

“CEVO Digital from Tarmac is a fantastic example of how technology can support lower carbon construction. Using CEVO Digital alongside lower carbon mixes allows us to maximise efficiency and make real-time decisions based on live performance data.”

Christopher Wellgreen, Sustainability, Carbon and Systems Manager - J Coffey Construction

SOLUTIONS

SUSTAINABLE CONSTRUCTION

Using Digital Innovation to Deliver Lower Carbon Concrete at Oxford Science Park



Oxford Science Park is one of the UK's leading centres for scientific and technological innovation, home to more than 100 businesses and around 3,350 people. Its latest development, a 450,000 sq ft commercial life science campus comprising advanced laboratory and office buildings, has been designed with sustainability embedded throughout, from air-source heat pumps to renewable energy systems and high-efficiency ventilation.

To support the project's environmental ambitions, main contractor J Coffey Construction wanted to utilise a lower carbon solution for the traditionally specified high early-strength concrete mixes, whilst maintaining structural

performance and programme certainty.

A Lower Carbon Approach with CEVO Concrete

Working closely with the J Coffey Construction, Tarmac proposed a CEVO lower carbon concrete solution that combined limestone filler - reducing clinker content at the cement stage - with 30% and 50% GGBS blends to replace a proportion of Portland cement. This approach enabled carbon reductions of up to 46% while delivering the strength and durability required for a demanding laboratory and office development.

The CEVO solution reflected the project's wider commitment to lower carbon construction and demonstrated how early engagement can unlock significant emissions savings without affecting performance.

Enhancing Performance Through Digital Sensors and MixAI Technology

To strengthen confidence in the optimised mixes and enable efficient decision-making on site, Tarmac embedded digital technology into the delivery process through its CEVO Digital offer.

A total of 53 in-situ digital sensors were installed across the project to provide real-time strength monitoring. This allowed the team to track curing behaviour, validate actual performance against predicted outcomes, and understand how ambient conditions were influencing strength gain. The data ensured that the lowest-carbon mix which would still meet performance requirements could be selected at every stage.

Alongside the sensors, Tarmac used its MixAI

predictive modelling technology to pre-optimize concrete mixes. MixAI assesses performance before placement, giving contractors the assurance that lower carbon options will meet the required build schedule. This combination of predictive modelling and in-situ verification created a fully digitalised approach to reducing embodied carbon.

Delivering Measurable Carbon Savings

Across 4,501m³ of concrete supplied through 28 pours, the project achieved significant embodied-carbon reductions. More than 535 tonnes of carbon were avoided compared with the original CEM I design, representing a 38% saving, which resulted in a total footprint of 869 tonnes of carbon instead of the predicted 1,404 tonnes. Locally sourced materials further reduced transport-related impacts.

“Introducing the MixAI software to provide pre-calibrated mix designs is a real game-changer for the digitalisation of concrete. From an early stage, it allows us to identify, optimise and engineer out concrete overstrength, delivering the carbon savings that are required on site. Nobody else in the industry can offer this combined solution, bringing together lower carbon concrete with sensors and our MixAI technology to optimise carbon savings at every step.”

Joe Kirwin, Commercial Manager for London & South East Readymix - Tarmac

The contractor echoed the value of the integrated approach. Christopher Wellgreen, Sustainability, Carbon and Systems Manager at J Coffey Construction, said:

“CEVO Digital from Tarmac is a fantastic example of how technology can support lower carbon construction. Using CEVO Digital alongside lower carbon mixes allows us to maximise efficiency and make real-time decisions based on live performance data. It’s all about giving clients what they need today while being ready for what they’ll need tomorrow.”

Looking Ahead

The Oxford Science Park development demonstrates how pairing CEVO lower carbon concrete with digital strength monitoring and AI-driven optimisation can accelerate the transition to lower carbon construction. By combining material innovation with real-time data and predictive modelling, the project shows how digital tools can remove uncertainty, reduce carbon at scale, and support the delivery of sophisticated scientific and commercial infrastructure.

This project reflects Tarmac’s continued commitment to developing practical, technology-led solutions that reduce embodied carbon, improve material efficiency, and enable customers to achieve their sustainability goals with confidence.