

CASE STUDY

Multi-Storey Car Park Refurbishment

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PROJECT

Intu Victoria Shopping Centre

STRUCTURE

In-Situ reinforced concrete frame with coffered slabs

CLIENT

Intu Retail Services Ltd

CONTRACT



The Nottingham Intu Victoria Shopping Centre sits on the original site of the Victoria Train Station which was demolished in 1967 with the exception of the Clock Tower which remains today and was incorporated into the redevelopment scheme that took place between 1967 and 1972.

Within this site the stand-alone multi-storey car park known as the "white car park" was created within the railway cuttings and is sited within the excavation so that the roof level is level with street level. The Victoria Centre more commonly referred to as "The Vicki Centre" by its locals provides parking for 2700 vehicles. It contains a host of leading brand retailers and anchor stores such as John Lewis and achieves an annual footfall of 24 million.

The refurbishment of the project had to be co-ordinated with other works to ensure a workable level of parking was available to customers of the Centre. The key to the success of the refurbishment was ensuring the planned works were completed to coincide with the main public holidays when parking demand rapidly increased.

Originally the client had specified the total removal of the existing membrane and replacement of the existing movement joints. Test results had shown that the system was well bonded and that it was worn in only a few locations. After consideration the thickness of the slab some 70mm thick, a different approach was designed to protect the existing concrete structure and incorporate the existing membrane.

Following a significant testing regime, we were able to overcoat the membrane and use it as part of the new incumbent protection system. The result was this saved both time and money for the client but moreover removed the need to reduce the thickness of the slab which was already at risk.

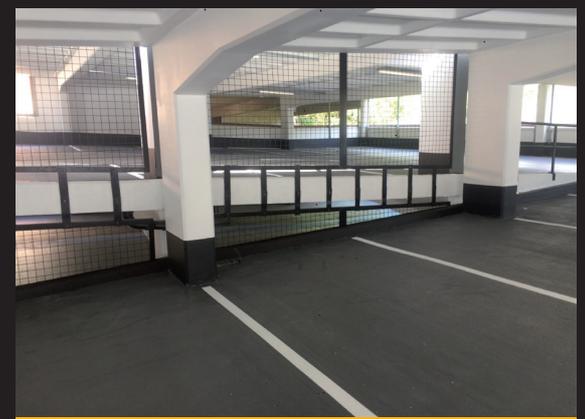
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Before



After

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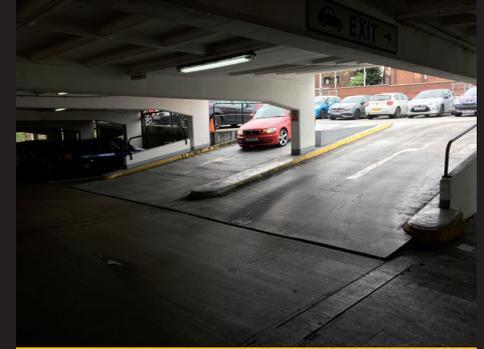
...makes the difference



Before



Before



Before

Although the deck was comparatively in good shape, testing proved the car park had several chloride corrosion issues that had to be addressed. Due to relatively thin thickness of the slab we incorporated C-Probes corrosion control design which allowed for the sacrificial zinc table to be installed around the reinforcement and specialist "acid resisting" conductive mortar to be moulded around the anode providing a corrosion design that could be accommodated within the structure.

Driving surfaces were protected using a combination of Triflex membrane systems. These systems were chosen for their performance durability and ability to cope with certain subjected criteria. Ramps and circulation ramps received the Triflex Pro Park system and the larger parking areas the more cost-effective hybrid system Triflex CPS-C. All membranes came with a material and workmanship 10-year guarantee position. The Joints within the car park had created a difficult design issue as the rigidity fixed drainage gutter could not cope with the movement being experience throughout the length of the car park some 15mm!!

The original drainage design was created at the mid span of the slab across a movement joint. The ridged drainage design could not cope with the movement experienced in the car park resulting in leaks within the system that corroded the conduit which eventually failed. Excessive movement within the car park meant that alternative flexible solutions needed to be considered when replacing the conduit and controlling the internal drainage system. The concrete adjacent to the slotted drains had to be treated with a cathodic protection system.

All concrete surfaces required protecting to ensure a 20-year design life. The external parapet façade was accessed and the surfaces were cleaned by high pressure water jetting, repaired using Sika Monotop system and then coated with the Sikagard flexible coating Sikagard 550w. As this was an external coating the chosen colour was sympathetic to the surrounding environment.

All internal walls, columns and soffits were coated with Sika 670w anti-carbonation coating providing a lighter, brighter reflective surface. To provide protection Triflex HD was applied for the ramp system and turning circles and barriers were re-instated where loose which received a fresh coat of paint. LED lighting technology was introduced for energy saving measures and reduction of light pollution which was an issue for local tenants overlooking the car park.

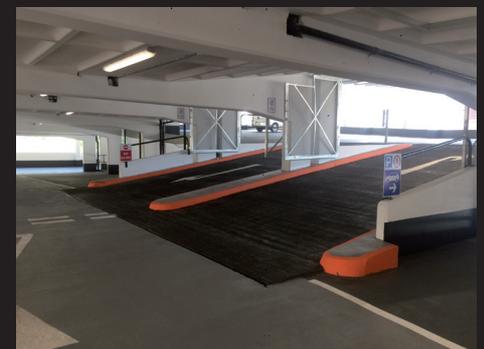
The works consisted of a full refurbishment designed to give a 20-year design life to the structural assets and a 10-year design life to first maintenance.



After



After



After

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