

High-quality concrete protects London Bridge

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In November 2011, Costain was awarded a design-build contract worth £400m for the redevelopment of London Bridge station under Network Rail's £6bn Thameslink Programme (RG 12.11 p50). The contract includes the provision of a new concourse at street level and improving the entrance and exit points to ease access; the work is expected to increase passenger capacity from 50 million to 75 million passengers annually.

With a project of this scale and complexity, a very high volume of fresh concrete must be cast, and structural mortars and fairing coats have been used to enhance the concrete finish and increase the durability of the construction. Flexcrete Monomix, a waterproof, low-density, class R3 structural mortar, was specified [*by Costain or Network Rail?*] to facilitate rapid construction — a critical factor as the station must remain open and fully operational throughout the redevelopment works.

High strength

Incorporating proven cement chemistry comprising microsilica, fibre and styrene acrylic copolymer technology, Monomix is a pre-packaged, single-component product, only requiring the addition of clean water on site to give an easily-malleable mortar with application thicknesses up to 80 mm. Suitable for application to vertical, horizontal and overhead surfaces, it develops exceptional bond strength, excellent tensile and abrasion resistance, high-diffusion resistance to acid gases and chloride ions and low permeability to water, even at 10 bar pressure. Its high compressive strength reaches 23.5 MPa within 24 h of application, increasing to 42 MPa within 28 days. Monomix conforms with both UK and European concrete standards.

The ability to apply Flexcrete products to 'green' or freshly-laid concrete also led the delivery team to choose our Monolevel FC product where a 'fair-faced' finish was required. Monolevel FC is an engineering-quality fairing coat which can be used in thin screed applications to level both vertical and

horizontal concrete surfaces and to re-instate cover, whilst providing an anti-carbonation finish.

The high bond strength of Monolevel FC exceeds the tensile strength of concrete and its dense matrix provides excellent protection from the ingress of acid gases, moisture and chlorides. Importantly, it is also non-toxic when cured and releases no hazardous solvents or heavy odours during application. This is a significant consideration for a high-profile project in a busy public space. Monolevel FC is suitable for use without further protection or coating. At London Bridge, it was specified in white to ensure the fairing coat matched the colour of the freshly-cast concrete.

These products have helped to enhance the finish as well as the durability of the new structures, and should contribute to the design life of the revamped concourse being accomplished if not extended. ■