2017 ISSA President Award Project Nomination
Microsurfacing - VicRoads State wide Contract

Submission from
Downer EDI Works
125 Somerton Road
Somerton, VIC, 3062, Australia
Applicant Information

This application is made on behalf of;
Downer EDI Works Pty Ltd
125 Somerton Road, Somerton, VIC, 3062
Victoria, Australia.

Submission for consideration of the 2017 ISSA President Award made by:

Paul Price – National Manager Pavement Preservation, recognising;

• Aydin Molokov – Project Manager
• Daniel Lawrence - Operations Manager
• Mark Parsons, Peter Saunders, Gerard McLean – Team Supervisors
• The highly skilled surfacing teams who worked on this contract &
• Our Contractor partners who supported the delivery of the works.
Project Overview & Scope

Scope

- All sites for State Government arterial network including interstate highways and rural routes
- Application of Microsurfacing to improve specified sites shape and ride quality. Predominantly two coat applications to correct wheel path deformations (ruts) and ride using 7mm (Type III) material.
- Provision for all required traffic management for works including advance notice of works using variable message boards (three days prior minimum) and the use of mobile truck mounted attenuators on specified freeway sites.
- Reinstate all pavement markings to sites including audio-tactile line marking within mandated time frames (within five days post surfacing).
- Applications across three state road authority regions including 42 separate sites, with completion time lines applicable. All works to be completed between November 2015 and April 2016.
- Some sites in environmentally / heritage sensitive and significant areas.
- Some existing sites required to have excess binder present removed prior to overlay using high pressure water blasting prior to overlay.
Project Overview and Scope - Video
VicRoads manages the Victorian arterial road network and its use as an integral part of the overall transport system.

**VicRoads aims are to:**

1) achieve ongoing reductions in the number and severity of road crashes and the resultant cost of road trauma

2) assist economic and regional development by managing and improving the effectiveness and efficiency of the road transport system

3) develop a more integrated and sustainable road transport system

4) minimise the impact of roads and traffic on the community and enhance the environment through the responsible planning and management of the transport system

5) build effective, equitable and efficient relationships with all customers by providing them with convenient access to services that meet their needs and enable VicRoads to deliver cost effective services to the community
Project Expectations

Vic Roads have contracted the use of microsurfacing within their network based on the following deliverable expectations;

1. Pavement ride and roughness reduction (primary reason). Single coat and double coat applications specified targeting this primary goal.
2. Wheel path rut regulation and pavement drainage improvement.
3. Surface regulation of patched pavements to provide a uniform final surface texture.
4. Extend the life of the network pavement in an economically effective method.
5. Provide a uniform final surfacing providing the travelling public a safe and suitable pavement for use.
6. Contract mandate requiring full quality assurance and defect liability period of 24 months on all works.
## Project Timelines

<table>
<thead>
<tr>
<th>Contract</th>
<th>VicRoads Western and Northern</th>
<th>VicRoads South Western</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project tender called</td>
<td>23rd October 2015</td>
<td>3rd December 2015</td>
</tr>
<tr>
<td>Tender close date</td>
<td>7th October 2015</td>
<td>18th December 2015</td>
</tr>
<tr>
<td>Contract awarded</td>
<td>16th November 2015</td>
<td>5th January 2016</td>
</tr>
<tr>
<td>Work commenced</td>
<td>30th November 2015</td>
<td>2nd February 2016</td>
</tr>
<tr>
<td>Actual completion</td>
<td>21st January 2016</td>
<td>14th April 2016</td>
</tr>
<tr>
<td>Mandated contract completion</td>
<td>8th February 2016</td>
<td>15th April 2016</td>
</tr>
</tbody>
</table>

*Example of gantt chart style program submitted to client for approval*
Project Eligibility for Award

In regard to the judgement criteria, application for this project to be considered is based on the following

1. **Safety** – this project was completed with no recordable safety or environmental incidents.

2. **Completion Date** – this project was completed within contractual specified timeframes.

3. **Subcontracting of Works** – all Pavement Preservation techniques in relation to this project were completed solely by Downer EDI Works Pty Ltd.

