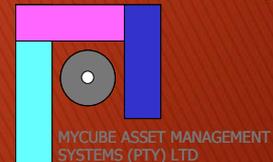


MAXIMISE SEALWORK THROUGHOUT THE YEAR

Progress: May 2013



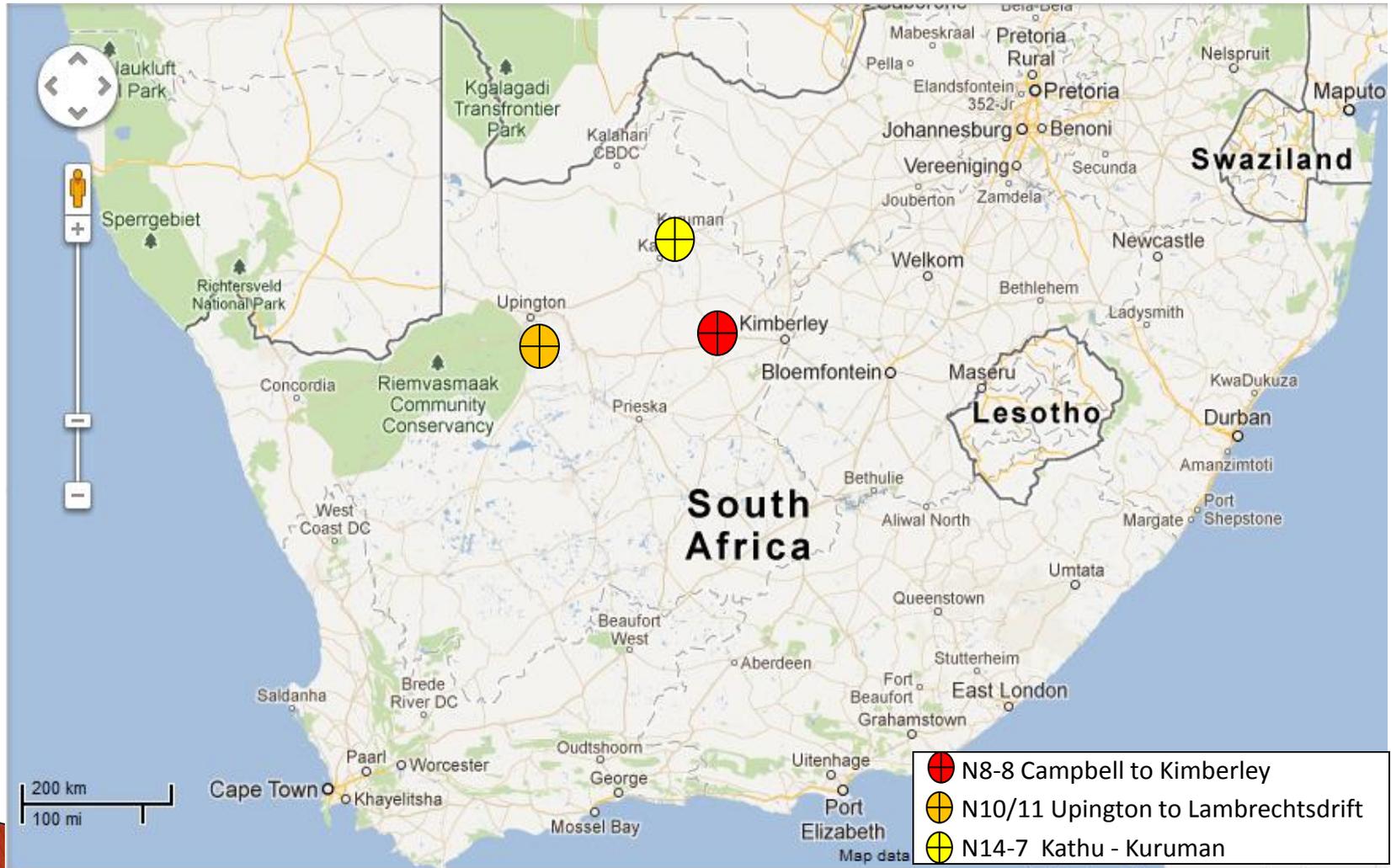
Study summary and progress

- ▶ 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

Progress: Phase 1 completed

- ▶ Feedback from local practitioners regarding seal practices applied during winter
 - ▶ Inspected 18 road sections where winter grade binders have been successfully used during the past decade
 - ▶ Industry opinions regarding:
 - Bitumen shortage and possible solutions
 - Aggregate demand and availability
 - Alternative seal types and specifications
 - ▶ Summary of international practices highlighting:
