Creating wealth through infrastructure

26th ROADS PAVEMENT FORUM November 2013

Maximising Sealwork

Steph Bredenhann

6 November 2013

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD

Reg. No.1998/009584/06

Research Plan

- Phase 1
  - Current best practice (Winter seals)
- Phase 2
  - Draft Strategy to maximise sealwork
  - Winter seal trial sections
- Phase 3
  - Material specifications & Winter seal guidelines
  - Monitor winter seal trials
- Phase 4
  - Distribute and collate feedback from industry

Phase 3 - Status

- Appropriateness of COLTO
- Testing protocols
- Study tours
- Workshops (internal and SAT)
- Interim report

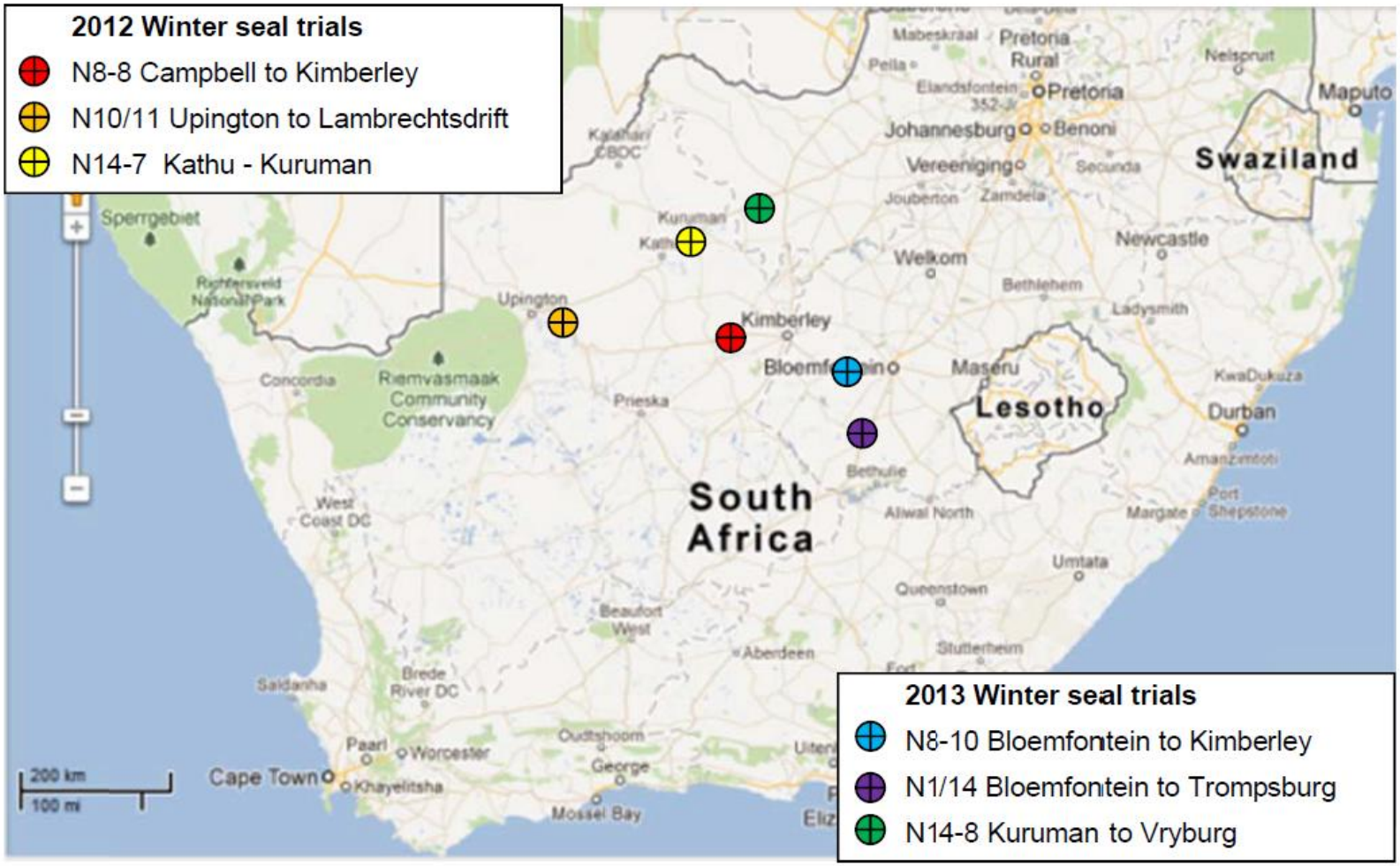
Internal SANRAL workshop
21st Nov 2013 in Pretoria