4. **Project complexity** – complexity around the project related to;
   
   • Geographic separation of sites required.
   • Multiple mix designs and raw material supply points.
   • Capability to service in mandated time frames.
   • Project management of multiple suppliers.
   • Delivery of all contract requirements for network stakeholder notifications and post surfacing activities such as line marking.
About Downer

OUR PURPOSE
We exist to create and sustain the modern environment by building trusted relationships with our public and private sector customers.

OUR PROMISE
To work closely with our customers to help them succeed, using world leading insights and solutions.

Our business is founded on four pillars which support our Promise and our Purpose.

OUR PILLARS

Safety
Zero Harm is embedded in Downer’s culture and is fundamental to the company’s future success.

Delivery
We build trust by delivering on our promises with excellence while focusing on safety, value for money and efficiency.

Relationships
We collaborate to build and sustain enduring relationships based on trust and integrity.

Thought leadership
We remain at the forefront of our industry by employing the best people and having the courage to challenge the status quo.
Project Safety Considerations

1. Traffic Management

This project involved works on a variety of roads including interstate freeways, significant tourist routes and remote arterial roads.

Solutions implemented in this project to manage traffic included:

- Use of a minimum of two portable Variable Message Boards on every site to inform and communicate with motorists, which included delivery, setup and maintenance in advance of surfacing works.

- Provision of site specific traffic management plans for all sites, with over 50 individual plans required, including an independent desktop audit and two implementation audits.

- Use of cone (pod) trucks for safe placement minimizing exposure to workers on foot.

- Use of Truck Mounted Attenuators on all freeway classed roads for both Microsurfacing and other ancillary works.

- Placement and maintenance of aftercare signage post works warning motorists of changed conditions prior to line marking reinstatements.
Project Safety Considerations – Traffic Management

Drop deck pod truck – operator is harnessed into the drop deck of the vehicle, enabling the safe placement and pickup of traffic cones, moving the operator away from the line of fire.

Variable Message Signs – a requirement for each site to warn motorists of works, working with VicRoads to meet its customer focused objectives. In addition, variable speed limits were trialled to reduce motorists speed.

Example of site specific traffic management plan (double click to open)

Truck Mounted Attenuator as required for freeway sites.
2. Zero Harm Initiatives

- Downer recognized that crew engagement was an issue in such large projects. As part of these works, an interactive system was implemented with the crews to discuss daily risks and hazards in conjunction with daily scope of works updates. This included using chalk markers on van windows to provide an effective communication method at daily pre starts to communicate pictorially to teams the days plan and hazards.

- Crews were trained in the initiative surrounding hazards associated with plant and pedestrian interactions and reversing vehicles. The Red Zone initiative included a 10m exclusion zone implemented around mobile plant.

- Implementation of near miss reporting using a dial in hotline to report near misses and allow this data to be captured. This Free Call hotline communicated to encourage employee feedback and reporting of any near miss events.
Project Safety Considerations

**Safety**

*Zero Harm is embedded in Downer’s culture and is fundamental to the company’s future success*

**Thought leadership** - use of crew van windows to convey effective job planning, prestart and safety information. Highly commended by VicRoads

**Near Miss Reporting Hotline** – implementation of Near Miss reporting hotline on this project. Aim to collect as much data as possible from near miss’ and implement actions to prevent incidents from occurring.

Graph above illustrates near miss calls (blue) vs injury frequency rate (green) over a year period throughout the Downer roads business.
Project Safety Considerations

Mission possible – implementation of ‘RED ZONE’:

This National Downer Roads initiative implemented to establish personnel are to be 10m clear from any piece of plant and equipment in the direction of travel.

Aim is to eliminate plant pedestrian / “worker on foot” interface incidents.
Project Delivery - logistics

- Use of three Bergkamp M1 continuous paver crews for the project.
- Over 60 individual pieces of plant and equipment required, all requiring inspection and approval by the end client prior to commencing works.
- Approximately 70 personnel required for project, all requiring company and client inductions (2-3 hours per person each).
- Extensive haulage of raw materials – use of large truck combinations to increase haulage capability.
- Road side stock pile locations planned and approved by client prior to use as well as managed for heritage and environmental concerns.
Project Challenges

The project involved the delivery of Microsurfacing over geographically isolated locations, presenting challenges such as:

- Lack of suitable stockpile locations within close proximity to work sites.
- Considerations such as crew accommodation.
- Supply of potable water for works given remote locations and drought conditions.
- Use of multiple mix design sources, with large haulage distances.
- Works on culturally and environmentally sensitive areas such as the Great Ocean Road (a major Victorian tourist attraction).
- Tight client set project practical completion dates (12 weeks from acceptance of tender).

