703) 378-2700
freyssinet@freyssinetusa.com

MIDWEST REGIONAL OFFICE

1444 Farnsworth Ave, Suite 505
Aurora, IL 60505
Phone: (630) 820-6070 - Fax: (630) 898-3336
freyssinet@freyssinetusa.com

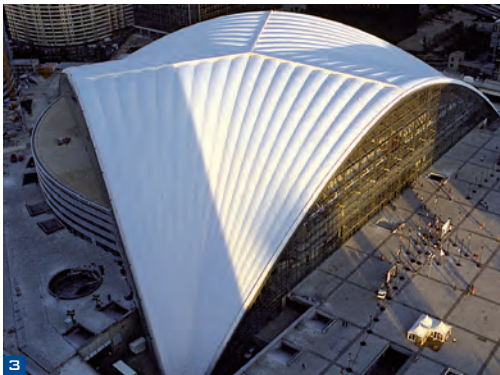
SOUTHEAST REGIONAL OFFICE

990-C Norcross Industrial Court
Norcross, GA 30071
Phone: (678) 291-9750 - Fax: (678) 291-9757
freyssinet@freyssinetusa.com



FREYSSINET CANADA LIMITÉE

8200 Decarie Boulevard, Bureau 200
Montreal, Canada H4P2P5
Phone: (514) 739-1110 - Fax: (514) 739-0503
freyssinet@freyssinet.ca



1/Louvre Museum, Paris 2/Building on Jeanne d'Arc street, Paris 3/CNIT congress-exhibition centre, Paris La Défense 4/Museum of Contemporary Art, Toulouse 5/Thermal baths, Nancy



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