CEO'S REPORT

BY GREG WHITE

CEO Greg White

This is my last report as CEO of AustStab as I have just announced my retirement and I think this allows me an opportunity to reflect on the state of the stabilisation industry and its recent progress.

My background was in the asphalt and concrete pavement industries, so on my appointment to AustStab some five years ago meant I needed to enter a fast learning curve.

Talking to the industry brought up many aspects to stabilisation of which I was completely unaware. I made up my mind to concentrate on a few of aspects that required action.

My predecessor had established a strong industry association with specifications, an informative website, an accreditation scheme and a training strategy. AustStab was well represented with road agencies, Austroads, councils and the general pavement industry. The emphasis had to be to build on this strong base.

It was as important to look at the negatives regarding stabilisation as well as the positives. Many people had experienced or heard of poor results using stabilisation especially in the early stages of development in Australia. This is always a problem with a new process, where stabilisation was blamed for poor results rather than the inferior design or construction.

Stabilisation is a relatively young industry in Australia, established professionally in the 1960s. Then the basic equipment available, restricted binder options, lack of specifications and inadequate knowledge of some practitioners resulted in sub-standard results at times.

However, many pioneers both in the road agencies and the construction industry persevered with stabilisation as they could see its great potential. Over the subsequent years, research and on-site developments were progressing rapidly. This together with the introduction of more sophisticated and powerful plant and a broad range of suitable binders lead to vastly improved and reliable outcomes. As a result, all state road agencies greatly increased their use of stabilisation to achieve high quality rehabilitation by recycling the failed pavements.

The major tasks as agreed after discussions with AustStab members were to:

- Establish a third party Accreditation Scheme;
- Have a regular segment on Stabilisation in the ROADS magazine;
- Offer universities lectures on stabilisation;
- Conduct joint venture stabilisation courses with CPEE;
- Republish the Guide to Stabilisation in Roadworks;
- Work closely with Austroads and ARRB to carry out further research on Stabilisation; and
- Encourage all stabilising contractors to abide by the AustStab Code of Ethics.

AustStab's Council were convinced if these measures were introduced, and we built on AustStab's existing reputation as the industry peak body, then the industry would grow as more specifiers were made aware of the financial and environmental benefits of stabilisation.

Three aspects of the Australian road industry have propelled stabilisation into the preferred rehabilitation process in a vast number of cases.

The first is a greater awareness that the recycling of failed existing pavements is good for the environment;

Then there is the reduced availability of good quality quarry pavement materials due to quarries reaching the end of their life and environmental factors discouraging the development of new quarries close to population areas.

And the increased need to rehabilitate Australia's ageing road network to allow an increased traffic load due to our expanding economy, especially in mining and agriculture.

This has been exacerbated over the last few years by many floods on the eastern seaboard. It was found that stabilisation was the only viable solution to pavement rehabilitation as it was by far the most economic and caused the least traffic disruption.

I am sure stabilisation will grow rapidly over the coming years as more and more engineers are confident in the process. I wish Leah Fisher well in her new role as CEO; I know the members and the construction industry will continue to support AustStab and grow the industry.

I would like to take this opportunity of thanking the many people who have assisted and guided me over the last five years. Many people have been very generous with their time and patience especially the road agencies, ARRB, Austroads and our many members. The AustStab council, especially the various presidents and vice presidents, have been highly supportive and this has contributed greatly to the stabilisation industry's strength and rapid growth.

Editor's note: *Roads and Civil Works Magazine would like to thank and recognise Greg White for his contribution to AustStab, in particular, and the stabilisation industry.*

The AustStab Segment in the magazine had its origins in a conversation and coffee at a café in Melbourne's south eastern suburbs and the relationship between the magazine staff and Greg has always been positive and friendly.

We wish Greg well in his future endeavours and would also like to congratulate Leah Fisher on assuming the CEO's role.

Roads and Civil Works has worked closely with Leah since AustStab's segment first appeared in the magazine and we look forward to the association growing stronger over the years ahead.

