



**2020 ISSA Preservation Performance Award
Nomination – Cape Seal Benalla Victoria**

2020 ISSA Preservation Performance Award



Nomination Details;

Nominating Member ; Downer EDI Works – 125 Somerton Road
Somerton Vic Australia
Paul Price – Manager
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Agency Nominated; North Eastern Maintenance Alliance (NEMA)
Regional Roads Victoria – 52 Clarke Street
Benalla Vic 3672
Neville Adair – Senior Works Officer
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Project Overview;

The Vic Roads FY13/14 periodic maintenance program identified a section of arterial road in Benalla in Nth East Victoria. The site was formerly part of the interstate highway network and now formed a major arterial road within the urban boundary of Benalla servicing a mix of light industrial and residential vehicular movements. Traffic volumes of the site are approx. 9000 vehicles per day with approx. 10% of these as heavy vehicles. The site, by its nature, caters for extensive amounts of turning and screwing actions of traffic in normal use. The total area of the site including parking lanes adjoining the trafficable area equated to 11,200m². Treatments considered need to meet performance criteria to facilitate desired attributes for waterproofing the surface, mitigate reflective cracking of the existing pavement, ability to cater for high volumes of turning and torque actions for traffic and a quiet riding surface. Budget constraints and economical cost models also needed to be met to enable the delivery of the most cost effective and long term outcome.

Treatment undertaken;

For this site, a preservation treatment design was chosen using a Polymer Modified Binder (PMB) spray seal, overlaid with a Microsurfacing SFT (suspended fibre technology) cape seal. This design was chosen ahead of more traditional mill and fill asphalt based on economical costs savings apparent between the treatments and performance achievable for the scope of the site.

The design of this surfacing option was;

1. S20E SAM PMB layer, applied residual binder rate of 1.7 L/m²
2. 14mm aggregate spread at approx. 10% less than traditional seal of this size.
3. The use of minimal cutter and volatiles with aggregates pre coated very lightly.
4. Application of Microsurfacing SFT 7mm material applied over the seal with a tight application to fill created surface voids and lock in the seal aggregate.

All applications (spray seal and microsurfacing) were applied by Downer within two working shifts in February 2014

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Treatment Selection – Project eligibility for award;

An investigation into the various treatment options available for this site was undertaken in collaboration with industry. This investigation revealed;

- This site exhibited extensive surface cracking but with the pavement is still in good to high condition for its shape and drainage. The site had displayed surface cracking defects for many years but recently the cracking had become more prevalent.
- To repair the cracking for an asphalt overlay would require extensive deep patches to prevent reflective cracking. Assuming the pavement is consistent, and the cracking has been progressively getting worse over time, any areas not repaired were assumed and likely to further crack in the future. The potential was therefore for further reflective cracking through an asphalt surfacing.
- Because of the vehicle turning movements accessing businesses and from side streets, the use of a fabric reinforced spray seal at this location was not recommended due to the potential for fabric to shove and move under such vehicle movements.
- It was recognised however that to effectively waterproof and mitigate the extensive cracking, the use of a Stress Alleviating Membrane (SAM) seal with a 14mm aggregate was the best choice of options. As a standalone treatment however this was further recognised as not effective in delivering performance for high volumes of turning traffic or for desired attributes for road noise.
- The use of a two coat spray seal application was considered, and may stabilise the surface and resist the turning traffic, however experience with this treatment had shown poor outcomes in urbanised areas due to surface bleeding or binder flushing in recent years, with many examples known within the region. A bleeding seal anywhere is undesirable and the risk of this happening in a town was unacceptable.
- Consideration was given to Cape Sealing, a combination of spray seal overlaid with microsurfacing. Cape sealing designs combine a spray seal to which microsurfacing is applied to fill surface voids. This type of treatment provides a highly flexible and waterproof membrane coupled with a hard wearing surface that would meet all desired performance attributes for the scope of the site in its ability to cater for turning traffic, cost effectiveness and asphalt like aesthetics. This design was adopted however modified for the scope of the local conditions.

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Site Location – Bridge Street Benalla Victoria



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Pre-existing condition – January 2014



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Pre-existing condition – January 2014



