

Somero SXP laser screed and STS topping spreader in action.



Flooring teamwork

Technic Concrete Floors was contacted by main contractor BAM Construction at the commencement of the tender process for a design-and-build project at Manchester's Airport City. This communication continued throughout the design process, with the flooring firm providing advice, assistance and various value-engineering opportunities. James Donnelly of Technic Concrete Floors reports.

Described as being 'set to change the UK's economic landscape', Airport City is one of the UK's most prestigious projects. An £800 million landmark investment, it has been used as a protagonist for strengthening the economic and business relationships between the UK and China.

Global logistics firm DHL became the first business to agree a location – for a 160,000ft² (14,900m²) site – on the new development.

Subsequent to its appointment, BAM Construction engaged Technic Floors to undertake the design and construction of the internal, external and mezzanine in-situ concrete floors for the project.

The project began with the installation of the composite floor slab, installed onto steel decking. Construction of the 150mm slab to a structural thickness was in accordance with advisory documents from both The Concrete Society and the Steel Construction Institute.

Design teams

After considerable liaison between the respective design teams, the warehouse slab design was finalised with a 185mm slab and a layer of A252 fabric reinforcement being placed in the bottom of the slab. This enabled the slab to be cast in accordance with the large-bay flood pours required by DHL and as detailed within The Concrete Society Technical Report 34⁽¹⁾.

Given the prestigious nature of the project, it was imperative that particular attention was paid to every detail. With this in mind, ACS Lining, a specialist gas and waterproofing membrane company, was used to ensure that all of the sealing around the column and perimeter edges was carried out to the highest possible standard.

At the time of pouring the internal warehouse slab, the hottest day of the year was encountered. Due to this, and the fact that each of the pour sizes was in excess of 250m³, it was imperative that the performance of the flooring team and the concrete supplier Hope Construction Materials was sufficient to cope with these challenging conditions. Following the early communication with Hope, a prescribed mix design and rate of supply of the concrete were agreed by all parties. Part of the success of the project can be attributed to the adherence of these agreements at all times.

In order to construct the slab in accordance with the large-bay flood pour technique, a Somero SXP laser-guided automated screed machine was used. The machine levels and compacts the concrete, checking the levels of the concrete six times every second.

Due to the late discovery of differential ground conditions, it was not possible to operate in the traditional manner of discharging the concrete directly from the back of the concrete delivery wagon onto a strip of preset fabric reinforcement, progressively being installed ahead of the laser screed. Demonstrating the flexibility and collaborative approach taken throughout the project, an alternative approach was formulated using two mobile pumps to resolve the issue of the concrete delivery wagons trafficking the sub-base.



Dock levellers isolated using Permaban Signature joint.

Below: Aerial view of the flagship scheme.



Large-bay pours

Each of these large-bay pours and the isolated dock leveller areas were cast within Permaban Alpha joint, which provides a heavy-duty aris protection and efficient load transfer between each of the bays due to the incorporated plate dowels.

The project was subjected to inspections by UK political leaders, such as Deputy Prime Minister Nick Clegg, and international politicians and dignitaries. All of these visitors were eager to inspect the quality of the flagship scheme for the new development at Manchester Airport. With this in mind, a rigorous quality control system was agreed between all construction parties and implemented throughout the project. Elements of this system included the taking and testing of samples of the concrete by independent testing laboratory GT Certification. The production of an independent survey and report to confirm that the floor slab had been installed to the required flatness tolerances was carried out by Face Consultants.

Face Consultants' specialist surveying equipment measures the deviations in the floor slab to within 0.1mm and the report confirmed that the floor slab presented a significant increase in the quality of flatness from the FM2 tolerance (TR34 Fourth Edition) specified, with various parties commenting on both the flatness of the floor slab and the outstanding aesthetic quality produced.

The external floor slab was carried out using both

the Somero SXP laser screed and direct discharge construction methods. The flooring design team was, again, in constant communication with BAM Construction in order to ensure that the intricate falls required by the Gatic drainage solutions were achieved. These falls, coupled with the various different finishes required on the floor slab due to the proposed usage of the service yard by DHL, resulted in completion of the 13,000m² external floor slab in 12 pours and installed to the exceptional standard demonstrated with the warehouse slab.

The prestigious nature of the project resulted in all aspects of the construction being subject to the highest levels of scrutiny from both construction professionals and political and business leaders of the highest calibre.

It is testament to the performance of all contractors and suppliers, that the floor slabs were cast to an extremely high standard, four weeks ahead of programme and within budget. This is only the first stage of investment at Airport City and there will undoubtedly be future construction projects on this development. ●



Tight tolerance specified to enable racking system.



High-quality powerfloat finish achieved.

Reference

1. CONCRETE SOCIETY. *Concrete industrial ground floors – a guide to design and construction*. Technical Report 34, Fourth Edition, The Concrete Society. Camberley, 2013, Reprint June 2014

The return of the long game

The floor of a huge new distribution centre in France has been finished using two different surface-hardening techniques. Tom Hancock of Permaban (part of RCR Flooring Products) explores why the continental approach to industrial floor protection is set to make a comeback in the UK.

Those responsible for creating an industrial floor make a key decision during the specification process. They decide – intentionally or by default – how long that floor is going to last.

Some make the decision to build cheaply and worry about the consequences later – or not worry about them at all. When the floor surface is damaged beyond recognition in a few years' time, it will be someone else's problem on someone else's budget; so why burden today's project with tomorrow's costs? During tough economic times it's not difficult to understand the cost driver behind this approach.

Yet for others, the decision is to do things 'right first time' – to build something with a an expected lifespan and which will give better performance and thus reduce operational costs. It's encouraging now to see more clients, and even developers, adopt this longer-term thinking. They appreciate that there is hard cash to be



Dry-on-wet application.

made or saved by investing in the floor. For the industry, this change in attitude and confidence has to be one of the 'greenest shoots' of recovery.

Case study: Distribution centre, western France

A French automotive components giant is one company proving the point. Established for over 50 years, and with an international presence, the company turns over €50 million and employs 60 people.