

## Martech dives into swimming pool repairs

Martech last year successfully tendered for the investigation of extensive reinforcement corrosion issues with subterranean swimming pool service ducts, at a sports centre in South Wales.

A detailed investigation found extensive corrosion damage in two parallel concrete service ducts, accessed through manholes in the pool surround. One of which was a balancing tank often full of pool water.

Martech's in-house confined spaces trained engineers carried out two visits to

fully investigate the extent of reinforcement corrosion in this concrete construction.

It was found that both had different corrosion issues, with the various nuances involved in looking at concrete subject to extensive chloride attack, both in an often saturated and in a rundown situation.

Martech has provided outline corrosion control and concrete repair advice with final findings, together with recommendations of concrete repair contractors for the eventual works.



## Hanging around with Martech



Martech's team of abseil-trained engineers can often be found hanging around tall buildings in their never-ending search for defective concrete.

Whether you have structural problems at a great height or in a confined space, Martech has the solution.



## Did you notice?

Martech has produced a whole newsletter - an annual event - without one story about their core concrete and external fabric condition assessment work! Martech has also erected emergency safety netting to badly deteriorated concrete in this last year, but clearly that too failed to capture their imagination...

Martech is not entirely sure how this oversight has occurred, but luckily the team know who to blame.

Now, where's Roel...

## Ongoing term contracts

Martech is in ongoing term contracts to carry out condition assessments on concrete housing stock, and also carries out routine condition surveys/MOTs on the multi-storey car park stock for a number of clients on a rotational basis across their various structures.

This is essential forward-thinking and proactive work in long-term maintenance, being particularly crucial on multi-storey car park stock. These structures can often suffer from extensive reinforcement corrosion issues, and require careful detailed specialist maintenance.



# The Inspector

Inspection and Testing News from Martech

Spring/Summer 2015

## MARTECH REPAIR FOR LANDMARK BRIDGE

Martech repair solution saves delicate structure for future generations



Martech stepped in to provide consultancy and repair solutions on a slender early-1950s arched footbridge giving access to the boat house island at a leading university.

Martech's early work, in conjunction with the university's consulting engineers, involved contemplation of earlier studies which recommended the demolition and replacement of the structure. Neither the consulting engineers - highly knowledgeable in conservation - nor the very experienced senior staff at Martech felt that this course of action was appropriate for this landmark structure, said to possibly be the earliest use of post tensioning in the UK. The university was also against replacement, hence their engagement with their current consultants.

The problem was severe, unrepairable corrosion of the post tensioning in the structure. This had resulted in the complete loss of all tensioning wires through corrosion in several places, and extensive decay elsewhere. The structure was originally built from a series of interlinked, tapered precast

concrete sections (rectangular inverted boxes), stabilised by post tensioning into the arch form, with a reinforced concrete topping over.

The innovative repair solution arrived at by Martech Technical Services, working in conjunction with the structural consultants, employed corrosion mitigation techniques including Margel corrosion inhibitor. These were applied both on the redundant post tensioning strands and on the cage around these. Following concrete repairs to the original, the formation of a strong yet slender reinforced concrete arch structure under the bridge stabilised the precast segments and acted as new structural concrete. The voids in the sections were filled with polystyrene, leaving small inverted voids for the new slab to key, thus adding directional stability to the existing main structure.

The completed and newly waterproofed structure looks fresh and retains its original slender profile through careful sympathetic and innovative concrete repair design solutions.

Martech's largest-ever ICCP project



Martech has just concluded its largest ICCP (impressed current cathodic protection) installation to date at a significant steel-framed property in a prestigious area of central London.

Martech has been involved on the project for a number of years, originally with the removal of a loose cracked/spalled lump of concrete that revealed the corroded steel frame. A further survey soon revealed widespread cracking of masonry due to corrosion.

The system has a state-of-the-art remote control system, which can be monitored and controlled from Martech's offices, linked to the central control unit via GSM link.

### Did you know?

Martech reaches the age of 25 years old as a business in July 2015.

This is a proud milestone, especially for several long-serving members of the team who have aged gracefully with Martech!

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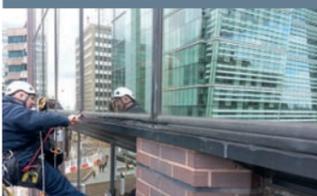
## A watertight abseil case for Martech



Martech has regularly consulted on water ingress on a modern curtain wall glazed office building in a Midlands city - something they do for a number of clients all over the UK.

