Bitumen changes (continued)

recommended that any movement towards alternatives should be towards sealing multigrades (if available) or appropriate classes of PMB.

Conclusions

1. C170 binders appear to have become more temperature susceptible with time.
2. Using C320 in lieu of C170 may produce whole of life cost implications due to the reduced durability of C320 compared to C170.
3. Where practitioners have concern over the use of C170 for a particular application, sealing grade multigrades or an appropriate class of PMB should be considered.

News from the Board

Changes in Board Composition

To ensure increased District involvement, Jenny MacMillan of Metro and Laurie Murfin of Central Queensland have joined with Dennis Wogan and Allan Stone taking a rest after years of support.

AAPA's Ron Coutts takes over as Board member from Doug O'Brien .

Alliance Business Plan 2006/2007

Tighter integration required with Strategic Plan and Main Roads projects

Linkage to District involvement to be included in 2006/2007 plans

Reports

Troutbeck & Kennedy 66 issues mostly addressed—balance to be updated at Reference Group meeting in late May 2006.

Staff changes in Main Roads include:
DDG Les Ford,
Colin Jensen to DDG Transport.
Bob Drew & Gil Heaton to leave QDMR. Miles Vass DD Nerang.

Alliance Projects

SMA Gateway trail report expected in late August 2006. Further trials planned in early 2006/2007

Skid resistance survey data being released to asphalt suppliers (for their own mixes) should increase the level of understanding & awareness.

Staff interchange program has commenced with Herston staff member to go to industry from July/August 2006.

Next Board Meeting

Monday 11 September

Edited by: Rob Vos, Gavin Soward, Ian Reeves, Russ Spies
Layout/Design by: Vickie O'Brien

Available electronically on: http://www.aapa.asn.au
or Main Roads Intranet

Queensland Government
Department of Main Roads

Strategic Alliance
NEWS LETTER
Developing superior flexible pavements

AAPA AUSTRALIAN ASPHALT PAVEMENT ASSOCIATION

Issue 1 of 2006

Alliance Reference Group meets again

Some delegates to the Alliance Reference Group during the workshop session

At the end of May 2006 over 60 delegates responsible for flexible pavements and road surfacings met in Brisbane under the auspices of the Strategic Alliance.

Having not met since before the Federal SMA issue there were many topics to catch up on including:

1. Main Roads update 2.Federal Findings
3. Recent Litigation 4. Skid Resistance
5. SMA trials 6. Staff Interchange
7. Roadwork safety 8. Spray seal binders
9. Asphalt spec issues

Details of item 8. by Russ Spies are reported later in this news letter.

A workshop followed presentations on the topics, addressing numerous questions submitted by the delegates before the meeting. Two questions were selected for detailed debate to give direction to the Alliance Board for future action.

The proceedings of the Reference Group have been captured on a CD which is available on request from Vickie O'Brien *Vickie.d.o'brien@mainroads.qld.gov.au*

Workshop gives feedback to questions

What should Main Roads tweak to ensure better performance and more consistently?

Include supplier performance in tender
Link lab design to field performance
Current Rego system good basis
Encourage bonus payments
Consider longer warranty
Guidelines on selection of asphalt types
Get database - mix & field performance

Implementation of a HAPAS type performance system for road surfacings ?

Performance specifications needed
Agree on performance parameters
Consider what risks to share
Find ways to protect confidentiality
Performance data needed
Not for all Districts
Running of pilot project supported

Bitumen - keeping up with the changes

by Russ Spies Principal Adviser Materials Testing

Background

In recent times, and particularly over the last 3-4 years, there has been a rising wave of anecdotal complaints from departmental practitioners about sealing bitumen behaviour which seem related to its softness and/or tenderness. Such complaints are typified along the following lines:

(i) increased runoff from the surfacing, as manifested by rivulets of binder progressively increasing outside the sprayed pathway during periods of high temperature
(ii) an increasing tendency for aggregate rollover and overturning during rolling and early trafficking of fresh seals in hot weather
(iii) gross aggregate rollover at turnouts and turning intersections
(iv) early flushing or bleeding of seals laid in recent times.

While other external factors relating to sealing practice may also be involved, it is widely perceived that recent bitumen supplies have become increasingly soft and/or tender.

Sealing Binder Test Results

The supplied Class 170 binder, provided under a Queensland Government standing offer arrangement (SOA), is regularly tested by QDMR under a corporately funded audit program. Such departmental results have been assembled back to the start of 1998 and are here summarised in 6-monthly blocks in terms of their mean and standard deviation.

