

Shopping Centre MSCP's Refurbishment

Merry Hill Shopping Centre, Dudley

SCOPE

- // Hydro-Demolition
- // Concrete Repair
- // Carbon Fibre
- // Structural Strengthening Plates
- // Anti-Carbonation Coatings
- // Intumescent Coatings
- // Deck Waterproofing

DETAILS

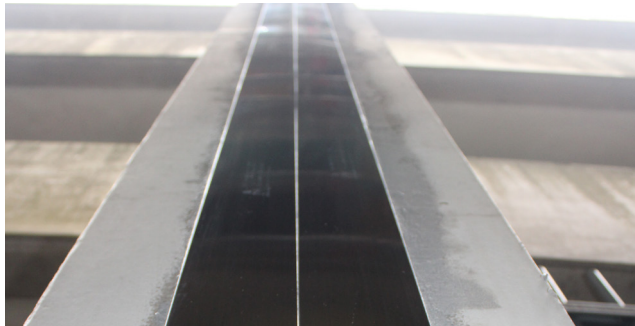
- // Shopping centre car parks
- // >7,000m2 of parking decks re-waterproofed
- // > 4,000LM of carbon fibre plates installed to beams
- // Columns and underside of beams protected with anti-carbonation coatings
- // Significant concrete repairs & resin injection to soffits, columns & walls.
- // Intumescent coatings to structural steel columns

Case Study //

Car Parks

Client | Savills PLC
 Role | Principal Contractor
 Waterman Group

Before: Dark & Unwelcoming Environment With Corroding Steel



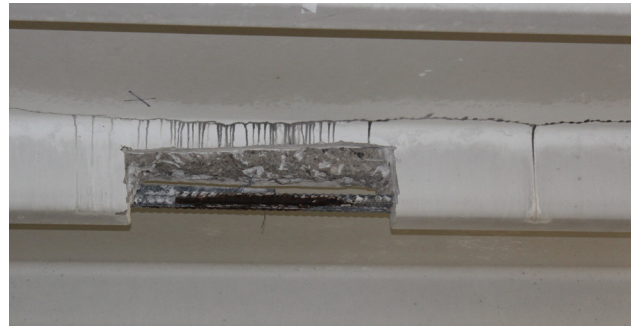
During: Carbon Fibre To The External Columns

The scope of this refurbishment was to repair and strengthen the Purple and Green multi-storey car parks at Merry Hill Shopping Centre in Dudley which receives an average of 25 million visitors per year.

Following considerable testing and investigations, the engineers were able to determine that due to several factors including de-icing salt exposure, the steel reinforcement was corroded resulting in loss of strength and cracking of the concrete due to the structure movement. This led to the Green car park being closed for several years whilst appropriate solutions could be considered by the client and engineers.

Cemplas worked with Savills and Waterman to provide expert technical support for these solutions before being asked to carry out an extensive programme of works for

Before: Current Car Park Layout



During: Series Of Concrete Repairs To Beams & Ribs

both car parks.

Green Car Park

With a full closure in place, the entire 4-storey structure was repaired using concrete repairs to the external and internal columns, beams and soffits with resin injection to any cracks which had appeared on the deck due to either general wear and tear or chemical exposure.

Once all 280 beams were repaired, they were prepared with Sikadur 30 and Sika Thinners C to ensure a dirt and dust-free environment before the precisely cut Carbon Fibre Reinforced Polymer (CFRP) laminates, Sika's CarboDur S Plates were bonded to the underside of the beams in accordance with the engineers recommendations and the final design – totalling in excess of 4,000LM. Anti-

During: Application of Carbon Fibre



During: Corrosion To The Steels

carbonation coatings were applied to the columns and underside of the beams to further protect the concrete and to camouflage the carbon fibre to make it unnoticeable to the eye.

Due to their high strength and low weight, a smaller amount of material was required – reducing the costs for our client while still achieving the same level of strength as steel. The use of CFRP laminates was also chosen to reduce the risks of manual handling, lifting operations, logistics and the amount of labour required on site.

The original design for the carbon fibre was a preliminary design with Cemplas and our designers formalizing a design which included the final sizes and details of installation for the engineers to approve before works could commence.

Case Study // Car Parks

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To enhance the visitors experience of this car park, Level 2 which houses the entrance and exit required re-waterproofing. Captive blasting was used to remove the existing deck coating and to prepare the substrate for the application of Deckmaster's HFS ID traffickable anti-slip system to 7,000m² in contrasting colours of light/dark grey and blue.

Working to futureproof the car park for years to come, this refurbishment means that the structure is also prepared for vehicles of the future such as Electric Vehicles which are considerably heavier than traditional internal combustion engine vehicles.

Purple Car Park

This car park, located on the other side of the shopping centre, was a live environment and also required structural

strengthening to the steel which were encased within concrete. To ensure a dust-free environment, hydro-demolition was used to break-out the concrete showing the serious extent of corrosion to the steel.

A steel survey of the columns was conducted for the engineers to decide which columns required further strengthening with steel plates welded into position. Before these steel plates could be welded onto the steel columns all steelwork had to be grit-blasted back to bright metal to remove all the corrosion.

An intumescent coating was applied to ensure the fire protection of the steel columns, which swells into the event of a fire to protect the steelwork underneath, Berry's column protectors were then installed.

This refurbishment project to Merry Hill's busiest car parks was completed within budget and open in time for the Christmas period, the busiest time of the year for the shopping centre.

Cemplas also provide a comprehensive car park technical support and specification service, our team will visit the site (with manufacturers) to visually assess the structure and recommend further testing and surveys if required. We will then produce a detailed product specification, method statements and any budgets. This is a free service with our partners and we can then take on full design and refurbishment contracts worth £million's as a principal contractor.

For further advice and/or information regarding ALL of our services, please visit www.cemplas.co.uk.



During: Repaired & Protected Structural Steel Columns



After: Fully Protected Decks



After: Light & Bright Interior Improvements

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