Phase 3 Report

- Summarise trials
- Lessons learnt
- Recommendations
- Current specifications
  - Appropriate aggregate specifications
  - Shortcomings binder specifications
  - COLTO specifications
  - SANRAL pro-forma

Creating wealth through infrastructure

Trials



Typical trial combinations

Seal types	Binders	Solvents	Application	Cover spray
13 Single	BR Summer BR Winter NCRT	4% HFS	Low –High	None 0.8–1.0 l/m^2 50/50 – Undiluted 0–3% LFS
19/9 Double	S–E1(SBS) S–E1(SBR) SC–E1	0–4% LFS 0–3% LFS	Low –High	0.8–1.0 l/m^2 50/50 – Undiluted 0–3% LFS
19/6/6 Split	S–E1(SBS)	0–4% LFS	Low –High	0.8–1.0 l/m^2 50/50 – Undiluted 0–3% LFS

Climate

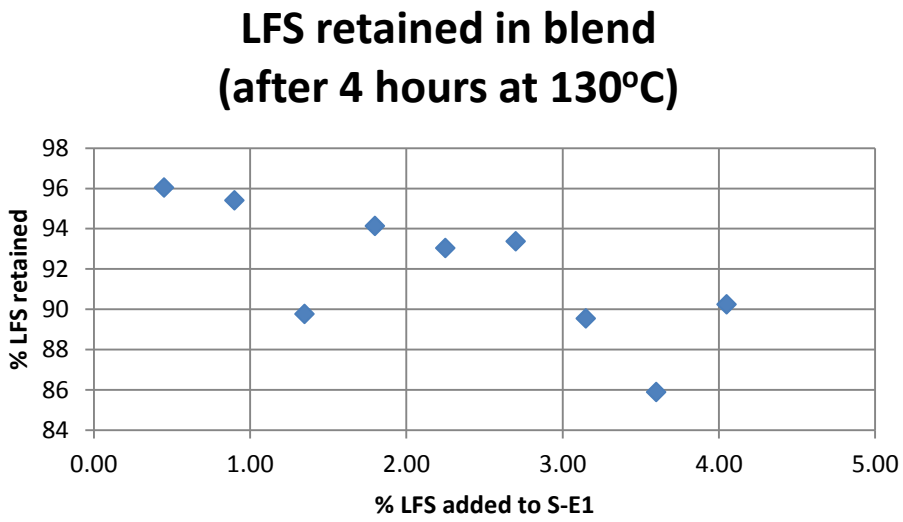
Climate data is collected continuously on site

Reliable equipment

Calibrate equipment

Loss in solvents during transport

- Concerns were raised that cutters are lost during transport
- Laboratory tests showed in figure (4 hrs)
- Question arises: rather cut back on site?



