A338 Bournemouth Spur Road, Dorset

Project case study

Client

Dorset County Council

Product

Bespoke asphalt solution incorporating 20mm Tufflex HD with a 10mm stone mastic asphalt surface course

Volume supplied

46,000 tonnes

Overview

Hanson developed a bespoke, sustainable asphalt surfacing solution for the reconstruction of the A338 Bournemouth Spur Road, one of the first local authority projects of its type to be managed to BIM level two standards.

Project description

The reconstruction of the A338 forms part of a series of major transport and infrastructure investments around Bournemouth airport to drive economic growth, employment and development. Funding for the £22 million scheme was secured by Dorset Local Enterprise Partnership through the Dorset Growth Deal.

The innovative work was carried out through the Dorset Highways Strategic Partnership, a long-standing public/private sector collaboration between Dorset County Council and Hanson UK, which was established to deliver cost effective highways improvements in Dorset.

The scheme included full depth reconstruction of the dual carriageway; standardising carriageway widths; adding a one metre hard strip; replacing the central barrier; improving drainage to prevent flooding; addressing ecological issues and renewing road signs, cats eyes and markings.

To ensure the project could be delivered to BIM level two standards, world-leading project management technology was incorporated into Hanson's iPave tablet. This allowed all on-site information, photographs and project progress reports to be recorded and shared.

The A338 was built in the late 1960s and consisted of a concrete base, asphalt concrete binder course and hot rolled asphalt surface course. The concrete base had cracked, causing the surface to fail and resulting in a continuing maintenance commitment. The initial design idea of recycling the existing road materials was chosen as the preferred design solution. This was developed, trialled and evolved using foambase material to form the base course, with binder and surface course laid on top.

The decision to use foambase allowed 100 per cent of the old road materials to be incorporated, preventing some 70,000 tonnes of material going to waste or landfill and saving almost £1 million over conventional materials.

The original base course design layer thickness was 250mm but this was

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Infrastructure

reduced by 40mm as a result of the trial process, adjustments to the foambase design and the increased stiffness afforded by the use of Hanson's proprietary Tufflex binder course.

Although EME2 binder course was initially specified, a more sustainable material option was proposed using Hanson's 20mm Tufflex HD. This product produces stiffness levels comparable to those required for EME2 but with the added benefits of strength and flexibility while enhancing fatigue resistance.

This provided superior engineering properties for the challenging pavement design resulting in the ability to withstand heavy loading under extreme temperatures. In addition, the increased strength allowed the base layer depth to be reduced, saving over 16,000 tonnes of material and reducing vehicle movements.

By placing the premium binder in the binder course, rather than the surface course, long term maintenance costs are reduced as the surface course can be replaced in the future with conventional and less costly materials.

The original specification for the new road surface was hot-rolled asphalt (HRA) with coated chippings, but the project team suggested a thinner, more sustainable alternative. Dorset SMA was specially designed to provide long term durability through a carefully selected grading and enhanced binder content. The mix design resulted in a low void content and increased binder film thickness to deliver excellent durability, reduced noise and resistance to permanent deformation.

Replacement costs were also considered as HRA with chippings requires a two lane closure (in order to load the chipper), with a full closure or contraflow installation on the other carriageway. Laying volumes are also significantly reduced, as is sensitivity to weather. The like-for-like replacement with Dorset SMA removes these issues and the product can be installed at greater volumes with single lane closures, requiring fewer operatives and plant.

The project was completed on time and under budget and has been shortlisted for a number of high profile awards including Highways Excellence, Construction News and Chartered Institute of Ecology and Environmental Management Best Practice Awards.