

Southampton General Hospital Multi Storey Car Park Topping

Southampton, Hampshire, UK

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.



Project owner
Interserve

Product
**DURUS S400 Synthetic
Macro Fibre**

Function
**Macro Synthetic Fibre
Reinforcement to replace
conventional steel fabric
in a Structural Concrete
Topping cast on Precast
Planks.**

Contractor
Nationwide Concreting

Volume
**1100m³
4400kg DURUS S400**

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/m³ 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.



The use of DURUS S400 allows large areas to be flood poured without any risk of disturbing in-situ steel mesh reinforcement. Insufficient concrete cover is also not a factor as the reinforcement comes ready mixed in the concrete, which can be easily pumped into position.

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.



Owing to the confined working area, the handling cutting and fixing of steel mesh would present significant health & safety hazards during installation of the topping, and would also be very time consuming.

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.