 - Winter embargo on seal work applied by most countries
 - General movement away from cutback bitumen towards emulsion
- Limited studies and winter seal trials elsewhere

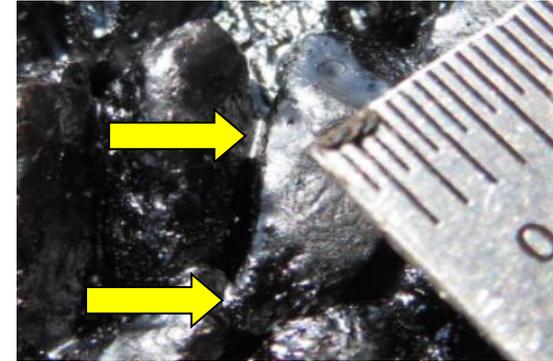
Location of Sites



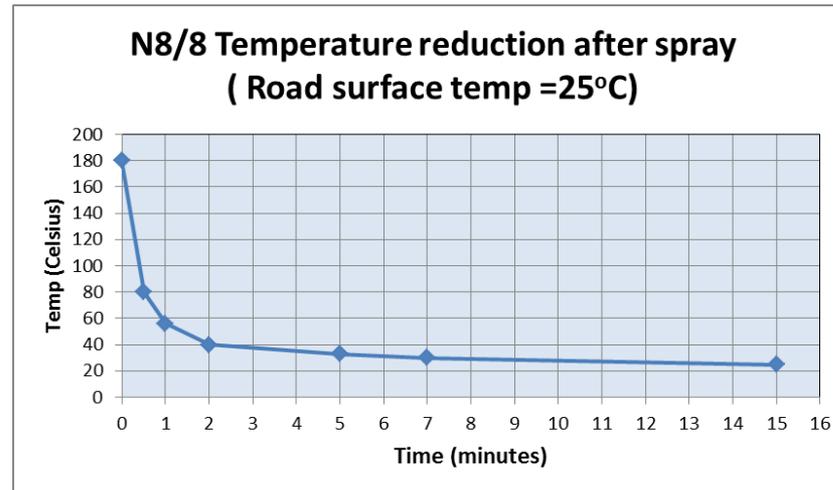
Seal types	Binders	Solvents	Application	Cover spray
13 Single	BR Summer	4% HFS	Low -High	None 0.8-1.0 l/m ² 50/50 - Undiluted 0-3% LFS
	BR Winter			
	NCRT			
19/9 Double	S-E1 (SBS)	0-4% LFS	Low -High	0.8-1.0 l/m ² 50/50 - Undiluted 0-3% LFS
	S-E1 (SBR)			
	SC-E1			
19/6/6 Split	S-E1 (SBS)	0-4% LFS	Low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