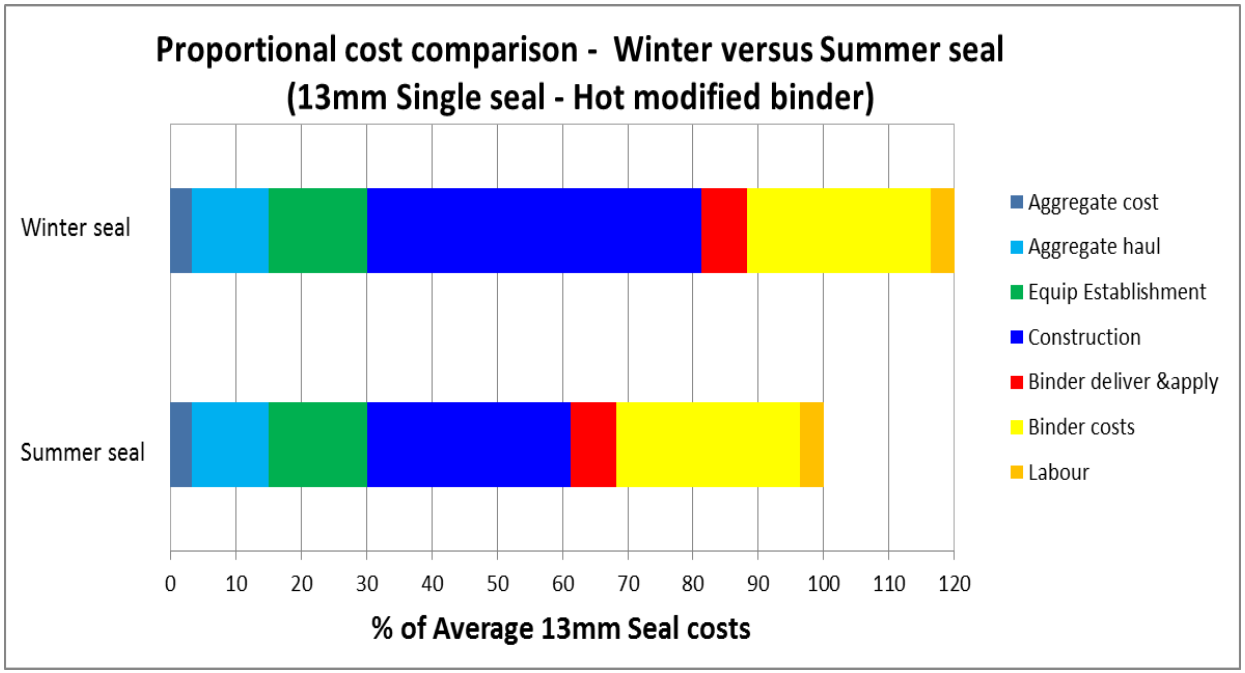
Blending on site

- Establish a plant on site
- Used MC30 as cutter
- Specs for MC30 in place
- Expensive operation

Safety: Procedures were developed to blend on site – currently being improved by SABITA

Cost Implications

- Approximately 20% to 30% more compared to summer sealing
  - Waiting for road surface temperatures
  - Waiting for emulsion to break
  - Waiting for proper adhesion to develop
  - Waiting for fog spray to reduce tackiness



But higher utilisation of equipment will offset cost

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD

Reg. No.1998/009584/06

Precoating with emulsion

- Wet stockpile about 1 ½ hour before mixing otherwise emulsion is absorbed by dust without coating the stone
- Mixing 12 l/m^3 (diluted 50%) of stone using frontend loader
- Emulsion takes a long time to break in the stockpile therefore stockpile needs be turned once a day for a week
- Both SS60 and CAT65 used, CAT65 " tacky" and formed lumps, but didn't clog chip spreader
- Precoating with SS60 proved to "cheaper" than using Colcote
- Sections done with SS60 could be opened earlier to traffic
- Far less pick-up

New developments

- Pull-out test
- Better adhesive test to replace Riedel & Weber
- Simple test to determine binder properties at low temps
- OHS guidelines for blending on site (SABITA)
- High viscosity emulsion for steep gradients (New Zealand)

Research

- Full frequency sweeps at CSIR
- Properties of recovered binder and ascertain how cutter really evaporated
- Bitumen Bond Strength (BBS) tests at Stellenbosch University
  - Aggregate types
  - Binder types
  - Precoating fluids
  - Curing periods
  - Temperature variation (can 25 °C base temp be reduced?)
- Sweep test

Creating wealth through infrastructure

Way forward

- Finalise Phase Report (work document)
- SANRAL workshop 21st November 2013
- SAT workshops
- Distribute final report

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD

Reg. No.1998/009584/06

Creating wealth through infrastructure

Next generation of engineers!

Thank you for your attention

THE SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LTD

Reg. No.1998/009584/06