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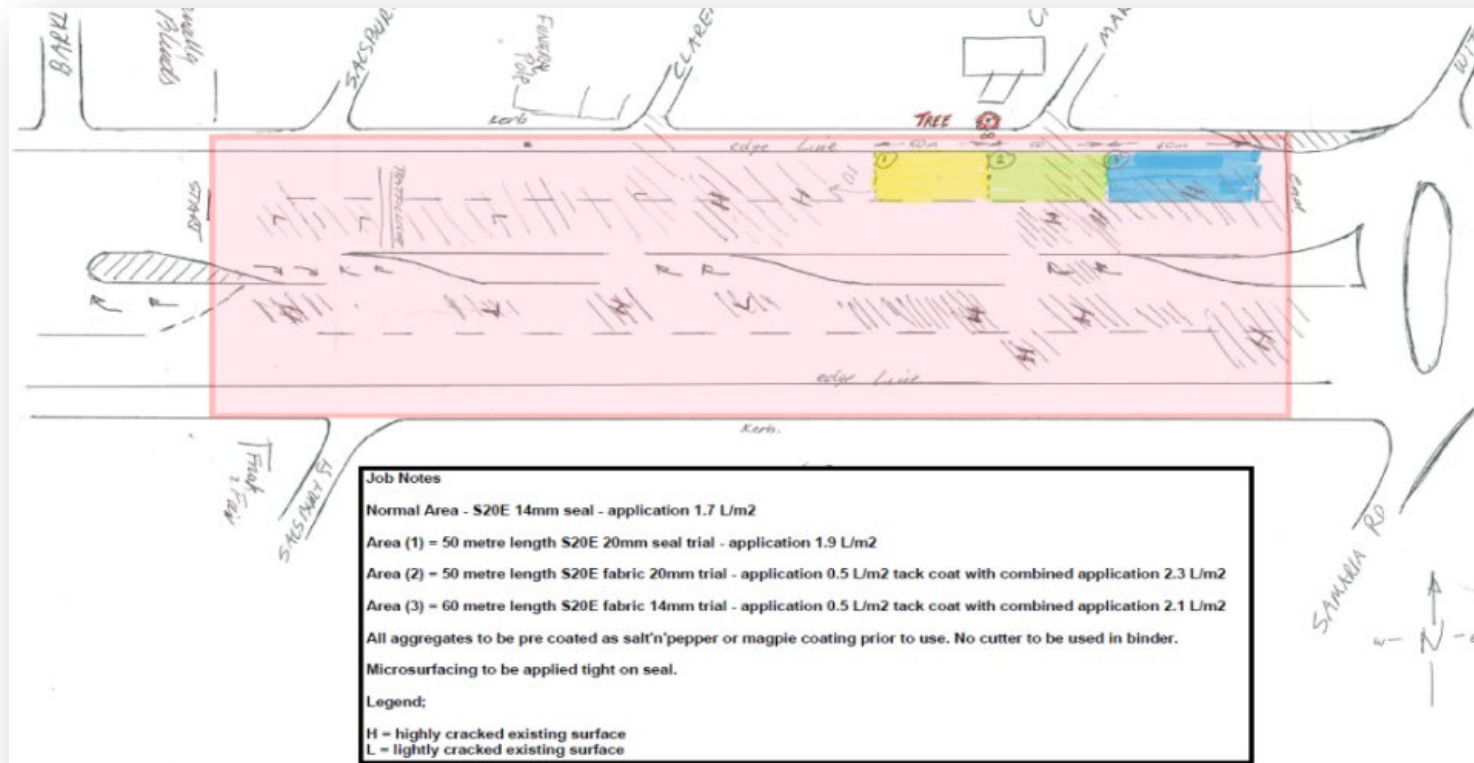


Project Special Features

The Works included very limited preparation works comprised of some minor patching and profiling of pavement shape.

The works also include trials of alternate treatments including use of 20mm aggregate in the spray seal and use of geotextile reinforced spray seal in areas of heavy existing block cracking.

Overview map of trial areas undertaken as part of the works



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Installing the seal February 2014



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Installing the Micro surfacing



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Completed Surface 2014



Works included replacement of all pavement line markings and pavement markers plus post surfacing sweeping. This photograph taken three weeks post completion of surfacing works showing resistance achieved to high toque actions on the new surfacing.



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Performance Review December 2019

Aesthetic review of the site undertaken in Dec 2019 shows the pavement in good condition.

Some areas exhibit minor reflective cracking and there is some binder flushing, however turning and screwing action of traffic have been resisted and the surface texture has been maintained. The site has been scheduled for a further flexible spray seal treatment this season to continue to maintain waterproofing of the pavement.



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Performance Review December 2019



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Performance Review December 2019



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Performance Review December 2019



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Performance Review December 2019



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Client Testimonial

From: Neville Adair
Sent: Wednesday, 18 December 2019 10:37 AM
To: Paul Price <Paul.Price@downergroup.com>
Subject: RE: ISSA Award submission - Benalla Cape Seal

G'Day Paul,

We in the North Eastern Maintenance Alliance (which is an Alliance between Regional Roads Victoria (Department of Transport of Transport Victoria) and Downer), fully support your submission for the ISSA Award.

This section of pavement has more than met our expectations in the preservation of the site.

The site is the gateway to the City of Benalla and has been a show piece for the rest of the State of Victoria.

The treatment has extended the life of the pavement also the cost for this treatment extended our budget for the year.

Many Shires and Councils have viewed this treatment and have arranged for the exact same treatment to be completed in their areas across Australia.

Good luck with your submission to the ISSA.

Kindest Regards

Neville Adair
Senior Works Officer - Projects
North Eastern Maintenance Alliance



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I acknowledge the Traditional Aboriginal Owners of Country throughout Victoria and pay my respect to Elders past and present and to the ongoing living culture of Aboriginal people.

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Submission Summary

In review of nominating criteria for the 2020 ISSA Preservation Performance award

1. The project was placed in February 2014 using a combination of preservation treatments (spray applied seal combined with Micro surfacing) with review undertaken in Dec 2019 for this submission.
2. The project was designed around specific mandates to improve pavement quality characteristics for waterproofing, road noise, resistance to turning and torque actions and overall aesthetics.
3. At review of the project approaching six years the delivered preservation treatments have been found to be successful for all mandates with the pavement still exhibiting improved pavement conditions when compared to former state prior to treatment as supported by client testimonial.
4. The use of Preservation treatments when compared to more traditional “mill and fill” asphalt were reported by the client as providing a direct cost saving of approx. 30% at the time of application.

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Submission Summary

Downer would like to thank the ISSA judging committee for considering this submission for acknowledgement.

We believe this project is a suitable candidate given the desired and achieved outcomes achieved from utilising Pavement Preservation treatments on a high profile site with very specific mandates measured over a five year span.

The site has been monitored through its life to date and been found highly suitable and shown to continue to provide improved pavement characteristics to stakeholders with no additional reactive or preventative treatments required to date.

Inhibition of surface cracking has been effective with only minor comparative reflection of pre-existing cracking and surfacing failures emerging through the delivered pavement surfacing. Pavement shape and ride have been maintained and the site is suitable for further preventative treatments to extend its life further mitigating more reactive type treatments and reducing whole of life costs.