CASE STUDY

PULVERISED FUEL ASH USED IN ONE OF WALES’ LARGEST TRANSPORT PROJECTS

During 2012, Generation Aggregates supplied Pulverised Fuel Ash (PFA) from Aberthaw Power Station to Harbour Way – Wales’ largest transport project since the creation of the M4.

Work started in 2011 on the scheme, which will ultimately provide a new 4.8km dual carriageway to link Junction 38 of the M4 to Port Talbot and the Docks. The new road will provide a vital link to West Wales, the UK motorway network and mainland Europe.

Known as the Port Talbot Peripheral Distribution Road – or PT PDR – the route of the road passes through some areas of previously contaminated land. Site investigations identified the need to remediate some shallow soils that had been significantly affected by Naphthalene, an organic compound toxic to humans by inhalation, ingestion and skin contact.

Soil stabilisation was selected as the most technically robust, cost-effective and sustainable solution for the contaminated area, especially as this approach would enable the treated soils to be retained and reused on the site.

Why PFA?

Soil stabilisation is a way of recycling and strengthening contaminated soils in-situ, ensuring that they reach the levels of strength and stability required for structural fill. PFA, produced as a by-product of coal-fired power generation, is ideal for this process, due to PFA’s pozzolanic and self-supporting properties providing increased stability and strength.

Neath Port Talbot Council and Costain, the main project contractor, appointed specialist contractor Vertase FLI to undertake the remediation work. A detailed treatability trial established the preferred reagent application rate for a mixture of PFA and Ordinary Portland Cement (OPC) that was effective at chemically and physically stabilising the contaminated soils. The trial was highly successful and naphthalene leachate concentrations were reduced to at, or below, laboratory detection limits.

The reagent – a mixture of Pulverised Fuel Ash (PFA) and Ordinary Portland Cement (OPC) – was spread across the surface of the contaminated soil.
Ground Granulated Blast Furnace Slag (GGBFS) was assessed as an alternative to PFA for the mixture. However, PFA was selected as the most effective reagent in terms of cost and more importantly, sustainability, a key driver for the project.

PFA in construction projects is one of the most sustainable uses of the material. By avoiding the need to excavate and use virgin aggregates, construction companies can reduce the environmental impact of their projects. Generation Aggregates was able to highlight PFA’s successful use in other projects, its cost in comparison to alternative materials and its ready availability from RWE Npower PLC’s nearby Aberthaw Power Station.

During August and September 2012, Generation Aggregates supplied 800 tonnes of PFA for the soil stabilisation process. The contaminated soil was successfully placed, treated and compacted to form the base of a new road embankment.

Overall completion of the project is scheduled for Autumn 2013.

Speaking about the use of Pulverised Fuel Ash, Chris Piddington, Project Director at Vertase said, “For this project, PFA definitely worked best for us, both in terms of cost and from a sustainability angle. The fact that we could have PFA delivered from Aberthaw when we needed it was a big advantage and helped to contribute to the success of this element of the scheme.”

Following a successful treatability trial, the contaminated soils were stockpiled on site prior to treatment.

The reagent was mixed with the contaminated soil in-situ.