Key issues

- ▶ Cover spray



- ▶ Construction

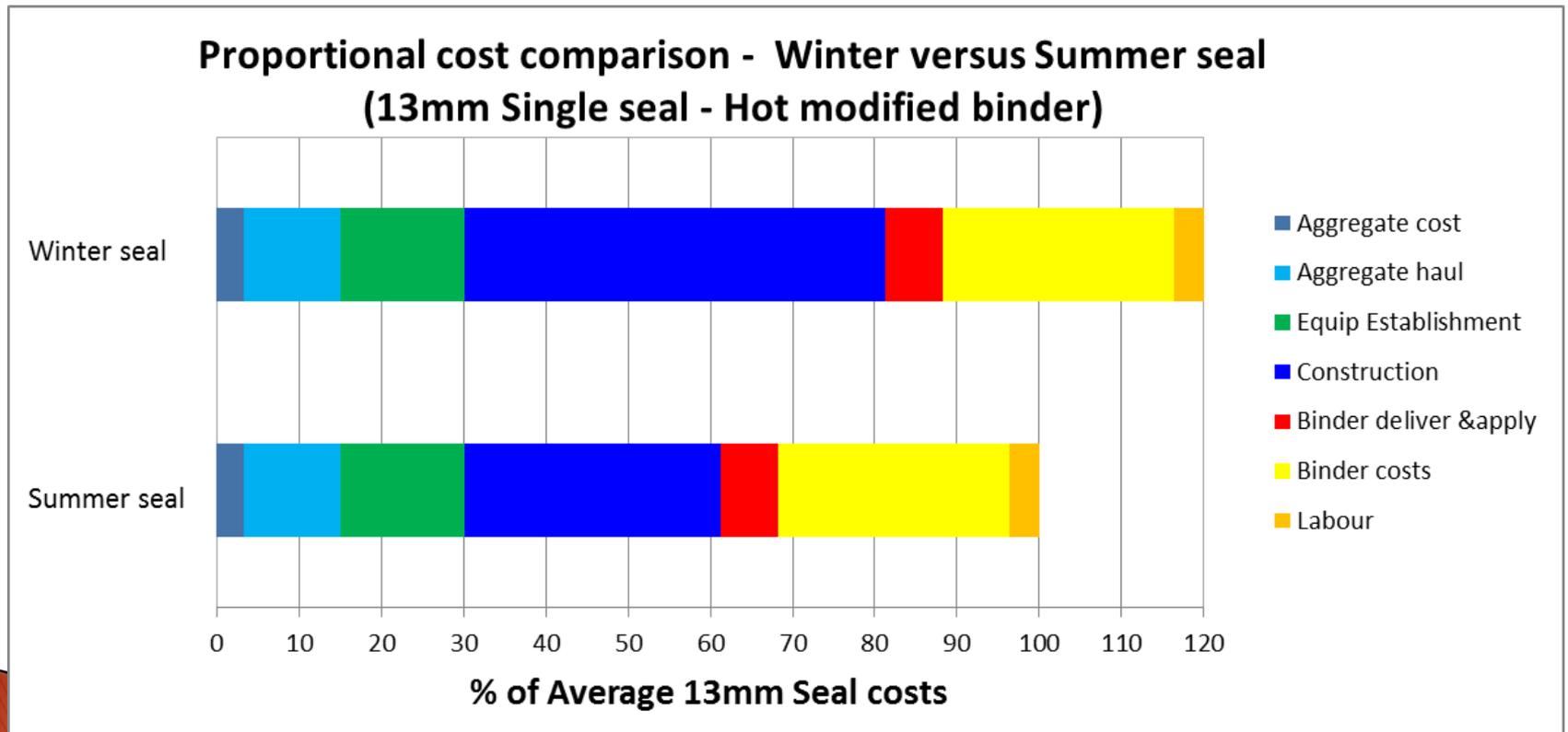


- ▶ Time to opening (NB)



Cost Implications

- ▶ Approx 20 % more when compared to summer sealing



N8-8 (19/6/6 Split double seal) – 1 year

N8/8 Sections	km	Binder	Tack		Penetration		Fogspray			Typical Texture	
			Application	% HFS	Application	% LFS	Ratio E/W	Application	% LFS	Initial =2.83	After 1st sum
5		S-E1	1.4	0.00%	1.55	4.00%	70/30	1	0	Min Texture	2.65

LFS only in penetration coat



N8/8 Sections	km	Binder	Tack		Penetration		Fogspray			Typical Texture	
			Application	% HFS	Application	% LFS	Ratio E/W	Application	% LFS	Initial =2.83	After 1st sum
8		S-E1	1.5	4.00%	1.65	4.00%	Undiluted	1	0	Min Texture	2.49

