

“We’re proud to be at the forefront of innovation in the industry, meeting our customers’ needs for sustainable solutions and accelerating progress towards a net-zero built environment. Together with MMB and Hyperion Robotics, we’ve unlocked new opportunities to embrace exciting new 3D-printing technology and remote construction techniques for Yorkshire Water.”

Nick Toy, senior national commercial development manager at Tarmac

Solutions

**NET
ZERO**

Sustainable Construction

3D-Printed Concrete

Tarmac teamed up with Finnish technology company Hyperion Robotics to bring structural 3D-printed concrete to the UK. In partnership with fully-integrated design and build company, Mott MacDonald Bentley (MMB), and Yorkshire Water, the innovation has been brought to life in a 3D-printed concrete design to replace standard applications for a major project at Yorkshire Water’s largest sewage treatment works in Esholt, near Leeds.

Following Yorkshire Water’s inaugural net zero partner event in January 2023, lead contractor MMB joined up with Hyperion and Tarmac to explore the latest sustainable construction solutions and techniques. As a result, four bespoke drawpits – traditionally heavy, box-shaped structures placed underground for the containment of electrical cabling – have been designed and put in place at Esholt thanks to the new robotic technology.

The drawpits, which meet Eurocode standards for structural engineering, have been positioned to allow for cabling to be installed from a new motor control centre leading to a set of newly refurbished deep bed sand filters and the site’s backwash pumping station. Together, the equipment combines to control and ensure high-quality water filtration on-site.

The 3D-printed design has resulted in a 40 per cent reduction in embodied carbon when compared to a conventional, in-situ drawpit.

Nick Toy, senior national commercial development manager at Tarmac, said: “When structurally designed 3D-concrete printing is combined with dry silo mortar factory production methods and the latest low carbon cement technology, this new model offers multiple benefits.

“By continuing to provide expertise to Hyperion, we’re excited to build on key learnings from the project and



explore how 3D-printing technology could be extended across the wider construction industry.”

Serving 760,000 people in Bradford and Leeds, Esholt Waste Water Treatment Works is undergoing a capital improvement programme in a bid to reduce the amount of phosphorus present in treated wastewater. The initiative forms part of Yorkshire Water’s commitment to excellent environmental performance – ensuring effluent water quality meets and exceeds the most stringent requirements.

Marc Lupton, capital delivery programme manager for Yorkshire Water, said: “This pioneering piece of technology allows us to reduce our carbon footprint and has the opportunity to replace our traditional methods of construction.

“It’s exciting to see this 3D concrete printed structure and we are looking forward to seeing how we can develop further applications for expanding its use across our Capital Programme. We’d like to thank MMB, Hyperion Robotics and Tarmac for the work they have put in to bring this together. “We are always looking at innovative new technologies to help us reduce our carbon footprint as we continue our journey to net zero.”

Tom Lewis, MMB operations director, said: “Innovative ways of working are at the core of how, as a business, MMB commit to deliver both low carbon and low-cost solutions for our clients. It has been a pleasure for our teams to collaborate in such a fast-paced way to bring these solutions to life and we look forward to the continuing partnership bringing even greater gains.”