

Confined space inspections

Martech was engaged by a firm of consulting engineers for whom we frequently act as sub-consultants, in order to assess the reinforcement on a drainage chamber slab that was to be incorporated into a road on a new development. There was some question over the exact reinforcement that had been incorporated within what was a one-off variation on the standard design.

Martech attended site with a three-man confined space trained team in order to access the chamber and carry out the necessary investigation works. It was required to state bar types, covers and spacings for the Structural Engineer retained by the house builder developing the estate.

The works were reported upon in a brief letter report with photos and survey sheets to enable the engineer to do his design checks.



Did you notice?

Martech has evolved abseil access expertise over the years to enable easy access in other difficult areas, such as the high level gardening reported upon in previous years for a London client. In the last year we have also worked on tall reservoir structures over water and assisted with cost-effective concrete repairs on a pipe bridge over a river via safety lines. As reported elsewhere in this issue, this was quickly, safely and easily set up by our very experienced engineers.

On the ball with Martech

Working together with an installer of broadcasting equipment, Martech attended a well-known London stadium several times last year to carry out detailed covermeter surveys.

Our surveys ensured that the concrete surfaces could be drilled for fixings without affecting the reinforcing steel present and also reported on reinforcing bar locations in terms of loadings on the concrete concerned.

The out-of-hours work was concluded satisfactorily on every occasion.



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The Inspector

Inspection and Testing News from Martech

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COLD WAR CORROSION

Martech helps preserve 1950s nuclear bomb stores at RAF Barnham

Did you know?

All three of Martech's Senior Engineers have now been with us for over 20 years each, a fine achievement on their part. Our Operations Director is not far off 25 years of continuous service with us, and our Office Manager 15 years.

We are very lucky as a company to have such long serving staff, as the knowledge base is fantastic.

Martech has worked in various capacities over several years on the former RAF Barnham site (Barnham 94MU; now Gorse Industrial Estate) in East Anglia. This is a Cold War site that had a relatively short life in RAF terms. It was built in the early 1950s in connection with the nuclear weapons programme, and operated until 1963.

The site was built to store and assemble the huge free-fall atomic bombs such as the Blue Danube and the smaller Red Beard, both of which were maintained at Barnham. The nuclear weapons were carried by the purpose-built V bombers, often the Vickers Valiant, but were superseded by long-range missiles in the 1960s.

The site had three large bomb stores with bomb handling gantries (two remain today) together with a bomb maintenance and assembly facility (AKA Building 58), plus numerous outlying sheds or kiosks built to house the fissile plutonium weapon cores in lined and lidded stainless steel containers sunk into the ground. Water ponds existed for firefighting purposes plus a number of admin buildings, all surrounded by a substantial tall inner concrete post and panel fence, plus a chain link wire outer fence, all looked over by a number of elevated guard post towers.

These former nuclear bomb storage and handling facilities are today operating as an industrial estate in private ownership, and are designated as a scheduled monument by English Heritage. Several buildings on the site have listed building status and have recently been restored.

Martech has been involved in an advisory capacity with the owners and their consultants over many years, by way of concrete condition surveys, concrete repair advice and assistance with the development and execution of a concrete repair process designed to restore as well as preserve the main reinforced concrete structures.

The main structures were suffering hugely from reinforcement corrosion, both carbonation and chloride induced, with the proprietary system concrete repairs being enhanced by the blanket use of Margel corrosion inhibitors and elastic anticarbonation coatings. Historic England has been heavily involved in the restoration process working with the owner, the architect and Martech. The choice of finishes was designed to preserve the board finishes and original operational appearance and colours of the buildings but with significantly enhanced – and sorely needed – additional reinforced concrete protection to ensure preservation of the structures for future generations.



Cladding repairs in Cardiff



Martech was engaged by the managing agents of a prestigious office building in Cardiff, in order to assist with a replacement cladding panel to the front elevation.

Martech had already carried out a detailed cladding condition survey a couple of years back, on what is a fairly recent design and build construction with some faults.

Martech was able to arrange fabrication of a replica panel in the required colour, and then to install this on site for the owners.

We simultaneously helped with a few temporary mastic repairs in areas of known water ingress.



Reservoir gods



Martech was engaged by a leading water company's Consultant Engineers in order to carry out very detailed concrete testing to a specific brief on a remote reservoir in the Welsh mountains. Martech successfully tendered for the very extensive and complicated testing regime, also involving challenging access over water on various concrete structures. Some of the concrete laboratory tests will run over a year or more.

Martech engineers worked on site for a number of weeks on the site sampling and measurement works. The work is being reported upon in phases on this large scheme.



Reporting on a Span building

Following a recommendation, Martech was invited to report on an iconic modern Span building, dating back to the late 1950s. Span set out to produce very modern open-plan dwellings for middle-class families at a time when this was very much out of the ordinary. This nice block of flats in an outer London borough is an excellent, early example in a lovely setting, and is now Grade II listed.



Preserving an early concrete explosives facility



Martech has been working with a well-known firm of heritage architects, with whom we have a two decade working relationship, to assist with the detailed inspection and testing of an innovative concrete industrial building in the Greater London area. We had previously worked on this site in the 1990s.

Martech initially carried out a detailed condition assessment of the heavily-corroded fabric to enable pragmatic repair advice for the structure (built 1935-37), in additional discussion with Historic England. The concrete and condition assessment was reported to our usual high standards with the later requirements for further works tendered.

These involved the over-roofing of the structure in tarpaulin sheeting as a temporary measure as well as the development of a compromised repair

methodology for the façades.

This is a steel-framed structure with the frame wrapped on EML and rendered over. A lightweight RC roof and wall panels formed with decorative render on Hy-Rib sheet feature. In the event of an accidental explosion at this purpose-built cordite drying facility, the front walls and roof would be blown outwards to save the rest of the building.

The trial repairs focused on a single bay and involved new render plus decorative render finishes (as required), over replacement steel frame members with corrosion-resistant finishes. A lot of care was taken to try and produce a similar decorative facing mix. After a number of samples were tried, the final choice was a crushed grey granite and white cement mix, marginally tinted with OPC in order to match the existing weathered finishes.

The bay was finished with gentle power cleaning (deliberately intended to leave some industrial patina), application of corrosion inhibitors, and finally by clear decorative protective coatings.



View from a bridge

Martech had originally carried out a detailed concrete condition survey on an East Anglian Fens pipe bridge based upon a concrete load carrying structure. The survey had identified a number of concrete repairs to be carried out. The main contractor (MC) appointed by the client for the refurbishment works on the structure re-engaged Martech to draw upon the in-house abseil access expertise, enabling cost-effective access for difficult repairs under direction of the MC.

Martech engineers worked on site for a number of days to assist with the works.



Insuring against corrosion



Martech was engaged by a well-known firm of consulting engineers to carry out a repeat safety survey (RSS) on a large East Anglian insurance office building.



Martech had already carried out a detailed concrete condition survey, plus safety surveys in phases some years ago indicating fairly extensive pre-cast concrete deterioration.

On RSS we always update the original defect lists which ultimately assists with repair requirement estimation.

In the absence of concrete repairs, Margel and protective coatings being carried out, it is strongly advised to carry out yearly repeat safety surveys to mitigate the risk of falling spalled concrete fragments precipitated by ongoing reinforcement corrosion and subsequent concrete decay.

