

BITUMEN QUALITY – RPF NOVEMBER 2003

Background

This presentation deals with the recent reports on premature distress of hot mix asphalt laid during late 2000 and 2001. It is estimated that it occurred in approx 1.25% of asphalt laid in Gauteng since then and less than 4% of asphalt laid during the period under consideration.

As is usual, attention first focussed on the quality of the bitumen.

If that were so or not, it brought to the fore that perhaps now was the time to bring focus to bear on the management of quality of the product beyond the refinery loading bay.

Sabita was requested by its members to look into the matter with a view to finding a resolution of the issues at hand, but particularly to redress the negative perceptions that were doing the rounds, some of them based on shaky grounds.

I should stress that it is not – and never will be – the role of Sabita to meddle in or resolve contractual issues. Our role is simply, in the light of these experiences, to examine means (procedures and processes) that would ensure that bitumen, manufactured in accordance with current specifications, has a high degree of probability of arriving at the place of work still complying with the requirements.

You will ask – what about the handling of the product at the depots and plants? Most of those procedures are well documented and it really is a matter of compliance with best practice. What is perhaps less well documented and managed is what happens during prolonged transport.

Nature of the distress

Typically on the roads visited (P5/1 and P41/2):

- Block cracks like shrinkage cracks in cementitious materials at initially 4m intervals
- In some cases star cracks
- Material at the cracks was brittle and lifeless
- Secondary (traffic associated) cracks

While there were some initial indications that the material involved was from a single source (including bitumen), it could not be confirmed. To date this feature has only been reported in Gauteng.

Process

1. The establishment of a Sabita ad-hoc working group on bitumen quality (represented by primary producers, refinery staff and one representative each of the hot mix and chip seal sectors).
2. Contact was made with both Gautrans and SANRA to establish a structured communications process.

3. A contact forum between the industry and Gautrans is in the offing. SANRA would be approached to participate, should they feel that they can benefit.

Outputs to date

1. *Testing programme* for all bitumen from SA refineries (including retained samples representative of problem areas) by an independent test-house (Nottingham University) for:
 - a. Compliance with SABS 307
 - b. In addition High Temperature Simulated Distillation (also called ASTM D 2887 EXTENDED when using the HP/AC Alliance software and should go up to 750°C plus chromatogram. (The reason for this is that there were reports issued locally that fractional analysis indicated that the composition of the bitumen extracted (by what means?) was uncharacteristically undesirable.)
 - c. Assessment of fitness for purpose in the light of these results or possibly on the basis of additional tests.

Samples have been dispatched and results are being awaited.

2. *A representative working group* to investigate the likely impact of the bulk transportation process on bitumen quality. The aim is to arrive at a procedure that will ensure minimal negative impact on quality of the products being transported.

Such process should be:

- Clearly defined and documented
- Easy to implement and maintain
- Economical
- Measurable
- Auditable
- Sustainable
- Acceptable to all (reasonable) parties involved in the supply, hauling and receiving of bulk bitumen products.

The output of deliberations should deal specifically with all aspects involved in the following:

- Loading (procedure at source)
- Heating (method, monitoring equipment & procedure, throughout)
- Contamination and switch loading (including sealed parcels, back haul loads)
- Cleaning (flushing materials and process)
- Sampling (sampling point location, techniques, storage, retention times)
- Off loading (procedure at destination).
- Vehicle configuration (to optimise retention of quality)

A method statement covering the above is currently under review by the group.

2. *Investigation into probable cause of distress.* Apart from current investigations launched by individual members, Sabita has discussed the investigation into the probable cause of the distress by a competent materials engineer. A clearer set of terms of reference would become evident once the test results and assessment of fitness-for-purpose has been carried out.

It must be stated quite clearly that there is a collective desire on the part of Sabita members to establish the cause of these problem areas. *It is not Sabita's aim to resolve the contractual issues* – it is simply a process of pre-empting similar occurrences in future in terms of its core goals to promote excellence.