Initial site works involved detailed inspections of all façades, with a particular focus on known areas of leakage. These were carefully marked and flagged up from inside in liaison with tenants, for Martech abseil engineers to investigate externally. A number of controlled water ingress tests were conducted to confirm findings and interpretation of shortcomings in the design and construction of the office buildings.

Given a history of failed repairs to the external fabric, Martech proposed holding repairs for the numerous defects. These detail modifications and remedial sealants, were successfully completed by Martech's abseil engineers and have successfully eradicated the problems.



## Martech repair success for 'written-off' crash stairs

An accident-damaged staircase is saved by Martech's repair strategy.

This external staircase became the final resting place for an out-of-control car, suffering significant damage in the impact.

Martech came to the rescue when endless discussions between insurers and contractors failed to reach a settlement and put forward a scheme that repair of the precast concrete structure and the hand railing was perfectly possible.

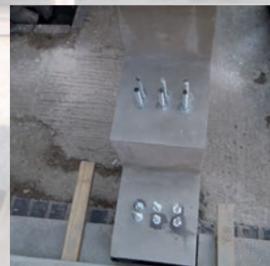
Works completed by the Martech Technical Services team involved the dismantling of the lower treads complete;

extensive concrete repairs with new tread anchorages to the spine beam; localised concrete repairs to match on three tread units, plus a complete replica tread made by hand to replace one beyond repair.

The work was completed by reassembly and coatings in situ, to include the carefully repaired and straightened hand railings

The Martech Technical Services team is always available to conclude specialist works and always appreciate a challenge away from our routine inspection and testing sub-consultancy works.

Incidentally, the car was beyond repair...



## Critical risk to hospital oxygen supply stabilised

Extensive cryogenic failure to a structural concrete slab, investigated by Martech.

Martech has undertaken concrete investigations on a concrete slab in the liquid oxygen delivery area of a well-known English city hospital. The investigations showed extensive concrete failure on the tanker delivery slab adjacent to oxygen storage tanks, as well as the tank base itself.

It was clear to Martech that they were likely to be dealing with a cryogenic failure mechanism, and their concrete investigation proposals included both in situ examination and exploration, plus cores for laboratory examination - including petrographic analyses. The tanker delivery apron had suffered deep and permanent damage, largely in the form of exaggerated freezing thaw damage that completely disrupted the matrix of the structural slab.

Martech provided remedial advice involving very specialist concrete mixtures, and the urgent remedial works will have to be carefully planned and implemented so as to avoid any disruption to operations in the hospital.



## Martech surveys cosmetic failings in ageing bridge



Martech has recently consulted on a concrete condition investigation and repairs project on an unsafe road viaduct. The client in South Wales had previously engaged Martech over many years during the investigation and condition monitoring of another large viaduct, which was successfully repaired and refurbished last year incorporating a Martech Technical Services designed ICCP corrosion control system.

The main concern on this viaduct, spanning two local roads, a river and a railway, was the poor condition of the parapet facing panels. These were of an ill-considered and poorly executed early 1980s design, and had not aged well. Martech also did some concrete condition survey works on the piers and cross heads of the structure, to confirm their visually sound concrete condition.

On-site testing revealed the parapet edge panels to be in such poor condition with danger of falling concrete, that immediate safety works were implemented with a road closure below in order to remove the failed concrete. Martech were at this stage asked to extend their involvement by providing an outline design for the replacement of the edge beam detailing.

Once the refurbishment and concrete repair works had been tendered, Martech were also retained as the client's concrete repair consultant, making weekly visits throughout the duration of the works by the selected concrete repair contractor.

The completed structure (shown below) looks simple and slender, through careful and aesthetically-sympathetic concrete repair design solutions. Once this concrete has aged for a few years little evidence of these extensive repairs will remain obvious.



## WW2 dome project scoops two heritage awards



The team at Martech was very pleased to hear that the WW2 Dome project concluded over a year ago, and featured on the front of our last newsletter, has since been the subject of two conservation awards: the Graham Allen Award for Conservation and Design; and the English Heritage Angel Award.

Martech Technical Services designed and installed a comprehensive ICCP system for the long-term corrosion protection of the structure and were delighted to hear from the client that in the case of English Heritage "a particular reference was made to the quality of the repair and conservation works".

