

■ Bridges



Replacement of suspension cables



THE PROBLEMS

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

■ FIELD OF APPLICATION

- Roadway bridges;
- Railway bridges;
- Canal bridges;
- Pedestrian bridges.

■ IDENTIFIED PROBLEMS

- Corrosion of steel elements;
- Concrete spalling and flaking;
- Concrete cracking;
- Concrete delamination;
- Partial destruction or failure of elements;
- Excessive deformation;
- Water infiltration;
- Water leaks and infiltrations.

■ NATURAL CAUSES

- Ageing of materials (steel, wood, concrete);
- Concrete cracking or spalling due to alkaline reaction;
- Concrete carbonation;
- Chloride penetration in the concrete cover;
- Chemical aggressions (polluted air, acid rain);
- Freezing/thawing cycles.

■ STRUCTURAL CAUSES

- Change of use (increase of live loads);
- Regulatory change (earthquake, wind);
- Design error, poor design or implementation;
- Material fatigue due to the wheel loads;
- Differential thermal expansion;
- Excessive creep;
- Excessive shrinkage and differential shrinkage;
- Missing expansion joints.

■ ACCIDENTAL CAUSES

- Fire;
- Excessive loading;
- Ground movements;
- Vibrations.



Slab reinforcement with prestressing bars



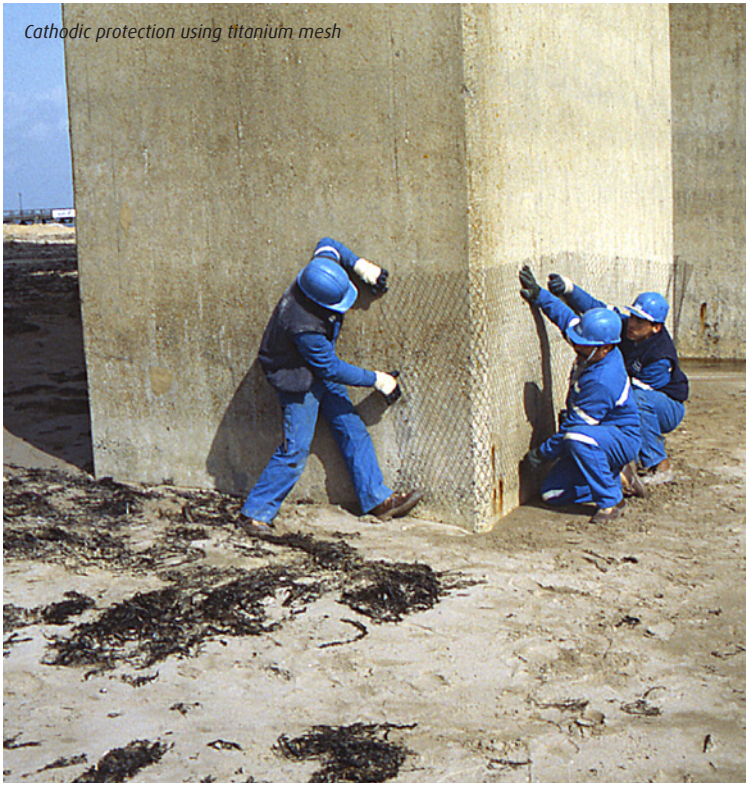
Reinforcement of underside of deck with Foreva®TFC



Zinc coating cathodic protection

Foreva Concrete Repairs offers a turnkey service guarantee for the long-term enhancement of your structures.

Cathodic protection using titanium mesh



OUR SOLUTIONS

Foreva® solutions enable repair and retrofit works in line with industry standards and good engineering practice

■ ASSISTANCE WITH THE STRUCTURAL DIAGNOSIS

■ ASSISTANCE WITH THE DESIGN

■ CONCRETE REPAIR

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

■ PROTECTION OF REINFORCING STEELS

- Cathodic protection with galvanic anode:
 - Use of discrete anodes (**Foreva® GP Guard**)
 - Use of zinc coating (**Foreva® GP Zinc**)
- Cathodic protection with impressed current:
 - Use of discrete anodes (**Foreva® CP Tube**)
 - Use of anodic ribbons (**Foreva® CP Ribbon**)
 - Use of anodic meshes (**Foreva® CP Mesh**)
 - Use of conductive anodic coating (**Foreva® CP Coat**)
- Electro-chemical treatment of concrete
 - Realkalinization (**Foreva® PH+**)
 - Chlorides extraction (**Foreva® CL**)
- Surface Treatment
 - Use of Inhibitors of corrosion (**Foreva® Inhib**)
 - Protective coatings (**Foreva® Relastic 310**)
 - Water repellent impregnation (**Foreva® Fuge**)

■ STRENGTHENING WORKS

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

■ PROTECTIVE COATINGS AND WATERPROOFING LININGS

- Polyurea spray coatings (**Foreva® Polyurea**)

Pier reinforcement with shotcreting



Jacking of bridges



Replacement of expansion joints



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



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