

## Shared Learning Environment & Sustainability Sustainable Construction

*IP Great Western & Crossrail Region – The Greater West Programme*

### OLE England (Compounds & Road Rail Access Points)

Amey Inabensa/Geotech Soil Stabilisation

#### Project Overview:

Building and operating compounds and Road Rail Access Points (RRAP) within the Thames Valley Area of the Greater West Programme in order to deliver the electrification works

#### Summary:

- Approximately 30% cost saving against traditional methods
- Construction time reduction
- Vehicle movements reduction
- Aggregate import reduction
- Post scheme soil regeneration
- Maintenance free

#### Planning & Delivery

Amey Inabensa has been contracted by Network Rail to deliver the electrification works in the Thames Valley Area. This package of works includes building and operating a significant number of compounds, and associated Road Rail Access Point (RRAP) when required, from Maidenhead to Bristol, Chippenham and Newbury in order to provide railway access, OLE material storage capacity and welfare facilities over a period ranging from 1 to 3 years.

The construction of a compound, most commonly on agricultural land leased by Network Rail, requires the removal of a layer of topsoil (typically 300 to 500mm depending on ground conditions) stored on site for reinstatement and the import of aggregates (typically 4,000 tonnes for a 5,000m<sup>2</sup> compound) to build a load bearing layer able to accommodate the movements of heavy machinery and the storage of heavy material and welfare cabins.

The land agreement between Network Rail and the landowner requires that the land is returned to its original state (i.e. aggregates removed and topsoil reinstated). As a result, the imported aggregates become waste if a solution for reuse could not be identified before the demobilisation stage. Leaving

the compound in place is not permitted unless the landowner has obtained a planning permission from the local authority for change of land use.

In order to overcome some of the constraints associated with land reinstatement as well as reducing construction time and costs, Amey Inabensa approached Geotech Soil Stabilisation (GSS) to discuss an alternative solution using a binder with similar properties to cement: Geobind. The product is mixed with the soil transforming the site into a load bearing surface. During reinstatement, the surface is broken up and sodium bicarbonate added into the soil to correct the pH and return the land to its original state.



#### Results & Benefits

Using this innovative approach to compounds construction at 6 locations on The Greater Programme, Amey Inabensa reduced the import of aggregates and their associated disposal by 50 to 75%. It also significantly reduced the number of lorry movements to and from site by 40%, minimising the safety risks and nuisance impacts of heavy deliveries on the local community. Carbon emissions associated with transport of material for the construction of the compounds was also reduced, with savings ranging from 10 to 70%, mostly depending on the distance to the Geobind manufacturing location in Portskewett, Caldicot (South Wales). Finally, this solution achieved an average 30% cost reduction, for a total saving estimated to be approx. £1 million. See breakdown of environmental and financial benefits below.

Another benefit of the Geobind solution is the reduced maintenance requirements against conventional stone designs.

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Compound	Surface area (m <sup>2</sup> )	Lorry movements reduction* (number of journeys)	Transport carbon reduction* (tonnes of CO <sub>2eq</sub> )	Aggregates import & waste reduction* (tonnes)	Estimated cost saving*** (£)
Milley Bridge	13287	255	7	3985	239166
Padworth	10266	195	9	3080	184788
Poole Farm	11450	220	6	3435	240450
Langley	4927	95	15**	1480	88686
Froud's Lane	9187	175	0.6	2755	165366
Whitegates	3563	70	0.6	1070	64134
<b>Total</b>	<b>52680</b>	<b>1010</b>	<b>23.2</b>	<b>15805</b>	<b>982590</b>

\*Based on 400mm traditional stone layer, 100mm Geobind armoured stone layer and 1.5t/m<sup>3</sup> aggregates density

\*\*High carbon saving due to the proximity of Geobind factory and longer distance to stone supplier/disposal site

\*\*\*Based on £60,000 average cost for building 1000m<sup>2</sup> of compound using traditional stone design and 30% average saving achieved using Geobind