

CASE STUDY

Full Car Park Refurbishment

PROJECT

Preston Bus Station MSCP

STRUCTURE

9 Level Storey MSCP

CLIENT

Conlon Construction

CONTRACT

Designed in the late 60's this 9 level multi-storey car park consisted of cast in situ reinforced concrete slabs and columns built in the 'Brutalist Style'.

Each of the 9 parking decks is approximately 190m long and 16m wide with supporting columns inset from the slab edge providing 1169 parking bays.

This iconic structure is best known for its scalloped fins along the 190M length and was part of its saving glory when trying to obtain Grade II listing in September 2013.

As was typical of the construction of the day no protective coatings were applied to the inner concrete car park decks on levels 3 to 7 along with the external concrete ramps spanning 10.67m which are external at both north and south of the structure.

The refurbishment aim was to fully restore and protect the iconic 1960s design whilst still in operation to the 10,000 people per day who used it. Bringing it into the 21st Century incorporated modern technology of EV bays and new lighting systems, providing a user friendly, fresh feel to the car park.

This included preventative measures to include anti-suicide fencing to reduce the high suicide rate at Preston Bus Station.

T :08458 994444

F :01543 480676

E :enquiries@makers.biz

W :www.makers.biz

Makers Office Building 4,
Shenstone Business Park
Lynn Lane, Shenstone, WS14 0SB

Registered in England No:6348341 Registered Office as above



Before



After

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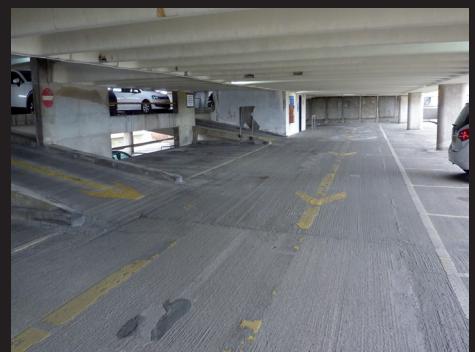
...makes the difference



Before - Top Deck



Before - Spiral Ramps



Before - Internal Decks

A large volume of deck repairs were required caused by unprotected concrete, allowing moisture to reach the low covered reinforcement bars.

After repair and jet wash the external concrete scalloped shaped façade surfaces were protected using Sikagard 550w producing an aesthetic finish to the complete façade, again protecting from environmental chemical attack.

The internal decks were planed and required corrosion control and waterproofing, some deck levels required Duoguard Hybrid anodes and decks 4 to 6 had the Impressed Current Cathodic Protection corrosion control system install to identified areas. The decks were then blasted to remove any contamination and chases and cracks were treated with liquid resin reinforcement fleece before the application of Sika EB24 system.

The northern and southern ramps were planed to remove the heavy tamp. Once repaired, chases were cut into the deck and the Impressed Current Cathodic Protection corrosion system was installed along with Duoguard hybrid anodes to localise areas. Chases and cracks were treated with liquid resin reinforced fleece before the application of Sika RB28 ramp system. The existing vehicle ramp support steel slider bearings were badly corroded and replaced with new elastomeric support bearings which were designed and installed to both the northern and southern ramps.

In order to carry out repairs and corrosion protection to the scalloped fins Makers were innovative in the design of external cantilever mobile platforms, which were designed specifically for Preston Bus Station to allow access to the external curved facades. They were designed to withstand all weather elements, including high winds and torrential rain and enabled Preston Bus Station to maintain an undisrupted bus timetable and the car park operational.



During - Internal Deck



During - Ramps



Cantilever Mobile Platform

T : 08458 994444

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E : sales@makers.biz

W : www.makers.biz

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Before - Top Deck



During - Top Deck



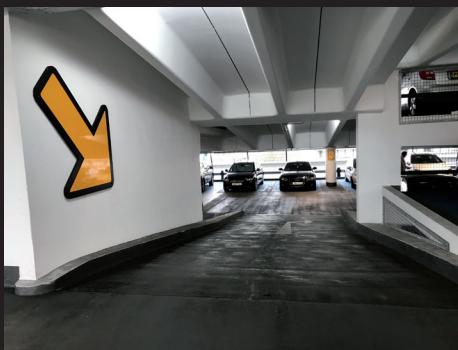
After - Top Deck

The exposed asphalt top deck was displaying signs of fatigue where areas had become worn and smooth and heating and cooling cycles had caused the asphalt to crack, split and allow water penetration through the asphalt into the supporting slab. For the asphalt top deck and levels 1 and 2, tensile adhesion tests to satisfy the required pull off test strengths were carried out prior to the Triflex DFS system being applied. Decks were fully blasted using a captive blast machine and all splits and cracks were repaired and treated with fleece bandaging. Wheel indentations were filled to isolated areas on the deck before installing the full Triflex Deck Floor System. Once installed the coatings received the corresponding parking bay and directional arrow signage.

