

CASE STUDY

PULVERISED FUEL ASH (PFA) USED IN AWARD-WINNING ROAD IMPROVEMENT SCHEME

A £65 million scheme to tackle a notorious traffic bottleneck in Reading – Junction 11 of the M4 – was named the overall winner at the 2011 Institute of Civil Engineering's (ICE) Thames Valley Excellence Awards.



The scheme, which also won the large projects award, used PFA from RWE's Didcot A power station to lessen the impact on the environment.

Work started in April 2008 on the project, which was needed to reduce congestion caused by the sheer volume of motorway users and through traffic at rush hour. Junction 11 is where the A33, a major route in and out of Reading, intersects the M4. As well as the junction itself, the scheme was designed to improve surrounding roads in the area, including the Mereok roundabout and part of the A33 Swallowfield Bypass in Shinfield.

PFA as fill

The scheme required the construction of a new four lane motorway junction, as well as two new road bridges around the existing junction and two new junctions south of the M4

at Mereok. Carriageways were reconstructed and a separate bus lane, cycle and pedestrian access were also introduced.

To widen the interchange at the existing junction, a new eight metre high embankment was required and PFA was selected as the suitable engineering fill material to achieve the necessary contouring requirements.

Why PFA?

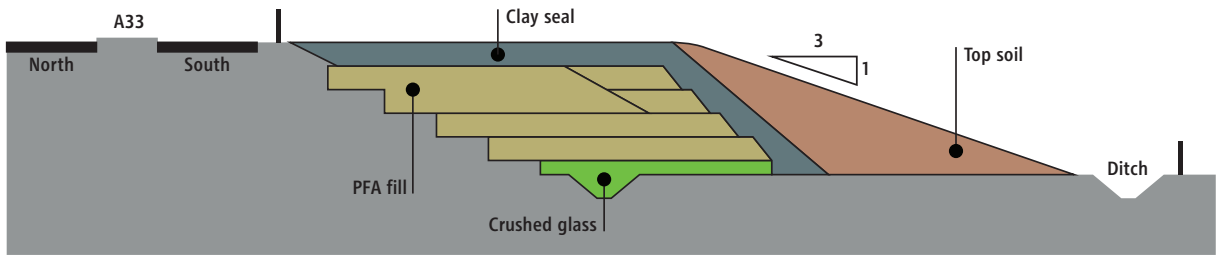
The contractor for the project, Laing O'Rourke Infrastructure, was appointed by Reading Borough Council in March 2008. Considerable emphasis was placed upon the importance of the project's 'green' credentials, with materials sourced to meet the exact amount required for the job, ensuring minimal wastage.

PFA is a lightweight fill material with low permeability and some self-hardening properties. Utilising

PFA in construction projects is one of the most sustainable uses of the material and by avoiding the need to excavate and utilise primary aggregates, construction companies can reduce the environmental impact of their projects.

Clay was originally considered as an alternative for the eight metre embankment but following discussions with the contractor, RWE Power International was able to demonstrate the suitability of PFA as an engineering fill, in particular by highlighting its successful use in other projects and because of its cost and ready availability.

PFA was also preferred for this project as it is not as susceptible to bad weather, so construction of the embankment could take place during winter.



Typical cross section of south east embankment

At the base of the embankment, which was the largest required for the project, a drainage layer of recycled crushed glass was installed, with the PFA sealed by a layer of clay on the top and the face of the embankment.

The majority of materials used for the project were procured from local companies, reducing harmful carbon emissions generated by

long distance transport. In total, 85,000 tonnes of conditioned PFA, ie PFA that had been moistened with water prior to delivery, was supplied from nearby Didcot A power station over a period of ten weeks. The remaining motorway junction remained open during works to reduce disruption for the duration of the project, which was completed in August 2010.



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