

Europe's largest Cemfree concrete pour, Chatham Station, Chatham, Kent

Project case study



Product

Cemfree concrete

Volume

300m³

Client

BAM Nuttall, working for Network Rail

Overview

Hanson has supplied Cemfree concrete in a continuous 10-hour pour as part of an Access for All scheme at Chatham Railway Station, Kent. It is the first time the product has been used on a Network Rail infrastructure project and is the largest Cemfree pour to date.

Project description

Chatham Station in Kent has two platforms and serves an average of three million people every year. Its Access for All (AfA) scheme – part of the government's AfA programme, which aims to provide obstacle free, accessible routes to and between platforms – is being delivered by BAM Nuttall, under the Southern Multidisciplinary Framework with Network Rail.

The scheme involved the removal of the existing stepped only footbridge structure and replacement with new modern Disability Discrimination Act (DDA) compliant footbridge, stairs and lifts between the platforms and ticket hall.

During the design development stage, the project team realised the presence of a disused cellar situated beneath one of the platforms, measuring approximately 20

x 6 metres. This had previously been used as both a coal store and railway workers' social club in the past but had become a redundant asset with no beneficial use and a maintenance liability for Network Rail.

The foundations for the new AfA structure were also required to bear down upon the cellar location so it was decided the best option was to in-fill the cellar.

The BAM Nuttall delivery team realised an opportunity existed to explore the use of a new, innovative carbon saving material, having been introduced to Cemfree about a year in advance of the project.

Working collaboratively, the BAM Nuttall and Network Rail engineering teams, alongside Robert West Consulting, Hanson Concrete and DB Group, developed the design and methodology to

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Access for All scheme



enable the Cemfree material to be used.

In advance of the main pour, Hanson undertook trial mixes, including rheology assessment and slump retention to check the mix design both for pumpability and ease of placement. The target 28-day strength was 10 N/mm² and the concrete actually achieved an average of 14 N/mm² at 28 days.

To enable the use of Cemfree on a project such as this, Hanson needed to make a silo available at a ready-mixed concrete plant for storage of the alkali-activated cementitious material.

Originally the assumption was that the concrete would be supplied from Hanson's nearby Rochester plant. However, it was quickly determined that this would not be feasible due to the limitations of only

two silos on site and an extensive order book. At this point Hanson identified that its plant at Sittingbourne would be better suited due to an additional silo on site. Once the decision was made, preparations were started to ensure the silo was run down, cleaned and prepped for the arrival of the delivery of Cemfree.

The cellar fill was undertaken as a continuous pour over a 10-hour period during a full planned closure of the railway. The use of a concrete pump with boom across the tracks was required due to the access restrictions at the location.

The 300m³ pour was the largest single use of Cemfree to date and the first time the product had been used on a Network Rail infrastructure project. Its use generated 62 tonnes of CO₂ savings,

equating to 83% compared to Ordinary Portland Cement (OPC) concrete, equivalent to 62 return flights from London to New York.

"As a society we all have collective responsibility to seek to reduce our carbon emissions wherever possible," said Nick Moss, senior agent at BAM Nuttall. "The use of Cemfree at Chatham Station is a significant step towards meeting Network Rail's carbon saving targets, and the government's long-term goal of net-zero by 2050. It was a pleasure to work with the team at DB Group and Hanson to help demonstrate the benefits for the use of Cemfree material on this project."

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