

Lafarge Aggregates

Greening Liverpool's regeneration

Recycled asphalt advocate Liverpool City Council recently called on Lafarge Aggregates to surface its newest car park with high performance secondary materials to a tight deadline.

Liverpool's status as European Capital of Culture in 2008 has made additional funding available for regeneration of the city's infrastructure – including the road network. Despite previous performance problems, Liverpool City Council (LCC) is planning to use recycled surfacing materials wherever it can in a bid to meet its recycling targets.

Car parks are no exception to LCC's green policies and Lafarge Aggregates has just surfaced a new 4000m² car park using recycled material topped with a conventional surface course. Lafarge specially designed the Axofoam mix to use recycled asphalt plantings (RAP) stockpiled by LCC, and to have a high early life strength which enabled the work to be completed in just two days.

"LCC has not had a long history of using recycled asphalt materials, but in the last couple of years it has pursued a more sustainable approach to road construction," says Lafarge Aggregates National Asphalt Development Manager Jim Wilson. "Several recent recycled surfacing projects

create a more engineered product with predictable end performance. The Axofoam technique has been successfully used on a number of different grade roads in Norfolk, and LCC awarded the car park contract to Lafarge on the basis of its good recycling track record.

"Design of the Axofoam mix is always adjusted to suit the recycled material available and maximise end performance." Jim Wilson

carried out by other contractors for LCC have suffered from rutting failures. But rather than being put off by the technique, the council has become more determined to find a better solution."

Lafarge has developed its ex situ recycling Axofoam system for Norfolk County Council over the last two years to

Axofoam is created by mixing crushed RAP with foamed bitumen, which is formed by injecting cold water into straight run 100 to 125 pen bitumen using a specially designed spray bar just before mixing. Foaming expands the bitumen's volume by up to 15 times, which increases its surface area and significantly reduces its viscosity, allowing it to effectively coat the aggregate.

"Foamix asphalts have been available for some time but they are often viewed as a cheap and cheerful option with lower end performance than conventional materials," says Wilson. "But in reality it can perform as well as conventional materials if the design is right."

Most of Lafarge's recycling work in Norfolk involved planing material from a road and taking it away to its Higham asphalt plant for screening and mixing with foamed bitumen. But at the Liverpool site Lafarge brought in a Wirtgen mobile crushing and recycling plant to mix the RAP and foamed bitumen on site to speed up the work.

"LCC wanted the surfacing to be completed in two working days so we had to



Access to the Liverpool car park site was limited and work had to be carefully sequenced.



Lafarge brought in a mobile mixing plant to create the Axofoam asphalt on site.

design a stiff recycled mix which would 'cure' quickly enough to be overlaid by the surface course within 24 hours," says Wilson. "Design of the Axofoam mix always has to be adjusted to suit the recycled material and maximise the end performance."

Laboratory analysis of LCC's stockpiled RAP enabled Lafarge to refine its design before reaching site, and the early life stiffness of the material was increased by adding cement to the mix. According to Wilson this was key to the success of the project. "If the material took too long to 'cure' it would have been too soft to lay the surface course within the specified time," he says. "The binder course would become rutted by the paving machine if the mix had not gained enough strength before we laid the surface course."

The LCC car park on which Lafarge was working is used by LCC's term maintenance contractor Liverpool Enterprise, and was a new build project to provide car parking for new offices. "Part of the site was covered by concrete and the rest had been levelled using MOT Type 1 materials, but being a new site we did not have to organise traffic management," says Lafarge Contracting Contracts Manager Ernie Sciarriolo. "Nonetheless, access to the site was limited and the work had to be carefully sequenced to maximise efficiency

of the surfacing team and to get the joints in the right place."

Lafarge laid a 100mm thick layer of Axofoam at the site, formed using 28mm nominal sized RAP, cement and foamed bitumen, overlain by a 35mm layer of Axophalt HD surface course. "The work went extremely well," says Sciarriolo. "Even the very hot weather did not impact on the surfacing programme."

LCC must have been pleased with the outcome of the contract as it has just commissioned Lafarge to carry out another two surfacing projects which include

recycled binder courses.

Lafarge is pleased that the environmental benefits and high performance of Axofoam is gaining widespread recognition but, according to Wilson, the company is looking to develop the technique further. "We are always trying to build on our existing knowledge and we are currently investigating the influence of foaming and wetting agents," he says. "Plus we are also planning to look at the potential for using alternative types of bitumen."

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Lafarge designed the Axofoam to have a high early strength to enable the project to be completed in two days.