

## Client Side

# Thin surfacings in Northern Ireland: still favoured if designed correctly

Investigation of thin surface course systems in Northern Ireland has found the majority performing well, although occasional problems reveal a need to be vigilant in design and construction.

Northern Ireland's Roads Service is seeking to reassure highway engineers that thin surface course systems (TSCS) are appropriate for surfacing principal roads. The TSCS has to be designed correctly for the site, however, with attention paid to applied stress and quality of substructure and workmanship in laying, particularly around ironwork.

This is according to Roads Service Consultancy (RSC) senior engineer and author of a report on TSCS performance Geoff Lester. Following publication of the report and further developments, RSC is keen to ensure engineers in Northern Ireland develop well informed approaches.

"High profile failures of one or two TSCS type surfacings had given the rest a bad name. As a result a lot of engineers in Northern Ireland had lost confidence in TSCS and gone back to using hot rolled asphalt (HRA)," says Lester. "The key message is specify TSCS but get the design right because not all TSCS surfacings are suitable for all locations."

Contractors and asphalt manufacturers in Northern Ireland moved to develop their own proprietary TSCS materials from the late 1990s. By 2004 enough suppliers had gained HAPAS (Highway Authorities Product Approval Scheme) approval of their products to prompt Roads Service to issue 'Director of Engineering Memorandum' advice DEM 67/04 for designers of thin surfacings.

Increasing use and occasional problems have since raised concerns over durability, however, leading to RSC's commission. The work studied performance of proprietary TSCS materials laid since 2004 at 120 sites. The results find the majority of TSCS materials performing well. Major failures had occurred at



Thin surface course systems at 120 sites have been investigated. The majority are performing well

two sites, while failures around ironwork were found in 26 cases. Seven locations showed evidence of isolated texture loss, fretting or 'fattening up', while a single site exhibited rutting and potholing as a result of poor underlying layers.

"There are several reasons found for these problems, including use of 14mm materials at high stress sites where a 10mm material may be more appropriate," Lester says.

Manufacturers produced TSCS materials with 14mm aggregate primarily for generating the 1.5mm minimum texture depth specified by the Specification for Highway Works (SHW). "Too much importance was attached to texture depth. It's not even the key requirement of skid resistance," says Lester.

The minimum texture required by the SHW has since been amended to 1.3mm for thin surfacings and use of 10mm materials has become more prevalent. Designers still need to be very careful when designing for high stress levels.

"Some 10mm products with HAPAS approval have been tested at lower thresholds of traffic volume," Lester says. "Overall, proper design is essential, as is consideration of the substrate and contractors should be ensuring good compaction is achieved around ironwork."

More work is to be done including reissue of DEM 67/04 for Roads Service engineers. "Manufacturers also need to look at their TSCS mixes to make them more durable and compact better," Lester says.

Changes beyond tight tolerances set by HAPAS certificates would mean having to apply again through the exhaustive HAPAS approval process, but TSCS is now in the European Standard for asphalt BS EN 13108. "There is no reason why contractors cannot use factory production control and type testing for CE marking quality assurance instead," Lester says.