PRESIDENT'S MESSAGE

BY HEATH CURNOW

President
Heath Curnow

With a successful 2014 AGM held in NSW's Hunter Valley, AustStab is now focussed on the 2015 year ahead. Those who attended I trust have come away better informed on all industry matters and enjoyed the fine dining and prizes from the various awards provided by our sponsors, Caterpillar and Wirtgen.

I would like to thank all those who attended for their input and particularly Greg and Leah for their efforts in putting together another smoothly run AGM. Even the golf team selection and judgement was thrown open for anyone to win this year. I look forward to my third year as the President (2014 – 2015) and continuing to work closely with David Berg as Vice- President.

During the next 12 months AustStab will to continue to set itself apart as the expert in the area of pavement recycling and stabilisation. The members provided some clear objectives for the coming period, which continue to support the founding pillars of the association:

- continue to seek recognition by all state road agencies for acceptance of the robust AustStab-ARRB accreditation scheme, and continue to strengthen the recognition of the importance of the scheme;
- continue to engage with directed projects with universities, Austroads, ARRB and industry in furthering the knowledge of the industry in stabilisation and pavement recycling through education and research;
- review the Strategic Plan for the association and ensure our continued recognition as an international expert in stabilisation and pavement recycling while remaining vitally relevant to our members;
- ensure that sustainability and safety remain at the forefront of every discussion involving stabilisation; and
- ensure a sustainable financial future for the association.

With membership continuing to grow for AustStab, our annual conference becomes more and more relevant to the industry. This year the council welcomed three newly elected members to the table; Greg Jenkyns - Austroad Stabiliser, Mark Pilgrim - Mid Coast Road Services and David Scicluna - Accurate Asphalt and Road Repairs.

I thank Leah and Greg for providing a great forum at the annual conference for networking and healthy discussion with contractors, construction material suppliers, as well as the equipment manufacturers. We were greatly supported by Caterpillar and Wirtgen who sponsored functions within the three-day conference, as outlined in the Conference Overview and Awards of Excellence Overview contained in later articles.

The judges on this year's Awards of Excellence panel were overwhelmed by the merit, effort and diversity shown by the winners of this year's awards. I hope you will take the time to read the value that this year's winners placed on their involvement in the stabilisation industry in the articles showcased in this edition of the magazine. The Highly Commended winners and finalists stories are available by accessing the AustStab website.

"The judges on this year's Awards of Excellence panel were overwhelmed by the merit, effort and diversity shown by the winners of this year's awards."

I thank AJ Lee and Caterpillar for their professionalism and enthusiasm and involvement in sponsoring the Awards. I also wish AJ well as he returns to the USA later this year, and look forward to working closely with Chris Powell from Caterpillar in future years.

We felt privileged as an association to welcome Max Wallis and Paul Keane as the newest Honorary Members for their many years of contribution to the industry as a whole.

As you have read in Greg's report he has decided to retire this year. I would like to take the opportunity to thank Greg White for his commitment to AustStab over the past five years for his leadership, humour and dedication to furthering the AustStab message.

Greg came to the association with a wealth of knowledge in pavements and construction materials, with an exceptional ability to market both the association and the process of stabilisation and recycling. It has been a pleasure to work with Greg during my time both as Vice-President and President of AustStab.

I wish Greg, Liz and their family great success with whatever their next choice of adventure is and will appreciate his continuing commitment to AustStab, as his retirement allows. It is pleasing that Greg has agreed to stay on to contribute to the Austroads committees, and I and my fellow directors will continue to benefit from his counsel, humour and knowledge. The members will miss his input.

I warmly welcome, on behalf of my fellow directors and members, Leah Fisher to the position of CEO. Leah has worked closely with AustStab over the last four years in the role as Executive Officer, with a special interest in the Victorian businesses during her time in Melbourne, and I do forgive her for her support of the Hawthorn Hawks.

She came to the business with a diverse set of skills gained through her nearly 20 years contract and general management in the construction industry, initially with Boral and then later with a variety of civil contractors. Leah provides a new set of skills to our organisation, currently with a particular passion for our accreditation scheme and Awards of Excellence.

2014 AUSTSTAB CONFERENCE OVERVIEW

Foreboding skies welcomed the record number of delegates to the 19th annual AGM for AustStab on the golf course of the Crowne Plaza Hunter Valley.

