Abstract

Skid Resistance Performance Of Road Surfaces Utilising BOS Slag Aggregate

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An important function of a road surface course is providing skid resistance. Periodically, after polishing by traffic, this layer needs replacing to restore skid resistance to an appropriate level. UK, materials specifications require premium aggregates with a good resistance to polishing. These are becoming increasingly expensive and sources are few. Sustainable development demands consideration of alternatives such as industrial by-products.

The by-product of the Basic Oxygen Steel (BOS) process is the main type of steel slag produced in the UK (approximately 1.2 million tonnes annually), with about 10% utilisation in roads and agriculture at present. BOS slag has been used in surface courses for many years, but mainly within steelworks complexes or on local roads nearby. Consequently, most performance information is anecdotal, with no independent, systematic study of the skid resistance of the material.

TRL has been carrying out a study of BOS slag used in surface courses in the UK, on behalf of the Tarmac Group. The main objective was increased use of slag, simultaneously reducing demand for landfill and crushed rock. The purpose of the research was to establish evidence for the performance of the material in road surfacings, with a particular emphasis on skid resistance.

In-service skid resistance has been monitored at eight sites on UK main roads, including a purpose-laid comparative trial. This is assessing performance over time compared with the skid resistance requirements for those locations. The project has included supporting laboratory studies of BOS slag from the different UK sources, including microscopy, petrographic analysis and laboratory aggregate polishing tests.

The three-year programme of practical work was due to be completed in September 2002 and this paper will present some of the findings.

Biographical Details

Peter Roe

is a Principal Scientist and Research Fellow at TRL, where he has worked for almost 30 years. He began his career working with the skidding resistance measurement team, before working on sustainability aspects of road materials and studies of Frost Heave. He returned to the skidding field to assist in the development of TRL's texture meters and was responsible for work relating texture depth and accidents. He has led TRL's work in the aggregates and skidding resistance field for several years, including TRL's contribution to the PIARC International Experiment to harmonise Skidding Resistance and Texture measurements and he was responsible for oversight of the technical quality of TRL's work for a major EC project studying vehicle/tyre/road interaction.

He was a Principal Consultant for a project assessing skid resistance requirements for Hong Kong and has recently returned from a visit to the Lebanon to provide advice there. Currently, Peter is leading TRLs contribution to a joint project with the Forum of European Highway Research Laboratories (FEHRL) that is studying a procedure to harmonise skid resistance measurement techniques in Europe in support of CEN standards. Peter has continued his work in the aggregates field, looking further into the influence of polishing resistance on in-service skid resistance and he has renewed his involvement in sustainability issues with the study of the use of Steel Slag in road wearing courses that he will be speaking about today.

Peter is also a Consultant to the TRL Risk Assessment Team, providing specialist reports on road surfacing and skid resistance matters and acting as an Expert Witness. He has served on various British Standards committees and is widely respected as one of Europe's leading experts in the skidding resistance field.