

# Hanson combines strengths for tough duties

A new surfacing material combining the flexibility of asphalt with the strength of concrete has been launched for heavy duty applications by Hanson Aggregates.

Renewing surfacings is a disruptive process if conventional concrete is used and has to be left for up to a week while the material gains sufficient strength. Asphalt can be trafficked far quicker and without the movement joints that often cause concrete pavements to fail. Concerns over asphalt's resistance to particularly high stresses however, has led Hanson Aggregates to develop a new specialist surfacing.

The material is known as Flexicrete and is an innovative mix of asphalt and cementitious grout. It is said to demonstrate

a similar strength to concrete, with the flexibility of asphalt and the material has also been designed to resist damage from fuel spillage.

Flexicrete is officially launched by Hanson this year, but the surfacing has already been laid on a series of bus lanes in northern England. Those behind its development now hope to persuade port authorities to specify the surfacing for worn approach roads and hardstandings used by heavy lorries.

Fully laden HGVs weigh up to 44t and exert heavy stresses on a road surface or hardstanding when turning sharply. Hanson

claims that Flexicrete can provide a strong and highly durable repair to worn surfacings used by freight. The company is also looking to introduce the material to airport operators for use on worn taxiways and aprons.

Laying Flexicrete is a two stage process. First of all, an open textured asphalt with a high void content of around 25% is laid and compacted to a depth of 40mm. The material is left to cool to around 30 degrees before a free flowing cementitious grout is poured over the asphalt and levelled using hand tools to fill the voids. The surface can be laid swiftly and trafficked soon after.

Hanson Aggregates' product development manager Steve Southam says: "Flexicrete has the same compressive strength as a high grade concrete, is very quick to lay and can be trafficked within 24 hours. The strongest of asphalts have until now been suitable for all but the most rigorous applications but the use of free flowing grout gives the material the additional strength needed to be used anywhere."

Hanson developed the free flowing grout for use in Flexicrete in association with the admixture producer Sika and the cementitious powder specialist ScotAsh. Bags of dry grout containing cement and a polymer additive are brought to site and mixed with water in a mobile plant. Colour can be incorporated into the material simply by adding coloured pellets or dye during the mixing stage.

Senior technician Sean Halstead of Hanson Aggregates says: "The grout is self levelling and has been designed to penetrate pervious asphalt to full depth. Any surface voids that remain after an application of



Flexicrete has been laid on a series of bus lanes in northern England



Normal road surfacing sample before being soaked in petrol



Normal road surfacing sample that has been soaked in petrol for 15 days



Flexicrete road surface sample before being soaked in petrol



Flexicrete road surface sample that has been soaked in petrol for 15 days

grout can be filled in straight away by operatives using hand tools."

The asphalt component of Flexicrete is referred to as the support coat and is comprised of single sized aggregate with a high polished stone value and straight run bitumen. A range of different stone can be specified, such as a dolerite basalt from Wales or a granite or a gritstone from Scotland.

Hanson carried out preliminary trials of Flexicrete on a private lorry park and took 150 cores for analysis. Heriot Watt University was asked to test cores for fatigue resistance and Hanson carried out wheel tracking, stiffness and fuel resistance tests at its laboratories at Criggion Quarry.

Heriot Watt University can also carry out a complete design for a road rebuild. It will conduct plate bearing analysis on a sub base and design a road to include a Flexicrete surface course.



Flexicrete is laid swiftly in a two-stage process

Fuel resistance testing involved immersing cores of Flexicrete in petrol and diesel for two weeks and weighing them each day to test for material degradation, alongside control samples of conventional 20mm hot rolled asphalt. Results of the trials showed that although the outer surface of the Flexicrete had been attacked by the fuel, the cores had retained their integrity and fared far better than the control samples which had all but been destroyed.

**"Laying Flexicrete is no more labour intensive than laying asphalt."**

Steve Southam

Site trials of the new surfacing were carried out in the spring of 2004 at Whatley in Somerset and at Criggion Quarry in north Wales and led to a first contract on a bus lane at Oldham in Lancashire. Oldham council asked Hanson to supply a durable surfacing to replace cracked and crazed asphalt and required a red pigment to be incorporated into the material to clearly mark out the bus lane from the public highway.

The material in Oldham has been down for over 12 months, continues to perform very well and the client is apparently keen for further use of the material in the town.

Hanson Aggregates' Steve Southam says

that the material is easy to lay: "Laying Flexicrete is no more labour intensive than laying asphalt. It does not take too much compacting and requires only two or three passes of an 8t roller. The surfacing achieves good early strength."

"We can either crack and seat a failed concrete pavement, apply a new binder course with Flexicrete as an overlay, or it can be laid over an existing surface. Flexicrete can also be used in new-build situations."

Southam adds that the development of Flexicrete was a logical step for Hanson's Construction & Major Projects Division, which had been laying asphalt support coats before specialist contractors applied a grout. "The quality of grout applied to Hanson's support coat would vary between sites. We decided to look closely at the design of the material, develop a grout with Sika that was consistent and carry out the whole laying process ourselves," he says.

He adds that there is a huge market for Flexicrete as a means of providing long lasting repairs to surfaces that otherwise have to be replaced every few years. "Key advantages of the Flexicrete system include the fact that it has a similar strength to concrete but does not have joints that can be a weakness with concrete applications. It can also be trafficked again within 24 hours."