Thankfully, the weather was not indicative of the open and healthy discussions that continued over a three-day period. It was, however, to provide a contentious Wirtgen Golf Cup outcome. Based on a count-back over two holes, the cup was taken home by Brad Brown, Heath Curnow, Mark Pilgrim and Craig Yates.

A review of the progress on national recognition of the AustStab ARRB Accreditation scheme, specification reviews in New South Wales, Queensland, Victoria and Western Australia by the state road agencies also featured as a discussion topic.

A presentation by Skills DMC provided AustStab with clear directions regarding the funding and approval process for recognition of competency assessment throughout Australia. Time was spent setting a direction for the next financial year during what are predicted to be challenging times with difficult state elections and the massive reduction in flood recovery funding coming to the fore.

The AustStab Council welcomed three new members to the ranks with Greg Jenkyns (Ausroads Stabilisers), Mark Pilgrim (MCRS) and David Scicluna (Accurate Asphalt and Road Repairs), joining the Council of 2013-2014. Greg White has chosen to reduce his time with AustStab and will step aside from the CEO role. The Council welcomed Leah Fisher to this role.

The annual Gala Dinner, was a great success with a record number of attendees, including the Awards of Excellence finalists.

This year the association was delighted to recognise the life-long contributions of two key individuals for the stabilisation industry. The awards were accepted by Paul Keane and Max Wallis (in absentia). More information about the valuable contribution made by these two men can be found on the AustStab website.

Back Row: Stewart Geeves (Andrew Walter Constructions), Warwick Dingle (Wagners Cement), John Boocock (Hiway Stabilizers Australia), Ashley Allridge proxy for Mark Wasley (RoadTek), Pat Capaan (Downer), Mark Pilgrim (MCRS), Tom Curnow (Stablico) Greg White (CEO 2010 - 2014)

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AUSTSTAB AWARDS OF EXCELLENCE CONTINUE TO REVEAL DIVERSE STABILISATION PROJECTS

The 2014 AustStab Awards of Excellence, sponsored by Caterpillar, continue to reveal the diverse range of environments in which stabilisation is being adopted throughout Australia.

Nominations were received from all east coast states with winners from New South Wales, Queensland and Victoria.

The judges were pleased by the diversity of the environments in which stabilisation is being adopted and showcased through the award nominations process. Highly respected clients such as Queensland Department of Main Roads and Transport, Melbourne Airport and Mildura Rural City Council were included in the long list of clients for the projects.

Funding for the nominations came from varied sources such as the University of Technology, Federal Flood Recovery funding and self-funded initiatives, such as Ausroads and Accurate Asphalt and Road Repairs.

That funding encouraged the judging panel that not only are massive steps being taken by industry, but also by our industry partners, in supporting the stabilisation and pavement recycling industry in Australia.

The stories that have been shared through this year's award winners highlight the continuing progression and professionalism that the stabilisation sector is expected to deliver by our industry partners. The award finalists and highly commended winners stories are also inspirational.

The finalists and highly commended winners in this year's awards were:

Category One: Work Health and Safety

Highly Commended: FK Gardiner and Sons Pty Ltd: 100 Days of Safety.

Finalists: Accurate Asphalt and Road Repairs Pty Ltd: Cultural Change through the implementation of accredited safe work systems.

FK Gardiner and Sons Pty Ltd: Gore Highway – Building Sustainability for the Future.

Category Two: Excellence in Research or Education

Highly Commended: Reuben Royce Lucero - Effect of Using Lime to mellow clay subgrades in low trafficked road pavements.

Category Three: Innovation or Excellence in Sustainability in pavement stabilisation

Highly Commended: QRCG – Great Alpine Road, Bruthen Rehabilitation.

The City of Gold Coast – Sustainable Pavement Management.

Finalist: King and Campbell – Glenview Park, Yippin Creek.

Category Four: Excellence in Recycling in stabilised pavements in local government

Highly Commended: The City of Gold Coast – Pavement Recycle.

Finalist: Mildura Rural City Council – NDRRA Flood Recovery Program.

