

Key stone in short supply

New roads technology is generating a huge demand for high specification aggregates whose consented supply is strictly limited. Gordon Lemon sounds a warning.

Use of high specification aggregates – ie gritstones of high polished stone value, vital for skidding resistance – is growing exponentially as roads technology improves and knowledge of the benefits of hightech surfacings spreads. Never mind highway experts, even the technically challenged are clamouring for the quieter, safer roads now on offer. The general public loves the new surfacings and as a consequence, so do the politicians.

But can the surfacing industry rejoice? The answer is not yet. The high specification aggregates (HSA) on which much of the roads technology developed during the 1990s depends are in frighteningly short supply.

Make no mistake: there are measures the industry and its clients must take now to ensure that supplies are maintained and that ultimately, today's new and innovative surfacings remain available to highway specifiers.

Study review

The first thing to be done is to conduct a thorough review of the Symonds Travers Morgan study into the UK's HSA reserves, commissioned by the Government in 1993. The authorities had wanted to know how much aggregate of high polished stone value was available, bearing in mind Britain's mandatory standards for motorway and trunk road skidding resistance.

The study found that Wales and Northern Ireland were quite nicely positioned, with 62 and 35 years of reserves; but that consented reserves in England and Scotland amounted to only 21 years "at 1991 rates of consumption".

And there is the rub. In 1991, we used comparatively little high PSV aggregate, with surface dressing and rolled asphalt taking about 10kg/m² and 14kg/m² of the stone respectively. Thin surfacing materials have arrived since that time, with quite dramatic effect.

I believe that about 30% of surface dressing and about 60% of rolled asphalt are currently being replaced by thin surfacing, which uses much more HSA. A 15mm deep thin surfacing used in place of surface dressing takes about 36kg/m² of premium aggregate, while a nominal 30mm used in place of rolled asphalt takes around 71kg/m². These figures represent increases of 360% and 500% respectively.

My sums may not be irrefutable but there can be no argument that consumption of HSA has increased immensely. Thin surfacing technology, the technology of surfacing generally, is being driven by Government's desire to see traffic noise levels fall, which is compounding the problem.

Last year's Integrated Transport Policy white paper contains reference to noise on something like 30 of its 160 pages. This year, the Highways Agency has published advice note HD 36/99 which acknowledges that traditional forms of road surfacings are no longer suitable for many locations, especially in England where noise levels are high due to heavy traffic.

HD 36/99 encourages the use of thin surfacings and also other surfacings that reduce noise, namely porous asphalt and in the "white top" sector, whisper concrete.

Porous asphalt is generally laid 50mm thick and is made up almost entirely of HSA. Whisper concrete's noise reducing exposed aggregate finish also requires substantial amounts of premium aggregates. Either the complete concrete slab is composed of some 60% HSA or – when a concrete surfacing layer is applied monolithically – at least 50mm of the layer thickness has the same requirement.

Thin surfacing systems, porous asphalt and whisper concrete have all been developed through the 1990s. It is clear that the STM's 1993 study is now well out of date and that the matter of consented reserves needs to be addressed again as a matter of urgency. I have no doubt that the reserves left amount to only a handful of years at present rates of extraction.

Gordon Lemon says: "Among other things we can do is encourage specifiers not to over-specify, but to judge where premium aggregates are not strictly necessary."



A review of the original study will confirm the truth of this and also point the way to what needs to be done immediately to start the time consuming process of raising consents for further extraction of HSA. It is up to the industry to get the message across to the general public that high PSV aggregate contributes greatly to road safety and traffic noise reduction but is in short supply; and ergo, not all quarrying is a bad thing.

Over-specification

Among other things we can do is to encourage specifiers not to over specify, but to judge where premium aggregates are not strictly necessary and where alternatives might be used; and as an industry, to actively promote research into skidding and its prevention.

Highway safety is a paramount issue in Britain and rightly so: we have the least number of accidents on our roads per capita of any country in western Europe and it would not do to use non-HSA where HSA is required. That said, there is now room for manoeuvre following research into skidding at the Transport Research Laboratory.

Britain's standards for skidding resistance mentioned above came into force in 1988 and a table of PSV levels needed to achieve the various levels of skid resistance was published in the Highways Agency's Specification for Highways Works. This shows that most heavily trafficked roads require aggregates with a PSV of over 57.

TRL research carried out after introduction of the skidding standards indicated that high PSVs were not necessary along "non



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event sections" of road, ie where accidents do not generally occur. Subsequently, the Highways Agency included within HD 36/99 new PSV tables which – while not directly comparable with the original table – generally allow lower values of PSV to be used on non event road sections. Another discreet message from the Highways Agency to specifiers is that they "should examine all options".

So, a greater range of aggregates can now be used for road surfacing. It should be noted, however, that the new table increases PSV values for difficult sites.

Further research is required, in my opinion, into surface skidding, to see whether the macro and micro textures being specified are truly appropriate, or whether they can be modified to improve skidding resistance, and perhaps reduce the HSA currently required.

All in all, the industry should be increasing the overall efficiency of surfacings by optimising the use of appropriate materials and ensuring that over-specification does not occur. One last thing; innovation must be allowed to continue.

High spec aggregates – like those from Giffach quarry in Wales – are an increasingly valuable resource.

