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Largest ever UK pour of carbon-reducing concrete on Euston station site by HS2

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The largest ever UK pour of carbon-reducing concrete has been completed on the HS2 Euston station site.

A total of 232 m3 of Earth Friendly Concrete (EFC), a material that reduces the amount of carbon embedded into the concrete, saving over 76 tonnes of CO2 overall, was poured at the site by John F Hunt, working for HS2's station Construction Partner, Mace Dragados Joint Venture, in early September.

The EFC product, supplied by Capital Concrete, has been used to create a foundation slab that will support polymer silos used for future piling works at the north of the Euston station site. Whilst the foundation is temporary, it will be in use for two years, and historically would have been constructed with a more traditional cement-based concrete.

Earth Friendly Concrete is made from a combination of ground granulated blast furnace slag, pulverised fly ash and a high-alkaline chemical, rather than Portland cement. Its geopolymer binder system reduces embodied carbon by around 70% saving 250kg of CO2 per cubic metre poured.

The use of the product on this scale represents an important step forward in how innovative

environmentally sustainable products can be used in construction. The project also supports HS2's objective of net-zero construction by 2035 and helps achieve its goal of halving the amount of carbon in the construction of Britain's new high speed rail line.

Mark Fenton, carbon manager at HS2 Ltd, said: "HS2 is at the forefront of adopting new technologies to reduce the environmental impacts of construction, and is on its way to achieving a 50% reduction in carbon emissions compared to traditional construction methods. Whilst there have been a lot of examples of using low carbon concrete across the project, the scale of its use at Euston station is a huge step forward in us understanding how it can be used more widely in construction going forward, reducing environmental impact for generations to come."

Ben Wheeldon, programme director at Mace Dragados Joint Venture said: "This largest ever UK pour of earth friendly concrete is symbolic of the ambition we have at Euston to get our carbon emissions down at every possible opportunity. This project is a hotbed for innovation, not just in the decarbonisation space, but generally, and we're making sure of that by bringing on board the right supply chain partners and encouraging them to be bold with their solutions."

Martin Needham, John F Hunt's senior project manager, said: "Our ambition is to reduce carbon emissions during construction at every possible opportunity. The pour to create the temporary slab at Euston was the perfect opportunity to utilise the cement free, Earth Friendly Concrete.

"We chose to use the EFC, not only for the over 70% saving in embodied carbon, but also for its excellent characteristics. It has an increased tensile strength, enabling thinner slab designs and therefore a reduction in overall volume of both concrete and reinforcement."

In addition to the application of EFC, innovative thinking and collaboration saw the use of 20-yard skips instead of the standard concrete thrust blocks for the temporary works design during the process to remove a retaining wall. This alone resulted in a saving of 30 tonnes of CO2. John F Hunt also used GreenD+ Hydrogenated Vegetable Oil (HVO) for all site vehicles instead of diesel, saving around 29 tonnes of CO2.

Elsewhere on the Euston site, the HS2 and MDjv team have adopted a number of measures aimed at reducing the environmental impact of construction, including the use of liquefied petroleum gas generators as a direct replacement for diesel generators, and using a new piling method that will provide heating for buildings above.