For more information about the award finalists and Highly Commended winners, go to the AustStab website at www.auststab.com.au

2014 AustStab Awards for Excellence Winners - AJ Lee (Caterpillar), Peter McDowell (Negri Contractors (Vic)), Greg Jenkyns (Ausroad Stabiliser), Todd Huuskes (Wollongong City Council), Andrew Middleton (Stabilised Pavements of Australia), Heath Curnow - AustStab President (Stabillime)

AUSROADS SETS BENCHMARK MEETING COMPETENCY NEEDS

Ausroads Stabilisers is a Queensland-based company located at Forest Glen on the Sunshine Coast. The company has been in operation four years and operates a fleet of stabilisers and spreaders.

Over the past twelve months, Ausroads has been instrumental in developing the course *RIIRC309A Conduct Stabiliser Operations* for the stabilising industry to identify the process of stabilisation works and the operation of various reclaiming stabilisers.

The stabilising industry as a whole has been talking of developing the course for some time now. Ausroads took the initiative in July 2013 to team up with Tama Robson (Australian Institute of Resource Training) and Paul Conquest (Face to Face Training) to start developing the *RIICRC309A Conduct Stabiliser Operation* course. At the time, an approach was adopted so that course matter and assessment would be relevant industry-wide.

Tama Robson from AIRT was employed to develop the course and to ascertain from the operators firsthand how they were operating and what obstacles presented barriers to them progressing with their skills. Tama Robson worked with Allen Timms (Ausroads' Trainer and Assessor) and Paul Conquest on the development phase of the training package. Face to Face agreed to fund the development of the package and, over the next three months, the project came to fruition.

To ensure the package was fit-for-purpose, a subject matter expert was required in the development and implementation phase. To do this they worked with Scott Bell (Stabilising Supervisor, Ausroads Stabilisers) whose stabilising industry experience of 20 years provided the necessary knowledge base needed. In late August 2013, Tama Robson worked with Scott Bell and Allen Timms on site to see the machines in operation and interview the operators to ensure the training fitted the requirements to be nationally accredited. Photographs and video were also recorded at the time for inclusion in the course material.

In late September 2013, the *Conduct Stabiliser Operation* course was finalised and validated.

The course is divided into seven key areas that meet the needs of the Stabilising Industry as a whole:

- The meaning of road/soil stabilisation;
- Plan & prepare;
- Conduct pre-operational checks;
- Operation of the stabiliser;
- Relocation of the stabiliser;
- Carry out operator maintenance; and
- Clean up work area after stabilisation.

December of 2014 marked the start of the program with the first of the learners' guides being rolled out to a number of stabiliser operators from Ausroads Stabilisers. In late January, Mark Muscat (Face to Face Training), Allan Timms and Scott Bell completed the first theory and practical assessment in Roma Queensland. This marked the successful completion of the first operators to be assessed with the RIICRC309A Conduct Stabiliser Operations. Ausroads Stabilisers then continued for the next few months to train and assess further operators in accordance with the RIICRC309A.

Ausroads Stabilisers is the first in the stabilising industry on the east coast of Australia to have successfully trained and assessed operators to the *RIICRC309A Conduct Stabiliser Operations* qualification. Although qualified, the operators are scheduled to be reassessed every 12 months so that Ausroads maintains its Workplace Health and Safety obligations to have suitable trained staff. Other organisations have identified that they have completed competency assessment, but none have publically declared compliance with the *RIICRC309A.*

The *Conduct Stabilising Operations* course is beneficial to Ausroads Stabilisers and to the industry as a whole. It gives the employer the satisfaction of knowing that operators have a working knowledge of Workplace Health and Safety and its relevance to stabilising operations, and that they can make sound and educated decisions on a day-to-day basis. Their skills and knowledge base is broadened along with their operational awareness. In short, it creates efficiencies through greater Operator autonomy.

Ausroads Stabiliser has strived to be innovators in the stabilising industry with the development and implementation of the *RIICRC309A Conduct Stabiliser Operations* course and has committed to the industry's future success.

Ausroads Stabiliser was recognised as the winner for the category for Excellence in Education or Research at the 2014 AustStab Awards of Excellence.

TIPES - POLYROAD ALONG TO ROAD TO NATIONAL RECOGNITION

In February 2014, Polyroad Stabillising, an AustStab member, began the evaluation process with ARRB's Transport Infrastructure Product Evaluation Scheme (TIPES) for Polyroad.

