Nynas Bitumen

Sustainable paving system sees Scottish launch

Tayset asphalt paving – introduced this summer to political acclaim – has impeccably 'green' environmental credentials not least through its use of cold mix binder technology from Nynas Bitumen.

One of Scotland's biggest and most high profile product launches took place in June this year when the sustainable asphalt paving system Tayset was demonstrated at Collace Quarry, Perthshire. A product of Scottish contractor Tayside Contracts, Tayset is a cold mix asphalt made with recycled construction waste that can replace hot mix materials in base and binder courses. It was acclaimed at its launch by Scottish Finance & Sustainable Growth Secretary John Swinney for the economic and environmental benefits it is likely to bring.

Tayset has been developed in a three year Knowledge Transfer Partnership between Tayside and Dundee University. Bitumen specialist Nynas, one of whose refineries is in Dundee, provided significant input. The object was to produce a greener and cleaner asphalt with a low carbon footprint, particularly in terms of energy consumption and emissions. It would recycle waste and cut material sent to landfill. But Tayset would also be an asphalt capable of performing in demanding, high value applications.

Swinney described Tayset as unique and paid tribute to those who had developed the material. "It has the potential to produce savings of over £6M per year when compared with traditional asphalts...I am in no doubt that if contractors use this new system more widely, we will significantly reduce landfill and help contribute to making Scotland a greener place in which to live."

The launch event was well attended by Transport Scotland engineers, heads of service from local authority roads departments, people from the utility sectors, consultants and journalists. (The event was later featured on BBC news.)

Tayside Contracts Managing Director Iain Waddell gave the background to his own works organisation began the £1.1M car park towards the end of 2007 with asphalting taking place in March and April this year.

The car park is very much a low energy test bed. Apart from its recycled, low emission asphalt, the facility's lighting is able to be dimmed when not needed; and its passenger waiting and lavatory building is ecologically friendly, with timber construction, ground source heat pumps, photovoltaic cells and sun pipes.

A GREENER SHADE FOR STIRLING CAR PARK

Tayset, the cold mix asphalt with recycled planings, has been extensively tested prior to its launch. Its principal use, to date, is in the Western Park & Ride car park of Stirling Council in Scotland, opened in August. "What may be described as 'green considerations' are an increasing part of the equation for us, in the way we work," says Stirling's Roads Divisional Engineer Kenny Snedden. "We were keen to trial Tayset in a particularly tough application to see how it would perform over time."

Stirling decided to specify Tayset in part of the car park's access road and the turning circle for buses – the road is relatively heavily trafficked and the turning circle particularly tight. The unspoken implication is that if Tayset withstands the weight and lateral thrust imposed by the park and ride buses, it will survive anywhere. Stirling's

An onerous testing ground for Tayset – the bus turning circle

An enthusiastic group of politicians, road authority engineers and contractors watched the Tayset demonstration

company's commitment to sustainable construction and how Tayset had come about.

"When Tayside started to look at the development of a sustainable road paving system, we realised that we did not have all the necessary skills and facilities available in house," Mr Waddell said. The Knowledge Transfer Partnership, where the different areas of expertise of business and academia are brought together for mutual benefit, was seen as the way forward; and it did not take Tayside Contracts long to decide that the University of Dundee should be its academic partner.

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John Swinney

"There is another partner, Nynas, our bitumen supplier. We have partnered with them for many years to the benefit of both organisations. Without their assistance we would not have achieved Tayset."

Depute Director (operations) Richard Cranney described what a move to cold mix technology could mean to Scotland, in terms of environmental impact. Some 500,000t of asphalt planings could be used, with an estimated 15% reduction in the cost of traditional material. "The saving in CO_2 emissions is even more impressive with a potential reduction of over 17,000t annually."

A live demonstration of Tayset took place in Collace quarry, hosted by Tayside's quarry manager Grant Milne, a key player in Tayset's development.

Speaking after the event, Grant Milne said: "The response to Tayset's launch was very positive, very enthusiastic. When our guests could see that we could remove waste, reprocess it and put it back to good use, all with very few emissions, they were very impressed. The launch and subsequent coverage has certainly made more people aware of what can be achieved."

Milne says that, for clients, Tayset ticks all the right sustainability boxes. The material is produced under tight quality control at Collace, which is a Sector Scheme 14 facility. Processed RAP (recycled asphalt planings screened and crushed to the right grading) is carefully mixed with bitumen emulsion specially blended for Tayside by Nynas.

"Tayset includes a variant of our Nyset product, a bespoke emulsion specially designed for cold mix applications. It is a well proven binder with a good history," says Nynas' Cold Paving Technology Product Support Manager Dennis Day. He makes the point that although Tayset is new and that cold mix asphalts for primary applications are beginning to be considered in Britain as a sustainable way forward, the bitumen technology has existed here since the early 1990s. "We have confidence in our emulsion and the way Tayside is using it in its cold mix."

The mixing of RAP and binder takes place at ambient temperature, says Milne. "The only heating required for the process is keeping the emulsion warm while it is stored. We have calculated that producing 1t of Tayset emits 10.4kg of CO_2 compared with the 34.4kg of CO_2 emitted while producing 1t of hot mix asphalt."

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