

## Hanson Aggregates

# Rail ballast rethink

Huge volumes of spent railway ballast are being reprocessed for use in asphalt by Hanson Aggregates in Oxfordshire.

Secondary aggregates used to produce sustainable asphalt materials typically account for no more than 30 or 40 percent of an end product. But Hanson Aggregates has taken the concept of material reuse one step further by manufacturing durable asphalt that contains 100 percent reused aggregate.

The materials specialist is using spent railway ballast, excavated from beneath railway lines throughout central and southern England, to produce a variety of asphalt products. The ballast is crushed and screened to remove impurities, mixed with straight run bitumen and used to manufacture a range of base, binder and surface course mixes.

Railway ballast is deemed as spent when it can no longer adequately support sleepers, track and passing trains. Over time, ballast loses its angular characteristics, attracts aggregate fines and the mechanical interlock between ballast becomes less effective. Spent ballast, though, remains a hard and durable aggregate and as such is a thoroughly suitable substitute for virgin limestone used

in the manufacture of asphalt.

Hanson Aggregates receives around 50,000t of spent railway ballast every year, delivered to its railway sidings and asphalt production facility at Appleford in Oxfordshire. Ballast is supplied to Hanson under contract with materials distributor Midland Quarry Products.

smaller than 25mm in diameter and larger than 100mm was removed and the ballast was crushed into six sizes, from 28mm down to dust. Hanson then fed the aggregate into the site's asphalt coating facility.

Four fifths of the material brought to site is ballast and can be reprocessed for use in

**"Asphalt produced using ballast performs very well and material laid on a stretch of road on site has stood up well to use by heavy goods vehicles"** Brian Bell

Spent ballast is collected from various locations on the railway network and is comprised of several different rock types, predominantly igneous. Rail mounted freight wagons deliver material to Appleford and their contents are unloaded using an excavator with a grab bucket.

Hanson used the ballast at first to produce low grade materials with relatively little value, such as sub base and fill, but last summer decided to make better use of the stone. It called on its recycling subsidiary John Mould to crush and screen 30,000t of ballast at the sidings. Material

asphalt. The unwanted material includes soil, concrete sleepers, steel rails and demolition waste and is screened out and taken away for recycling off site or to landfill.

This year to date, over 7000t of asphalt has been produced using spent railway ballast, with a forecast of over 56,000t by the year end. Materials such as 28mm base, 20mm binder course and a 10mm close grade surface course are commonly produced at the facility. Clients range from individuals looking for small quantities of asphalt at short notice up to construction and laying companies with highway maintenance contracts.

Hanson's development of asphalt using spent ballast has been driven by the site's Unit Manager Brian Bell and Technical Officer Brian Mills. Together, the pair have turned what was a good idea from a concept into a successful operation.

"We realised that the ballast being brought to site could be put to better use and decided to exploit what we saw as a

Around 50,000t of spent railway ballast is delivered direct to Hanson's Appleford site by rail each year.





Hanson's Appleford asphalt plant is probably the only one in the UK producing asphalt with 100% reused aggregate.

niche in the market," says Brian Bell. "To our knowledge, no one has ever before produced an asphalt that incorporates 100 percent reused aggregate.

"Asphalt produced using ballast has performed very well to date and material laid on a stretch of road on site has stood up well to use by heavy goods vehicles."

So confident is the company with using spent railway ballast to produce asphalt that it has significantly reduced supply of imported limestone to Appleford. All asphalt formerly produced with limestone contains only spent railway ballast.

There are no guarantees as to the frequency with which ballast arrives at Appleford sidings, as this largely depends on how often maintenance is carried out on the railway network. The company's supplies of spent ballast are adequate in the short term but according to Bell, demand for asphalt containing spent ballast is growing in line with customers' confidence in the material. "We had a good year of importing rail ballast in 2003, but in the

medium to longer term we will need to receive more ballast to keep up with demand," he says.

Prospects for future supply of spent ballast though look good, as track maintenance companies increasingly look to renew railway ballast to comply with higher quality standards introduced recently. Mills says: "Track is increasingly being used by heavier, faster and more frequent trains. This leads to ballast wearing more quickly. The specifications for the suitability of railway ballast became more onerous a couple of years ago which has also increased maintenance frequencies."

Future demand for asphalt containing spent railway ballast is likely to be driven by three factors. For one, rail maintenance companies can dispose of spent ballast in this way without sending it to landfill. Secondly, Hanson can import and process spent ballast for marginally less than it costs to buy in virgin aggregate from the south west of England. And for material specifiers, asphalt produced using ballast is exempt from the levy on primary aggregate extraction.

Bell adds: "Local authorities are under increased pressure to use secondary or reused materials and we hope that many more will jump at the chance of specifying road materials that use spent railway ballast."

**email hotline:** [info@modernasphalts.com](mailto:info@modernasphalts.com)

Spent ballast is unloaded from rail mounted freight wagons using an excavator grab bucket