Polyroad is a product that claims to be designed to preserve the existing dry strength of the pavement and resist the ingress of water. TIPES is a technical evaluation scheme for products outside the scope of established standards and specifications. AustStab looks forward to seeing the outcomes of the process.

ARRB Group defines itself as a trusted advisor to road agencies. It provides research, consulting and information services. ARRB Group is involved with AustStab as an industry partner in administering the AustStab ARRB Contractor Accreditation Scheme for Stabilisation Contractors, which is now commencing the first round of periodic follow-up audits.

According to ARRB, TIPES is intended for the assessment of road pavement construction products. In February 2014, the initiative was endorsed by the TMR in Queensland, as well as the road agencies in South Australia, Tasmania and the Northern Territory. AustStab has provided endorsement for the process for products that are incorporated for pavement construction using centrally mounted mixers with moisture control.

The process is rigorous and repeatable. The products are evaluated by an expert panel, which will include an independent technical expert as well as the product evaluation panel - appointed by ARRB. Testing will be completed by a registered testing authority.

It requires the product's proponent to describe the claims for the product. The product then proceeds through a three-stage process of evaluation, testing and trials.

At the end of the process a Technical Opinion, created by the product evaluation panel will be recorded on the Register.

AustStab welcomes the process that will aid consumers in ensuring they will purchase products that are fit-for-purpose, and potentially remove from the market all products that are affectionately referred to as "snake oils".

We continue to encourage the use of centrally mounted mixers with moisture control as being a fundamental to the proper incorporation of binders to pavements.

AustStab welcomes any initiative that further enables the consistent design of pavements incorporating all types of binders, as are currently in place for binders such as lime, cement, blends and bituminous products.

FOAMED BITUMEN RECOGNISED FOR CONTINUING INITIATIVES IN SAFETY

Providing a safe and healthy workplace for workers, clients, visitors and the general public is a primary goal and legislative requirement for all employers.

The key to achieving this is through the implementation of practical and effective means of risk management that enable workers to identify hazards within the workplace and actively contribute towards continuous improvement through appropriate consultative mechanisms.

At Stabilised Pavements of Australia Pty Ltd (SPA), the hazard identification process, along with corrective action procedures, have led to the reduction of a significant hazard that is common to its workplace in relation to foamed bitumen pavement rehabilitation.

Foamed bitumen construction material inputs include the use of a foaming agent which assists to achieve the product standard related outputs of both expansion ratio and half-life of the foamed bitumen binder. The foaming agent currently used throughout the industry poses a potential risk in relation to handling, transport and storage.

As part of a continual commitment to improving workplace health and safety, SPA embarked on a journey to reduce the hazards present within its workplace from the use of foaming agents.

The current foaming agent is classified as a Dangerous Good and Hazardous Substance under the new Work Health and Safety (WHS) Regulations based on the United Nations' Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

Hazards that are presented by the current industry foaming agent were identified through several means arising from various sections of operations at SPA including:

- Hazard reports;
- Incident reports;
- Consultation with experienced field staff; and
- Management input.

The current foaming agent is deemed a Hazardous Substance and is classed as a Class 3 Flammable Liquid due to having a flashpoint of 35°C. This poses a risk during foamed bitumen stabilisation as the hot bitumen is approximately 180°C and ambient temperatures in work environments in

Australia can reach 40°C.

This agent is classified as a Dangerous Good for the purpose of transport

by road or rail, and it is safe to only store and transport up to 1000L/tank. The strong odour reportedly resulted in drowsiness and dizziness.

Current methods used by SPA to control the hazards presented by this material within operations included the following means:

- Risk assessment of substance;

Stabilised Pavements of Australia incorporating foaming agent into the bitumen

- Utilisation of licensed subcontractor to transport the material in accordance with the Dangerous Goods Code;
- Administrative limitations on maximum storage quantities and storage methods;
- Engineering controls for transfer of the material from the conventional storage vessel (200Lt drum) and into the application vessel (registered bitumen trailer);
- PPE for handling; and
- Emergency response provisions.