LFS in all binder applications



N10/11 (13mm Bitumen Rubber) - 1 year

N10/11 Sections	km	Binder	Tack	Fogspray			Typical Texture	
			Ratio	Application	% LFS	Initial = 3.25	After 1st sum	
2,3,4,		Summer S-R1	2.3	60/40	0.9 - 1.0	0%	Min Texture	2.2



9	96.4	Summer S-R1	2.5	70/30	1	3%	Min Texture	1.96
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20	104.4	Winter S-R1	2.5	No Fogspray			Min Texture	2.83
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Lessons learnt

▶ 19/9

- No bleeding where 0% LFS in Tack coat
- Do not increase application rate due to LFS
- SC-E1 in penetration layer not recommended

▶ 19/6/6

- No bleeding regardless of LFS up to 4% in all layers

▶ 13 BR

- No bleeding on Winter grade (4%HFS)
- Winter and Summer grades sensitive to Fogspray
- Especially if LFS in fogspray

Lessons learnt from other sites

- ▶ Cape seals
 - Effect of cutters in tack coat

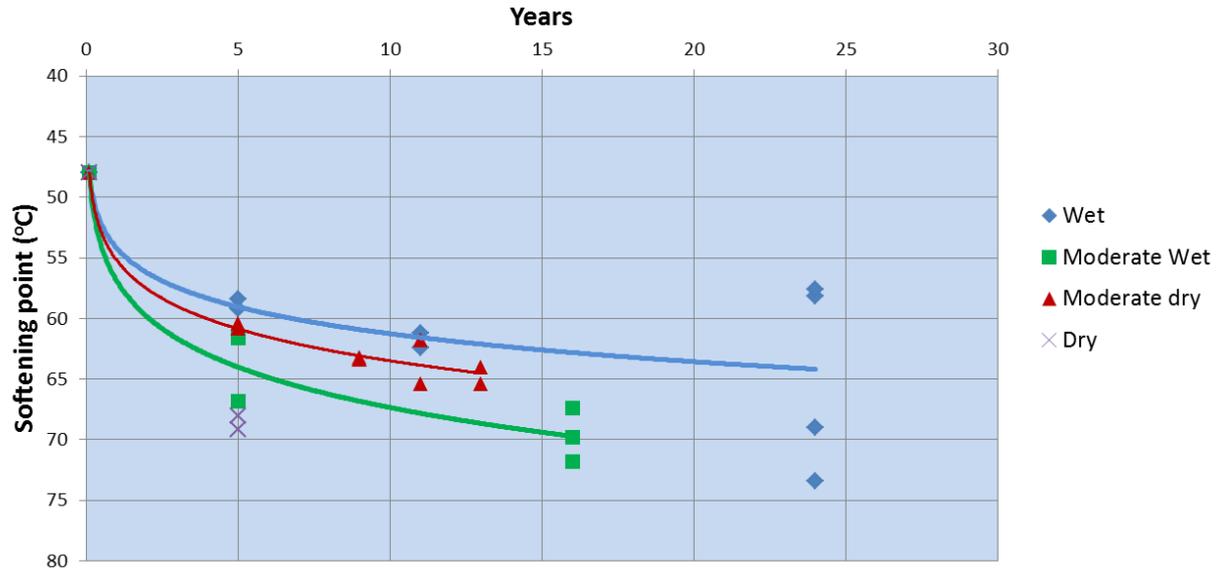


Cape Seals on soft BSMs

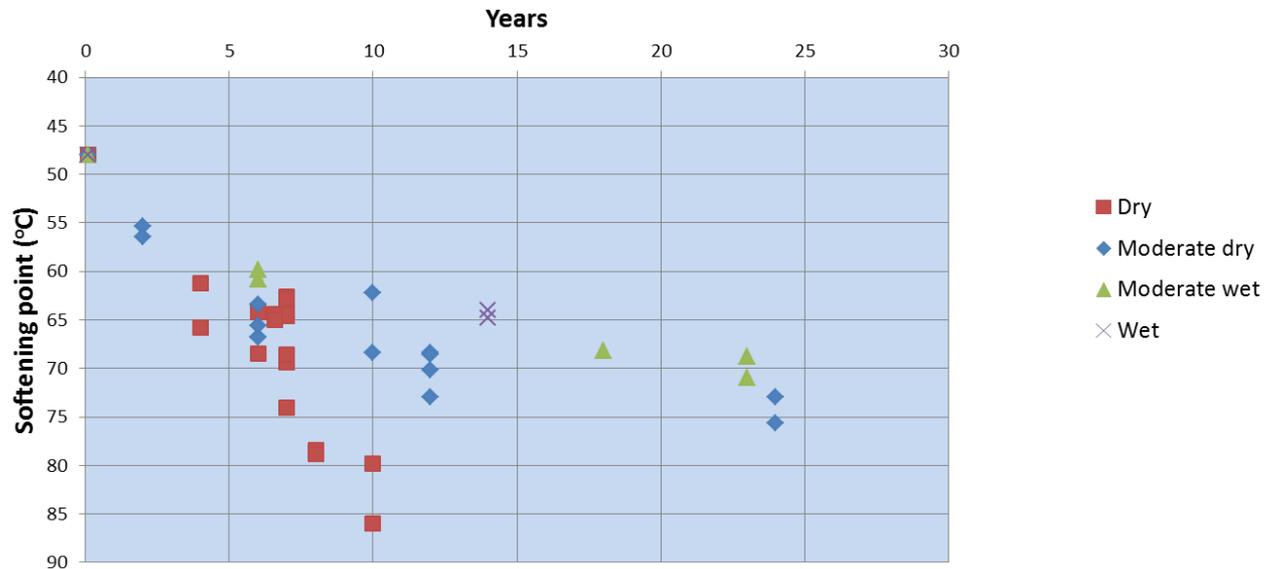
- ▶ 70/100 CS vs 40mm AC
- ▶ 70/100 CS vs 19/6/6
- ▶ 70/100 CS with dry slurry



Cape Seals Ageing



Double Seals Ageing



Other issues

- ▶ Base moisture after prime
- ▶ Effect of prime solvents
- ▶ Effect of precoat solvents



Way forward

