

CASE STUDY

CONTRACTOR WITH NO PREVIOUS EXPERIENCE FOUND PULVERISED FUEL ASH (PFA) TO BE AN EASILY MANAGEABLE SECONDARY AGGREGATE

The contractors responsible for the construction of a new 2.5km bypass to reduce the impact of heavy traffic on the Bedfordshire village of Ridgemont were faced with a difficult challenge – how could the environmental impact of the project be reduced?



In order to alleviate problems caused by heavy road traffic passing through Ridgemont in Bedfordshire, a new 2.5km bypass was planned for the village.

To complete the scheme, it was necessary to construct two embankments for a new rail bridge crossing the existing railway in the area.

Traditionally, a primary aggregate would have been used for such a task. However on this occasion, to minimise the 'green' cost of the project, PFA was chosen to construct the embankments. The properties of PFA make it ideal for use as engineering fill, avoiding the extraction of primary aggregates and thus reducing the overall environmental impact.

Environmental advice

The principal contractor approached RWE Power International for help with negotiations with the Environment Agency (EA). Birse was required to register an exemption under paragraph 19a of the Waste Management Licensing Regulations to enable the use of PFA. Discussions with the EA involved the presentation of data from RWE npower's Central Ash Laboratory, detailing the

composition and fineness of the PFA, as well as the results of leaching tests and a demonstration of cohesion, compaction and permeability properties. Subsequently, it was agreed that PFA was suitable for use and posed no risk to humans or ground and surface water courses.

PFA as fill

The earthworks sub-contractor, Kane Plant Hire, was cleared to use PFA in the construction of the embankments. As the project progressed and Kane became accustomed to using the material, demand increased and delivery amounts peaked at about 2,000 tonnes per day, with supply coordinated by RWE Power International from RWE npower's coal-fired power stations.

In line with RWE Power International's usage recommendations, PFA was placed onto a single base layer of sand (~300-450mm) and then covered with a geotextile membrane. The PFA was then graded to a maximum of 225mm using a Caterpillar D6 bulldozer, sprayed with water and then compacted by a number of passes with a Bomag vibrating roller. Layers of PFA were built up in this manner. The in-situ density

of PFA was monitored by regular site testing. The recommended target of the maximum dry density is 95% (theoretical density of material with minimum voids). When the desired depth of PFA was achieved, a 100mm thick layer of sub-base material was applied (where a road was to be constructed to the top of each embankment), or 100-150mm of topsoil was applied (where the surface was to be landscaped).

In total, 140,000 tonnes of PFA were supplied over a period of a year – peak input was 8,700 tonnes a week.

Speaking of the use of PFA as a greener alternative to primary raw materials, RWE Power International's Dave Catley said, "PFA is a cost effective and sustainable fill material which worked well in this project. As part of the RWE Group, we have the technical support on hand to ensure projects such as this run smoothly."

Commenting on its use of PFA on such a scale for the first time, Andy Kane of Kane Plant Hire said, "Initial concerns relating to the use and suitability of PFA were eliminated. The use of PFA contributed to the overall success of the project."



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