In accordance with AS/NZS 4801:2001 (Occupational Health and Safety Management Systems), hazard controls are classified into the "hierarchy of controls" from preferred (elimination), to the least desirable as follows:

- Elimination;
- Substitution;
- Engineering controls;
- Administrative controls (procedural); and
- PPE.

SPA undertook a review of the hierarchy of controls to determine the most suitable method to limit this hazard in relation to the residual risk posed within the workplace and commenced with a review of opportunities for elimination.

Unfortunately as the foaming agent is a contractual requirement in accordance with quality related product standards through specification, elimination was not an immediate option. Substitution was seen as a potential option and would be dependent on the ability of industry to provide a product that reduced the hazards without impacting on the quality related requirements.

Through existing knowledge of industry suppliers, SPA engaged in discussions with Interchem as the proposed supplier for an alternative foaming agent. In order to determine the suitability of an alternate material to act as a foaming agent, SPA needed to identify and communicate applicable parameters including:

- **Existing Product Material Composition/Properties;**
  - Identifying the reasons that the existing material is classified as both a hazardous substance and dangerous good, thus ensuring that these properties are mitigated in an alternate material;
- **Product Standard Requirements;**
  - Ensuring the bitumen foaming additive complies with various state road authority specifications
  - The foaming agent produces bitumen foaming properties of minimum expansion ratio of 10 times the original volume and a minimum half-life of 20 seconds
- **Handling and Application;**
  - Investigating how the product is transported, stored and used within the construction process to ensure the alternate material does not pose any new hazards and remains practical for use in the field.

This outcome was achieved through a series of meetings in which the above information was discussed and reviewed to enable the material provider a thorough understanding of the product requirements.

During the development of the new material, ongoing consultation was undertaken to review additionally identified design parameters. Development resulted in the yield of three different trial products that each had varying compositions of ingredients with which Interchem felt were suitable for product standard trial phase.

To ensure product standard requirements were met, a laboratory-based testing program was undertaken to evaluate the suitability in relation to achieving expansion ratio and half-life properties of the foamed bitumen in accordance with industry specifications.

This was evaluated against a control sample testing (no foaming agent added) and testing utilising the existing industry standard foaming agent.

The testing was conducted in accordance with industry standard NATA accredited methods to ensure consistency and confidence in the resultant outputs.

The laboratory results showed one of the three new products performed exceptionally well by producing an expansion ratio of 14 times the original volume and half-life of 60 seconds.

These results were generated with the bitumen at 180^{o}C and a foaming water content of approximately 2.6%, which are typical conditions employed for foamed bitumen stabilisation. On the basis of these initial results, SPA was confident to progress to the next stage of testing within the field.

The field trials were planned for multiple projects that would ensure we were able to subject the trial foaming agent to a variety of variables to maximise the opportunity to demonstrate performance.

The trial product was used on projects in New South Wales and Queensland which provided the following circumstances:

- Multiple ambient and pavement temperatures;
- Differing governing specifications;
- Multiple host material (C170) suppliers; and
- Sufficient quantity of works to enable use of the existing industry standard foaming agent as a comparison.

The trial foaming agent proved to be successful in both trials in relation to product standard and even exceeded existing industry standard results at stages which was an added benefit.

SPA has led the development of a new foaming agent which has proven to be a superior substitution of the current product as it produces excellent performance results while involving fewer hazards within the workplace. By utilising this alternate product, there is great potential to improve

workplace health and safety throughout the foamed bitumen industry.

The new foaming agent presents fewer risks within the workplace as a result of the following improved characteristics in comparison to the existing industry standard:

- Not classified as a dangerous good and hence does not carry the same risks in transportation, handling and storage;
- Does not cause respiratory distress; and
- Has a higher flashpoint reducing the risk of ignition.

The outcome of this improvement is the significant reduction in subsequent hazards commonly associated with a foaming agent and a reduced level of risk for workers, subcontractors, clients and the public associated with these activities, while maintaining and improving product quality standards.

The substitution of this material within the workplace at SPA has been seen as a proactive effort to improve health and safety within the workplace by staff and has assisted in the ongoing drive for continuous improvement.

This initiative was the winner for Category One: Work Health and Safety in the AustStab 2014 Awards of Excellence.