- ▶ **Finalise Draft Strategy**
 - Material procurement
 - Environmental / safety aspects
 - Specifications
- ▶ **Finalise Winter seal guidelines**
 - Seal selection (Risk matrix)
 - Traffic/ climate/ binder
 - Revised aggregate specifications
 - Good practice & method specs
 - Specs on solvents & blending process
- ▶ **Additional winter seal trials**
 - Higher traffic
 - Seal types
 - Other climates

Winter Seal Trials

Winter Seal Trials								
Cold (sub-zero night temp)					Moderate (5 - 10 DegC Night temp)			
Dry (Summer rainfall)			Wet (Winter/all-year rainfall)		Dry (Summer rainfall)		Wet (Winter/all-year rainfall)	
High Traffic	Low/Med Traffic	High Traffic	Low/Med Traffic	High Traffic	Low/Med Traffic	High Traffic	Low/Med Traffic	
13/6 Double		N8/10 (2012)						
13/6 Double		N8/10 (2013)						
19/6/6 Split	N14/8 (2013)	N8/8 (2012)						MR188 (2012)
19/9 Double	N1/14 (2013)	N14/7 (2012)						
13 Single		Gauteng						
13 Single		N10/11 (2012)						
13 Single		N10/12 (2013)						
Cape Seals	N14/8 (2013)						N2/16 (2013)	

Good Experiences								
Cape Seals	70/100	Temp	S-E1	Temp	Cat 65	All- OK	SC-E1	All- OK
Sand seals	MC3000	All- OK	Cat 65	All- OK				
6.7 or 9.5	Cat 65		With cover spray	All- OK				
			Microsurfacing	All- OK				

