

CASE STUDY

Car Park Refurbishment

MAKERS

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PROJECT

Coptfold Road MSCP

STRUCTURE

Multi-storey Car Park

CLIENT

Brentwood Council

CONTRACT



Coptfold Road Multi-Storey Car Park was originally built in 1972 with its concrete framed structure and brick outer skin, it consists of eight storeys with split levels and interconnecting ramps, providing 555 spaces. With floors of reinforced concrete waffle construction, it was showing signs of corrosion and spalling to the soffits with extensive wear and tear to the decks over the years.

Makers were awarded the contract after progressing through the tendering process with a Sika Specification for the inter-decks with corrosion control.

The uppermost levels provided parking for the adjacent residential block and were excluded from the tender.

The structure was found visually to have deteriorated and exhibited distress in some areas, with the exposed surfaces found to be variably weathered and discoloured, generally consistent with concrete elements cast and exposed in this environment for in excess of 40 years.

Diagnostic testing was carried out along with Half-cell survey to establish the depth of cover to the reinforcement, screening for Chloride, Sampling and also depth of Carbonation.



Before



Before

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Results showed that all 12 inter-deck levels were at risk of corrosion, 6 indicated a 50% risk and the other 6 levels indicating a 95% risk that corrosion was occurring. The depths of cover to the reinforcement were inadequate when compared to the standards in force at the time of construction, and were not acceptable by today's standards. The relative depths of cover to the reinforcement and carbonation indicated that in all areas tested, the carbonation front had not yet encroached the reinforcement.

Areas identified above 1% chloride content were treated with CPT (Concrete Preservation Technologies) DuoGuard Hybrid Anodes and areas below 1% were treated with Sika FerroGard 903 spray applied corrosion inhibitor. This was deployed to all inter-deck levels.



During



During



During

It required a full refurbishment programme, to protect it for the future and prevent any further corrosion.

Areas of defective concrete were identified by hammer testing which was removed, ensuring not to cut through existing reinforcement or beyond the defective area. Any exposed reinforcement was prepared with mechanical brush to standard equivalent of SA2 quality.

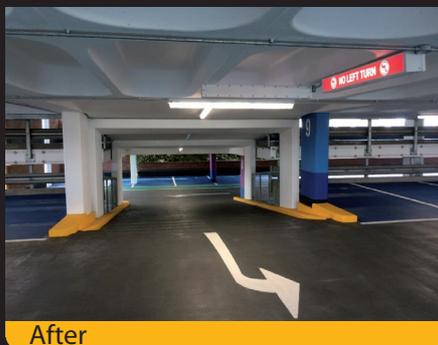
The concrete decks were uneven and also consisted of tampered areas, these were prepared by planning and vacuum blast techniques. All edge details were prepared by planning with dust extraction units and damping dust control. Soffits, walls and columns were cleaned with high pressure water jetting to remove all deleterious material from the surface on all 8 levels, ensuring a clean surface for over coating.

The drainage system and gullies were inspected and cleaned with replacement of grating where required. A new lighting system was installed along with new electrical signage and stairwells were refreshed with coatings for new decoration.

Concrete repairs to the deck were reinstated with Sika Rapid repair mortar, and repairs to soffits and column areas were carried out using Sika Monotop 610 bonding bridge and Sika Monotop 615 Repair Mortar. The decks required Cathodic Protection and hybrid anodes were installed, followed by Sika FerroGard 903 corrosion inhibitor and decks were waterproofed with EB24 Sika and RB28 Fastcure.



After



After



After

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