

Prince Bishops Multi-Storey Car Park



Prince Bishops MSCP, part of the Prince Bishops Shopping Centre complex, is located in the centre of the Durham. The car park provides 400 spaces and is constructed of a reinforced concrete frame supporting precast concrete planks with an insitu concrete topping.

Location
Durham, UK

Client
Blue Sky Consultants

Completed
February 2020

Structure
Multi-Storey Car Park



The Problem Identified

The car park was suffering from concrete spalling in the concrete decks and “tram line” cracking above the beams. Chloride induced reinforced concrete corrosion was identified within the structure exacerbated by construction weakness, such as plastic shrinkage, and low cover. Chloride levels in the decks were particularly high over the beam lines due to de-icing salt ingress via the cracks.



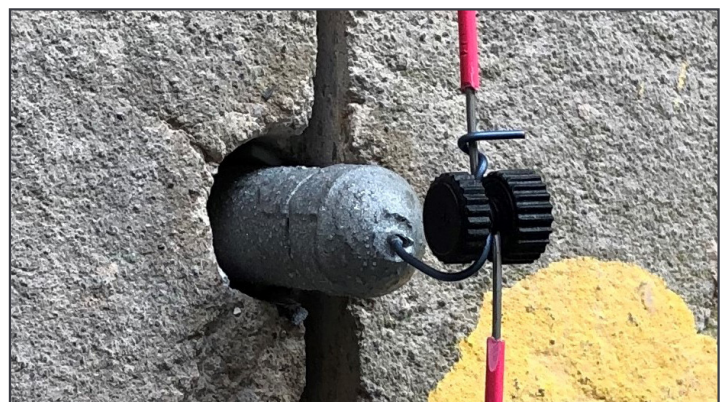
The Solution Developed

CPT was engaged to design a corrosion control solution. Away from the beam lines, PatchGuard anodes were installed around the boundary of patch repairs to prevent incipient anode induced corrosion which can significantly shorten the life span of patch repairs. Over each of the beams, PatchGuard Connect anodes were installed in four parallel lines to control corrosion in the heavily contaminated zones. Longer anodes were installed directly over the beams and shorter anodes were installed just outside the beam lines due to the slim nature of the deck.

Each beam on the deck was treated as a separate zone. Of the 95 zones across 5 floors of the carpark, 6 per floor were chosen to be monitored using manganese dioxide, MN15, reference electrodes.



Anodes spacing



PatchGuard Connect close up

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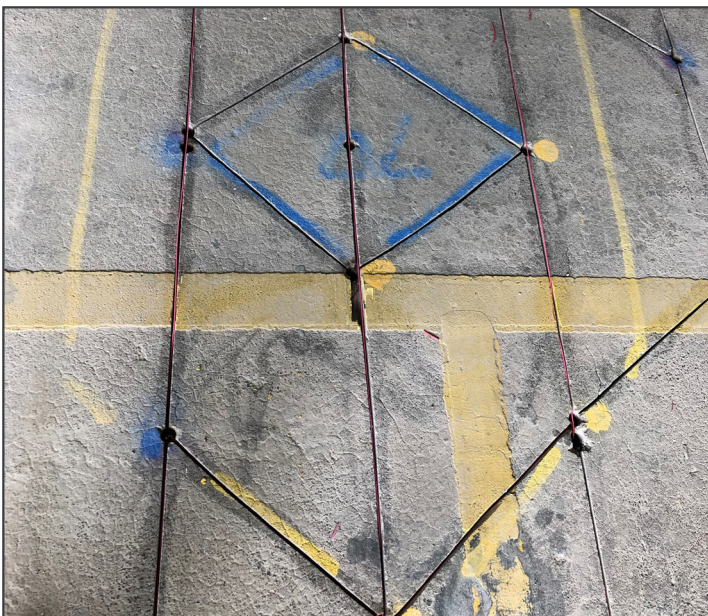


The Benefits Provided

PatchGuard and PatchGuard Connect are purely galvanic cathodic protection systems. The galvanic (or sacrificial) anodes act by corroding favourably to the steel, reacting to corrosion threats whilst supplying a protective current that counters the initiation of corrosion. Corrosion of the anode is non-expansive and does not negatively impact the structure.

PatchGuard Connect technology is a low maintenance solution.

The PatchGuard systems at Prince Bishops MSCP will provide long term corrosion protection to the reinforcing steel in the structure for a design lifetime of 15 years and quite possibly beyond.



Feeder wire saw cuts for the PatchGuard Connect system

CPT Products Used



PatchGuard™



PatchGuard Connect



DuoCrete PG Mortar



MN15 Reference Electrode