2013 Trials

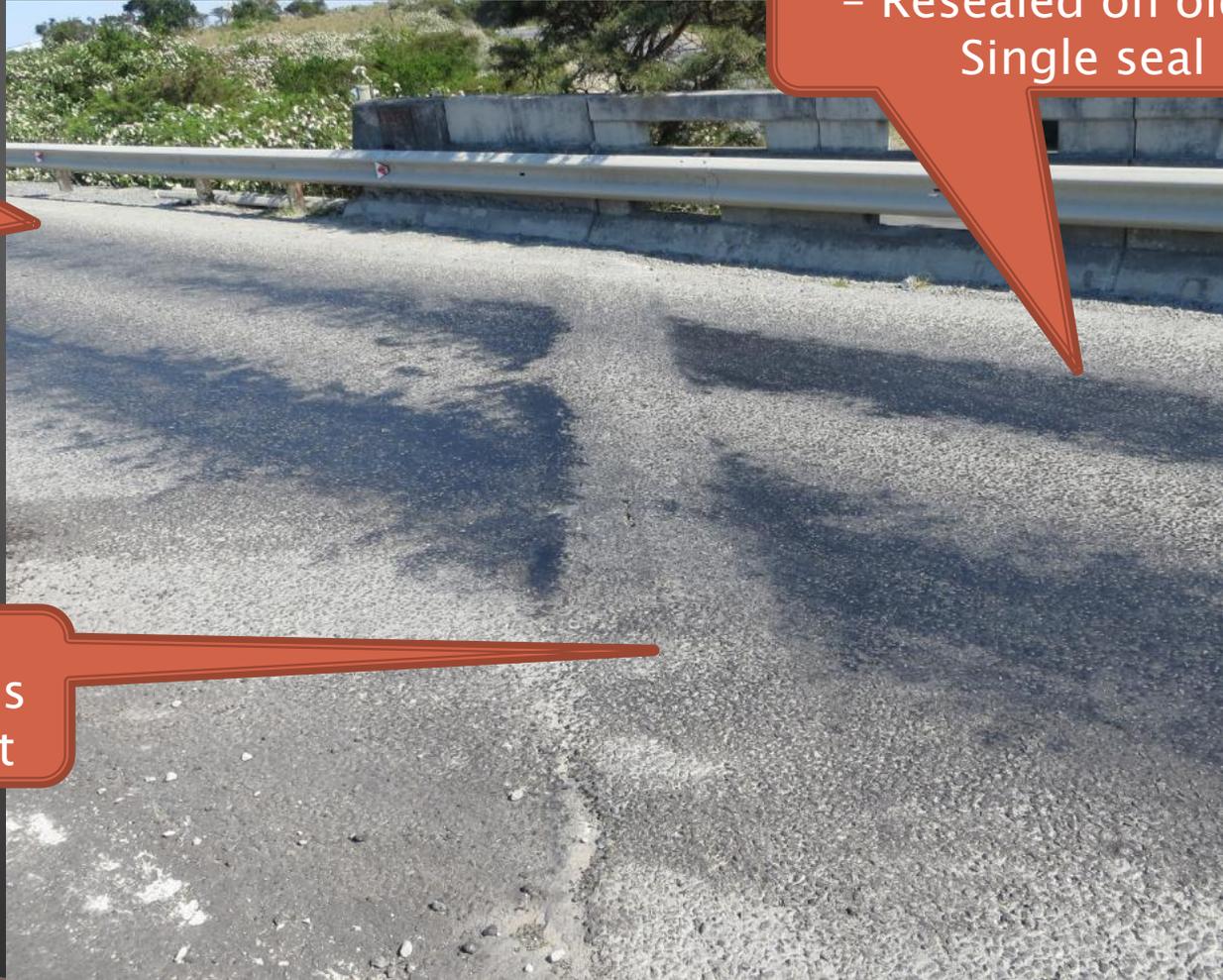
- ▶ 13/6, 19/9, 19/6/6, Cape Seals
- ▶ Stone packing on Cape Seals
- ▶ Binder distribution e.g. 40/60 with SC-E1
- ▶ Seal at 10(SC-E1), 15 and 20°C dependant on LFS
- ▶ Heavy traffic
- ▶ Wet climate
- ▶ Precoating with emulsion

SC-E1 (3% LFS) Cape Seal

Fattiness on
G1 Base

Bleeding on Bridge deck
- Resealed on old 13
Single seal

Zero
bleeding/fattiness
on Concrete joint



End