MELBOURNE AIRPORT SERIOUS ABOUT USING SUSTAINABLE SOLUTIONS

The Melbourne Airport Delta Infill Project consists mainly of major bulk earthworks, 70 tonne pavement installation and installation of associated infrastructures.

The project was located between four of the busiest taxiways at Melbourne Airport.

With a history at the airport and the depth of knowledge and experience within the organisation, Negri Contractors (Negri) was awarded the Delta Infill project.

In the last five decades, Negri has maintained a record of professional ability, reliable performance and a depth of experience in the design, construction and maintenance of major civil engineering projects, predominantly on Melbourne's main roads, freeways and airport.

During the tender phase, its experience in pavement construction was demonstrated with the proposal submitting a conforming tender along with another non-conforming tender that included an option for stabilisation of the pavement.

The non-conforming alternative offered a more sustainable approach to building the subgrade layer which involved reusing the existing material onsite combined with binders to strengthen the material and turn it into an acceptable pavement base.

Negri contractors identified the opportunity to provide alternative treatment that would meet performance specification while offering additional benefits. By substituting a cement-treated crushed rock layer with in-situ lime and cement subgrade stabilisation of host materials Negri Contractors could;

- Reduce task duration by two weeks;
- Reduce cartage across taxiway from 250 truck movements to six;
- Eliminate need to dispose of potentially contaminated materials;
- Eliminate provisional item to treat or dispose of unsuitable subgrade materials; and
- Enable works to be undertaken at night when airport activity was at a minimum and minimize disruption.

Using this material reduced the need for heavy construction equipment to move the material off-site to land fill and return with quarry products. It minimised vehicle movements across runways, reduced overall emissions, and decreased safety risks through less traffic on airport runways and the resulting potential of interaction with flight traffic.

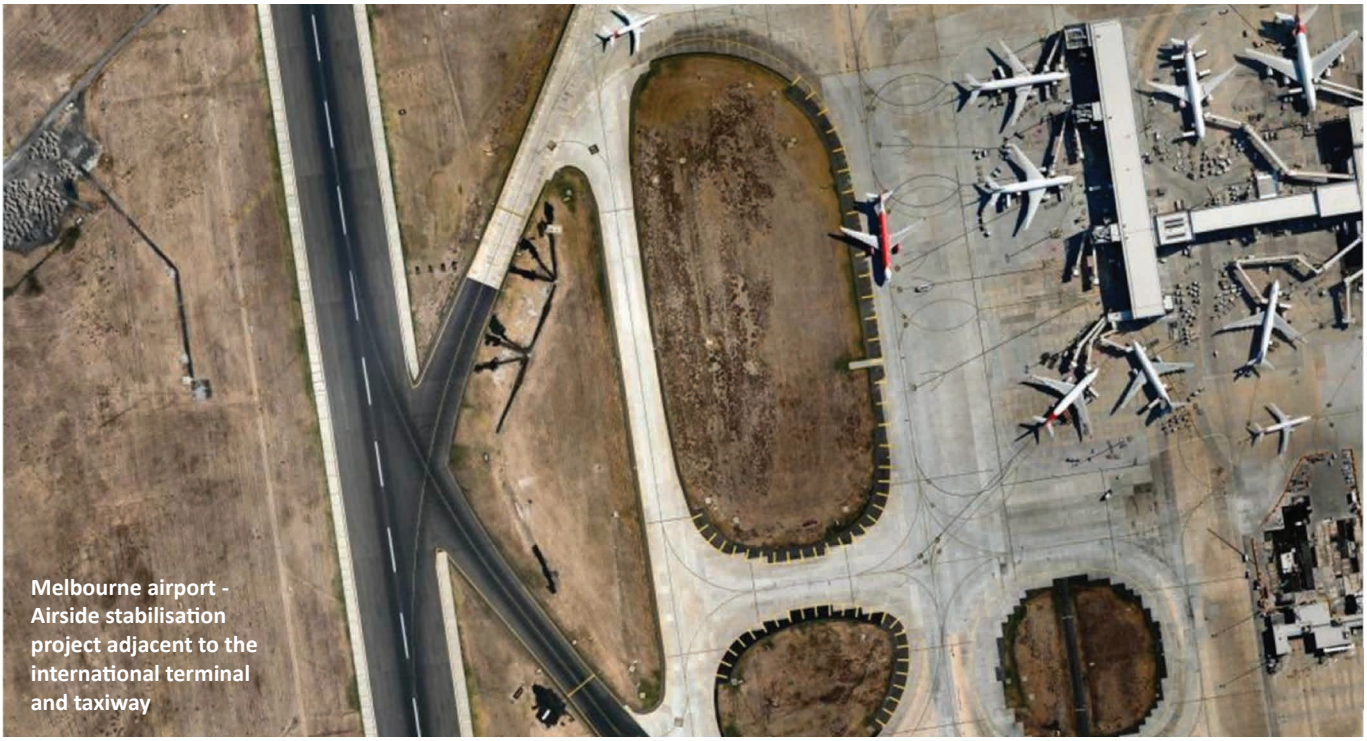
Negri recognises and actively encourages seeking more efficient methods of construction and achieving greater results with readily available recourses and materials as part of the company's day-to-day commitment to environmental sustainability.