Great Ocean Road – High profile tourist and environmentally sensitive locations formed part of the works.
## Project Schedule

Double click on schedule extract below to open PDF copy of schedule

<table>
<thead>
<tr>
<th>Job No</th>
<th>Road Name/Locality</th>
<th>Lane</th>
<th>Length (m)</th>
<th>Grade (m)</th>
<th>Underground (m)</th>
<th>Earthwork (m)</th>
<th>Overhead (m)</th>
<th>Overburden (m)</th>
<th>TVC</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Seymour Foolsee Rd</td>
<td>Lane</td>
<td>3,500</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.2</td>
<td>College Milled Rd</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.3</td>
<td>Middle Milled Rd</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.4</td>
<td>Extension Road</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.5</td>
<td>Additional Road</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.6</td>
<td>Extension Road</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.7</td>
<td>Western Hwy (Adelaide End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.8</td>
<td>Western Hwy (West End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.9</td>
<td>Western Hwy (West End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.10</td>
<td>Western Hwy (West End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.11</td>
<td>Western Hwy (West End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.12</td>
<td>Western Hwy (South End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.13</td>
<td>Western Hwy (South End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
<tr>
<td>1.14</td>
<td>Western Hwy (South End)</td>
<td>Lane</td>
<td>3,000</td>
<td>0.5</td>
<td>0.1</td>
<td>1,000</td>
<td>0.5</td>
<td>0.8</td>
<td>11</td>
<td>2.02</td>
</tr>
</tbody>
</table>
Project Designs and QA

All Microsurfacing Designs completed at the Downer National Research and Development Laboratory, including the provision of VicRoads approvals.

- Three separate Microsurfacing Designs used for the project.
- All Designs inclusive of Downer SFT (suspended fibre technology).
- Emulsion formulation and manufacturing / supply in house from Downer emulsion plant.
- Extensive quality assurance regime required under the contract, including
  - Sampling of raw material prior to release to confirm conformance to specification for all aggregates and emulsion supplied.
  - Sampling of Microsurfacing (aggregate and emulsion) at specified intervals tested for residual binder and gradation.
  - Results typically provided to client within 7 days of works completion to facilitate claim summary approval for works payment.
All mix designs based on use of High Binder Emulsion content (67%), inclusion of Suspended Fibre Technology and compliance to residual binder softening point.

Double click on each design to open a full copy including aggregate properties compliance and relevant VicRoads approvals.
Project Delivery – Sampling and QA

**Sampling** – sampling of raw material ex on site stockpile for compliance testing

**QA testing results** – example of QA results produced confirming binder content and grading of produced mix

**Sampling** – Microsurfacing Mix Sample LHS, operator preparing to take sample RHS

---

**Inspection and Test Plan above** – example page of inspection and test plan developed for the project

---

**Delivery**

We build trust by delivering on our promises with **excellence** while focusing on safety, value for money and efficiency.
- The project involved works across three separate VicRoads regions, with coordination of individual region priorities and requirements needed. Programming was required mindful also of client preparation works being completed prior to Microsurfacing overlay.

- A number of jobs had time sensitive completion dates to ensure all works were completed in preparation for either future sealing or anticipated cooler weather.

- The works involved coordination with multiple business partners and suppliers to ensure required logistics to run three M1 crews.

This included careful planning of delivery schedules for

- Subcontractor partner used for the entire requirements for management of traffic. This included provision of equipment resources to cater for the diversity in the works.

- Raw material supplies to coordinate with road side timing to meet crews.

- Erecting and placing VMS boards to meet timing for works.