Viscosity at 60 degrees (V60) should be a direct indicator of bitumen softness towards the upper range in pavement service temperatures. Pre-June 2000 results average at 177 Pa.s whereas post-June 2000 average at 169 Pa.s. In the last 3-4 years, V60 has averaged at 171 Pa.s. So Figure 1 indicates there has been only marginal softening over recent times. The V60 properties are remarkably uniform and almost perfectly coincident with the target. In fact in the last twelve months there looks as though there has been a general intentional hardening of the binder, perhaps in response to the general comments that the supplier has been getting in relation to softness.

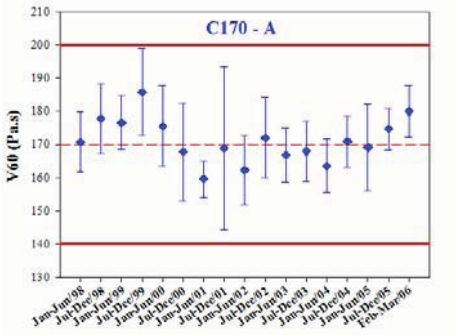

Figure 1- Viscosity at 60 degrees (60) versus Time

The Rolling Thin Film Oven (RTFO) test results are shown in Figure 2. The results of this test can be used as a first pass test as to whether a binder could be becoming more tender. Tenderness as used here relates to the compositional balance of the binder which influences the internal structure of the components which then

determine the setting-up characteristics of bitumen during the early days of service directly after laying. Based on the results it is fair to say that this property is reducing and therefore that binders are becoming more tender with time.

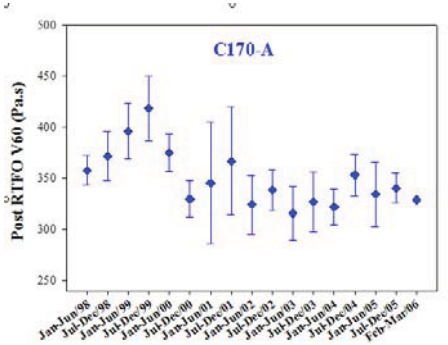

Figure 2 - RTFOT at 60 degrees versus Time

The V60 and RTFO results (as detailed above) are related to properties of the binder at 60 degrees. At the cooler end, at 25 degrees, we measure hardness. Hardness is measured in terms of a needle penetration (P25) test. Figure 3 indicates that in more recent times there has been a definite movement towards the harder specification limit which is set at 62.

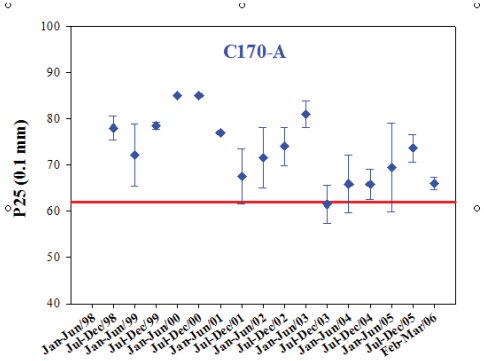

Figure 3 - P25 versus Time

Given that binder viscosity is rather uniform at higher temperatures but definitely harder at lower temperatures (P25), it is fair to say that the binders we are now dealing with are more temperature susceptible.

Alternative Sealing Binders

In response to softness problems, some Departmental sectors have moved to sealing with C320 from the same supplier. The considerable downside to this movement is on the score of durability. While the durability of both grades from this supplier has increased harmonically in recent times, the durability of C320 is quite consistently just 2/3 of the durability of C170 for about equivalent cost. (refer Figure 4)

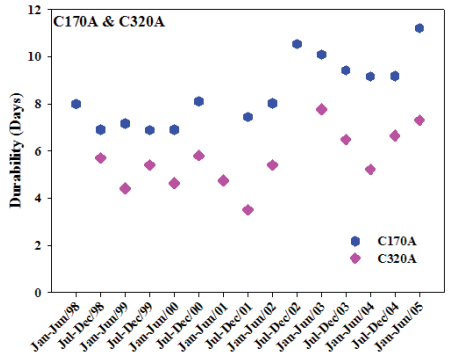

Figure 4 - Durability of C170 and C320 versus Time

While I can support use of C320 for waterproofing seals shortly to be buried under asphalt layers with no durability consequences, I caution against wholesale movement to C320 for most general sealing work on the basis of whole-of-life cost consequences. Where disgruntlement with C170 behaviour has reached the level of intolerance, it is