



Proven Performance

FIBRE REINFORCED CONCRETE FOR LIVERPOOL 2, PHASE 2, DEEP WATER CONTAINER TERMINAL

The challenge

This major expansion of the deep-water container terminal at Liverpool docks would significantly increase the footprint and capacity of the site. The site handles the world's largest container ships and connects road, rail and canal networks directly to the heart of the UK mainland. As part of this project, external concrete surfacing was needed that would deliver long term resistance to the high volumes of HGV traffic using the terminal. The original specification used heavy grade conventional steel mesh reinforcement with air entrained concrete for frost protection. However, the contractor Mc Laughlin & Harvey wanted to explore alternative solutions to help minimise construction time and cost, while ensuring a long service life and lasting durability on this challenging site.

Our solution

After discussions with the contractor, the solution proposed was Tarmac's TOPFORCE fibre reinforced concrete with a combination of synthetic macro and micro fibres. TOPFORCE can eliminate the need for some traditional steel reinforcement, making it quicker and easier to place. It offers excellent long-term durability making it ideal for commercial and industrial sites used by HGV traffic. This solution would deliver a saving in both labour and material costs and avoid the budget impact of the rising cost of steel. As well as improving the durability and structural performance, the use of macro fibres also improved sustainability significantly by reducing embodied carbon compared to traditional steel reinforcement.

Results and benefits

Around 4,000m³ of TOPFORCE fibre reinforced concrete was supplied to the site and work was successfully completed in line with the challenging schedule. As expected, the contractor achieved significant time savings by using this solution. There was no need for heavy steel mesh to be transported, stored, handled, cut and placed, which reduced construction time and eliminated significant health and safety risks. Using TOPFORCE also helps to reduce embedded carbon emissions compared to steel mesh reinforced concrete. The carbon footprint of concrete reinforced with macro synthetic polypropylene fibres is up to 60% lower than that of steel mesh reinforced concrete, with additional savings in carbon emissions from avoiding the need to transport the steel mesh to the site.