- Post surfacing activities required such as line marking.
Feedback from Mark McFadden – VicRoads South Western Region

Downer’s performance in the delivery of works in Contract 8929/15-16/006 was outstanding, the South West Alliance was impressed with the overall management, and successful delivery of the micro surfacing throughout the region.

Downer’s resources were always observed to be adequate throughout the Contract period, aided by dedicated Project Management Team and Site Supervisor who ensured adherence to Quality, OH&S and Environmental Management.

Feedback from Peter Gibbs – Vic Roads Northern Region

Downer’s performance and management of works completed within VicRoads Northern Region on Contract 9193 during the 2015/2016 was of an excellent standard. We were particularly impressed with the innovative pre-start toolbox meeting, where the windows of the staff bus were utilised as a white board for drawing the day’s events and hazards, there for all to see and reference if needed.
Project Thought Leadership

Thought leadership

We remain at the forefront of our industry by employing the best people and having the courage to challenge the status quo.

Use of High binder emulsions and multiple aggregate sources provided the most efficient haulage and economical delivery of works.

Delivery programming needing to account for tourism periods, site preparation works being completed, supply logistics coordination and overall contract completion dates.

Appointment of single dedicated Project Manager to oversee whole of works planning and programming.

Sharing of existing resources coupled with externally sourced enabling increased overall capability to deliver.

Programming of two coat applications across multiple shifts ensuring traffic between layers, mitigating any risk of lamination of microsurfacing via full cure between layers.

Sub contractor / supplier providers working as “delivery partners” facilitated ownership in the overall contract delivery toward common goals.
Project References

**Vic Roads South Western Region**

Mark McFadden  
Improvements & Surfacing Officer  
Ph: (+61)35561 9217  Mob: 0407 052 758  
E-mail: mark.mcfadden@roads.vic.gov.au

**Vic Roads Northern Region**

Peter Gibbs  
Senior Maintenance Officer  
Ph: (+61)354345066 Mob: (+61) 419888445  
E-mail: peter.gibbs@roads.vic.gov.au

**Vic Roads Western Region**

Brian Wright  
Team Leader Asset Management  
Ph. (+61)53338771 Mob. (+61)476803637  
E-mail: brian.wright@roads.vic.gov.au
Project Photos – works in progress
Project Photos – works in progress
Project Photos – completed job
Use of long ski attached to paving screed offer best opportunity to improve pavement ride by averaging existing pavement irregularities.
Project Photos – before vs after
Project Photos – preparation works.

Wheel Path excess surface binder pre treated with high pressure water blasting prior to overlay to mitigate future surface flushing.

Picture showing treated (left) versus untreated (right)
Project Photos – completed job

Geelong – Portarlington Road
Photo taken approximately one year post surfacing
Project Outcomes - Summary

• All work was delivered within mandated time frames with surfacing works completed ahead of completion mandates.

• All works were delivered meeting Quality assurance requirements with no recorded defects or omissions at contract completion or to present.

• Client objectives for pavement ride and shape improvement were delivered. At the time of this submission network data was not available on completed works, however historical data provided by Vic Roads shows microsurfacing delivers an average roughness reduction of 23 NRM per site treated.

• All works were delivered without safety or environmental incident.

• Delivery of works was equivalent across three paving crews with no reportable or discernible difference in material QA or workmanship across various teams and supply points.

• All sites delivered have provided a uniform final surfacing providing a “blank canvas” for future resealing. This ensures the ability for correct and consistent spray application rates for spray seal mitigating risk of binder flushing or excess surface binder pooling.
Award Nomination Summary

This project has been nominated for the 2017 ISSA Presidents Award for Excellence as it showcases;

- High quality results achievable using microsurfacing to the disciplines of the ISSA.
- The quality and value achieved by an asset managing road authority using microsurfacing to extend and improve the characteristics of their network asset.
- A deliverable contract with complexity and high quality assurance outcomes for all aspects of the scope of works required.
- A contract delivered on time, within budget and without and safety or environmental impacts.
- A contract delivered aligned to the Downer client promise supported by our pillars for conduct.

We believe this contract to be a suitable candidate for consideration for recognition by the ISSA.

We would like to thank the ISSA judging committee in advance for time in considering this contract.