The existing failing movement joints were removed from levels 1 to 9 and also from the northern and southern entrance and exit ramps. The Emseal DSM expansion joint was installed to the decks along with the Emseal Colourseal expansion joint to internal deck columns.

A new efficient dedicated lighting scheme was installed to provide industry standard lighting. This required the complete removal of the existing system and replacement of distribution boards and incorporation of fire safety lighting. Particular attention was given to circulation ramps and entrance and exit to the car park.

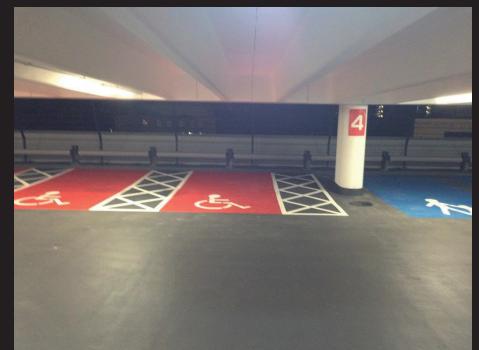
Six Electrical charging points were installed on parking level 1, discreetly placed on the inner bays of the car park to tie in with the electrical cable feeds and all are IP 54 rated for external use. Split level guarding mesh was also installed to the inner bay areas to add additional safety. A modern fresh approach to the signage details within the car park meant that the car park deck level numbers now run from 1 – 9 on the inner columns. The addition of CCTV and various parking allocations for disabled, parent and child, and motorcyclists have made it a much safer and inclusive welcoming environment for all.



Circulation Ramps



Internal Deck - EV Bays



Disabled Parking

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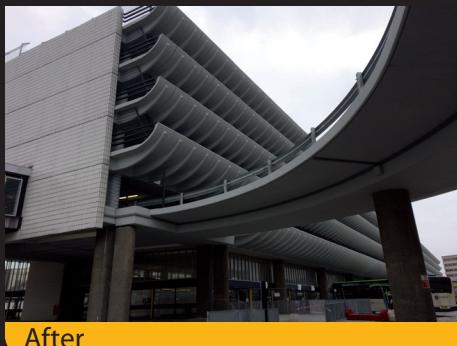
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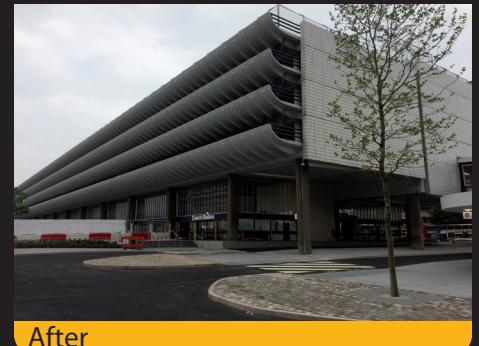
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Before - Tiled Exterior Elevations



After



After

The gable ends north and south elevation of the car park had ceramic tiles missing and also cracked tiles allowing water ingress to the concrete structure beneath. The tiles were imperial sizes and the refurbishment need to comply with English Heritage Grade II requirements. After hammer testing and inspection of all tiled surfaces a total of over 600 tiles were replaced.

A sample of the existing ceramic tile was taken and an exact replica was manufactured by Phoenix Tiles to ensure continuity of its aesthetic exterior to requirements.

Makers used various methods throughout the refurbishment which included Impressed Current Cathodic Protection, Hybrid Anode Duoguard anodes, Sacrificial anodes Galvashield XPT and Corrosion inhibitor Ferrogard 903 to concrete areas not repaired or treated with the ICCP, Duoguard or Galvashield.

Concrete soffit, columns and internal wall surfaces were protected using Sikaguard 670w, producing a highly aesthetic finish to provide a bright clean feel to the entire car park. The anti-carbonation properties of the paint coating provide additional protection against environmental chemical attack as well as providing additional light reflecting lux properties for the new lighting system.

The car park at the grade II listed building owned by Lancashire County Council has been granted Park Mark accreditation which is awarded following a rigorous risk assessment conducted by the police and British Parking Association. The Authority has also received Disable Parking Accreditation for the car Park.

County Councillor Keith Iddon, cabinet member for highways and transport, said “*We know that some people chose not to use this car park in the past, but things are very different now. Our recent development work has made the car park levels more welcoming and is already encouraging people to park here.*”



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