As part of ongoing improvements and expansion of the Southampton General Hospital site, a new multi storey car park was commissioned to alleviate the onsite parking shortage for staff and research personnel. The car park was constructed from precast concrete units that required a structural concrete topping, overlain with a flexible bituminous wearing course on the top level.

**Challenge**

The 100mm topping overlaying structural precast concrete planks, requires reinforcement to control cracking to ensure service life is maintained in this type of application. Conventionally, a single layer of welded steel mesh is used to provide this reinforcement.

Due to the restricted working area and practicality of handling steel mesh at height as well as in and around the multiple levels, a macro synthetic fibre alternative was requested to replace the layer of steel fabric.

The 100mm depth of the concrete topping also presents the likelihood of insufficient cover for the steel mesh during placement of the concrete. This would lead to a high risk of corrosion and subsequent issue with early loss of serviceability.

**Solution**

After consultation with the Contractor, ADFIL proposed a Synthetic Macro Fibre Solution using 4kg/m$^3$ of DURUS S400 to replace the single layer of steel mesh. This solution also allowed bay sizes to be maintained as per the original specification.

ADFIL also worked with the Concrete Supplier and Flooring Contractor to ensure the concrete mix was of the correct consistence to pump, place and finish.
Benefits of the solution

- The replacement of the steel mesh reinforcement with DURUS S400 synthetic macro fibres has eliminated the high risk of steel corrosion resulting from exposure to deicing salts from car tyres. As a consequence the service life of the topping has been prolonged.

- There was no need to handle, cut and place steel mesh. This resulted in a more efficient installation, and elimination of significant health & safety hazards, along with a time saving.

- No cranes were required to move the steel from ground level to the top of the structure. This eliminated significant Health & Safety hazards during construction and giving a significant cost saving.

- A reduction in embedded carbon was achieved, when compared to the original steel mesh solution.

Installation benefits

- Over 1100m³ of reinforced concrete topping was placed directly without the need for steel mesh handling, cutting & fixing, reducing the construction time significantly.

- There was no possibility of misplacing the reinforcement as it is uniformly distributed throughout the concrete when delivered to site.

- The macro synthetic fibre concrete can be easily pumped into position from ground level.

Result

The structural topping was installed on schedule without the need for placement, cutting & fixing of steel mesh, which would present additional time along with significant health & safety and logistical issues.

Products used: DURUS S400

Macro Synthetic Fibre DURUS S400
Dosage of 4kg/m³ to provide protection from shrinkage cracking and enhance the durability of the 100mm screed topping.