

# CASE STUDY

## Type 2 Rural Link Road

'Pioneering technology using plastic waste to build roads, trialling in southern Scotland'

**Scheme:** A709 Lochar Bridge  
**Authority:** Dumfries and Galloway Council  
**Client:** Dumfries and Galloway Council  
**Date:** October 2017  
**In-Situ Process:** 300mm Deep Recycling  
**Surface:** HRA with MacRebur Plastic Pellets



BEFORE



BEFORE



BEFORE



PRE-PLANNED



CEMENT MIXING

Dumfries and Galloway Council's efforts to engage with SME's provides an opportunity to unlock cost effective, innovative and sustainable solutions to structural highway maintenance.

The A709 at Lochar Bridge is a section of carriageway between Dumfries and Lockerbie - a major route out of Dumfries heading east, with most of its HGV use by timber lorries.

The road was suffering from structural issues leading to extensive cracking and crazing on the surface. The underlying soft peat will have been a contributory factor to these failures as well as the impact of the established trees lining parts of the carriageway.

The proposed design was based on a Type 2 road therefore having a designed traffic loading of up to 5 msa over a theoretical design life of 20 years.

To confirm the make-up and suitability for structural recycling Stabilised Pavements undertook trialling in line with ADEPT Code of Practice for In Situ Recycling – in this instance 10 trial holes were dug (approximately 450x450x450m) in order to capture the grading, moisture content and underlying CBR values.

Trial logs were examined and the final design concluded prior to commencement – blended cement was added at a rate of 4% by volume and grid was specified as an enhancement to the whole area.

Over 3800 tons of carriageway material was pulverised and mixed with a blended cement binder over 5 days and installed at a depth of 300mm, providing a structural Hydraulically Bound Material, compacted and graded, finished with an emulsion spray to retain moisture within the curing HBM, and ready to receive a surface course.



In addition to the surfacing and as a result of the probable causes of the issues in the carriageway, particularly the impact of nearby trees and underlying peat, a composite grid re-enforcement was laid on the recycled HBM serving to enhance the performance of both the foundation layers and the surface course.

The asphalt surface overlay was laid at 60mm providing suitable cover in line with TRL design guides and also benefitted from modification through the addition of MR10 by MacRebur.

MacRebur's recycled plastic pellets were added to the asphalt as a structural enhancement improving the performance of the surface material and providing a perfect complement through its environmental benefits to the low carbon, zero waste process delivered by Stabilised Pavements through In Situ Recycling.

**CO<sub>2</sub> and resource efficiency report**

**Proud to be providing sustainable solutions.**