

## Ringway

# Elastic properties extend pavement performance

A rapid and reliable asphalt system is being used to repair roads with concrete bases and prevent reoccurrence of reflective cracking – Ringway's Flexiplast.

**D**amaged roads with concrete bases can be structurally repaired without recourse to the commonly used but generally crude and time consuming method of 'crack and seat'. This is evident from work this summer in Guildford in Surrey where Ringway has used its Flexiplast system to rejuvenate and resurface two such roads.

Road surface at each location was severely damaged – cracks permeating up through the asphalt layers due to cracking and movement in the concrete base below.

The conventional alternative to full depth reconstruction, crack and seat, involves exposing and cracking the concrete bays at controlled centres to create smaller slabs. These are then 'seated' into the existing granular sub base using a heavy pneumatic tyred roller before been overlaid with asphalt.

Flexiplast leaves the concrete whole and relies instead on a high performance

system of materials to reduce the rate of reflective cracking within a new asphalt surface.

Flexiplast was first introduced by Ringway's parent company Eurovia and has since appeared on a series of sites in Kent and the London Borough of Enfield. Use of the process in Guildford on behalf of Surrey

**"Flexiplast could become the recommended choice for constructing concrete overlays in Surrey."** Steve Isaacs

County Council in 2009 represents the largest application to date for a local authority in this country, says Manager of Ringway's specialist product developer Jean Lefebvre, Jonathan Core.

"We laid over 10,500m<sup>2</sup> of Flexiplast in Guildford and hope this will demonstrate further and without doubt, that concrete

foundation does not have to be 'crack and seated' to prevent reflective cracking," Core says. "Flexiplast is a crack inhibitor that also serves to seal the concrete base against water ingress and further damage."

Flexiplast is a two part system applied following the stripping of asphalt layers and the filling of visible joints and cracks in the concrete foundation layer with sealants.

Next comes the first important part of Flexiplast – spray application of a highly modified bitumen binder, which contains an elastomeric polymer, to provide a flexible membrane over the concrete. Ringway's Gripfibre microsurfacing is then applied.

This BBA HAPAS approved material, based on a bitumen emulsion and fine aggregate, provides a protective surfacing for the membrane and acts as the bond coat for the pavement's asphalt overlay surface course.

The combination of polymer modified membrane with Gripfibre forms a 15mm thick layer that accommodates for some of the thermal movements within the concrete, thus reducing the rate of deterioration in the new surfacing.

Altogether a strong and flexible foundation is formed, prior to overlay with a 40mm depth of asphalt surfacing.

"Using Flexiplast as an alternative to crack and seat has several benefits," says Core. "The process is far quicker, thus reducing public inconvenience. The whole construction is cheaper due to reduced layer thicknesses; this also makes the work more sustainable, with reduced aggregate volumes. The only constraints with this

Ringway's Flexiplast system features application of a highly modified bitumen binder to provide a flexible membrane over concrete road base





Flexiplast has been used at two sites in Guildford this summer – demonstrating that there is a viable alternative to ‘crack and seat’ in some circumstances

type of system are the climate – the Flexiplast layers cannot be applied during winter – and excessive vertical movement of concrete slabs. These require stabilisation prior to applying the membrane.”

Guildford’s first Flexiplast contract took place in June along a busy residential thoroughfare known as Southway. Material was used to cover an area of 2500m<sup>2</sup>. The concrete pavement had previously been overlaid several times with asphalt and surface dressing, and cracks on the surface gave a clear indication of the location of joints in the foundation.

Removal of the bituminous layers and application of the modified bitumen binder was quickly followed with the laying of the microsurfacing one Sunday morning and the entire road was reopened to traffic that afternoon. A surface course was laid the following day.

The second contract took place on nearby Grange Road, a more heavily used route which featured badly cracked and crazed asphalt surfacing. Around 8000m<sup>2</sup> of Flexiplast was laid in three days, with the contracting team ensuring the completed reconstruction matched the original carriageway levels.

Surrey County Council’s Asset Operations Manager Steve Isaacs says he was impressed by Flexiplast’s speed of application on both contracts and is pleased to have discovered a new method of extending the life of damaged carriageway.

“We have a problem in Surrey because there are many concrete based roads. Many are relatively old and some are faring badly,” Isaacs says.

“Full depth reconstruction is very expensive, so we had to find an easier way of putting a stop to reflective cracking. We are moving away from crack and seat as the process is not always effective and when it does not work well it can be as costly as full depth construction.”

The county was first introduced to Flexiplast after inviting Ringway – its term maintenance contractor in the west of the region – to discuss innovative road maintenance procedures at one of a new series of monthly meetings referred to as the ‘Innovation Forum’.

“Flexiplast could become the recommended choice for constructing concrete overlays in Surrey,” Isaacs says, “if the renewed roads fare well over time.”

## FLEXIPLAST PROVING ITS WORTH

**R**ingway’s Flexiplast system has stood the test of time in Kent, where it was first used in the UK nine years ago.

The crack inhibitor system was laid along a 930m long stretch of The Parade in Greatstone-on-Sea and was overlaid with a Stone Mastic Asphalt type thin surfacing.

A separate 400m length of road nearby was overlaid with the same thin surfacing to a standard approach without the Flexiplast system. Both sections of road exhibited similar defects prior to treatment.

Comprehensive surveys of the two refurbished sites were conducted four years later in 2004 and results plotted on a ‘cracking index’.

The road containing Flexiplast was found to have a cracking index of 0.002, against 0.337 for the standard section – a significant reduction.

“The Flexiplast site in Greatstone-on-Sea is still performing well to this day,” says Jean Lefebvre Manager Jonathan Core. “The conventional overlay showed signs of deterioration within 12 months.”