Delta Infill project located airside at Melbourne Airport involved construction of a pavement area adjacent to the international terminal and taxiway. Safety of airport operations was a priority at all times with movement to and from the works area strictly limited and controlled.

Original design would have required in excess of 1,500m3 of material to be removed and replaced, 250 truck movements across the busiest taxiway at the airport, entry security checks for all trucks and drivers, maintenance clean vehicles to minimise debris on the taxiway, and greater overall costs to the environment, the airport and the community.

The area stabilised eliminated the removal of fill, utilised stabilisation, achieved greater than expected design characteristics, reduced heavy vehicle traffic and disruption across airport runways, provided value for the client, and in accordance with Melbourne Airport's Environmental Policy; encouraged the practice of re-use and recycle of materials.

Negri was the award winner for the category for Innovation or Excellence in Sustainability in pavement stabilisation in the 2014 Awards of Excellence.



Melbourne airport - Airside stabilisation project adjacent to the international terminal and taxiway

MOUNT KEIRA ROAD ROCKFALL HAZARD REDUCTION AND EMBANKMENT REMEDIATION

This project highlights the advantages of approaching a major engineering challenge with a strategy of enhancement, rather than replacement on a unique Wollongong City Council (WCC) project.

In all aspects of the project a reuse strategy was employed and it made sense to apply, where possible, the same methodology to the road pavement in the final stage of the project.

There were huge savings in the final cost per square metre of pavement, generation of waste, truck movements, time taken and intangibles, such as noise and dust generation.

The location of works includes some 500 metres of rockfall hazard reduction works, road embankment improvement, kerb and guardrail reconstruction, and around 2,100 square metres of road pavement reconstruction.

In this location, the road meanders on an embankment close to the bottom of a 60-metre sandstone cliff with overhanging boulders. The road embankment was constructed as an early haul route using cut-and-push methods such that the inside lane is constructed on sandstone bedrock and residual soils; yet the outside lane is built on various ripped boulder fills which settled over time as the fill materials weathered.

The worst section requiring immediate reconstruction was 180 metres, which in combination with the elevated rockfall risk, eventually forced the road to be closed. This worst section was from CH260 to CH440 on the attached drawing, however, more was eventually treated.

The settlement of the outside lane reached a point where the road camber was 14 degrees, heavily tension cracked and severely undulating. Radial tension crack sets had developed over 50 millimetres wide in places with 50 millimetre steps. Deeplift asphalt repairs over time were found to be over 650 millimetres thick in recovered drill cores and, as a result, the guardrail on the embankment lip had progressively subsided to be much lower than the road crown.

The road was also narrow at 5.5 metres in places with no shoulder, forcing vehicles to use the centre of the road to smooth the curves and avoid rockfall debris at times. Coupled with lack of access and sight distance for frequent cyclists and walkers, and the use by professional louge riders, this amounted to an unacceptable and elevating public risk.

The aim of the project was to reduce the rockfall risk from above and risk of instability of the embankment below for all road users and to provide, as far as practically and economically possible, a fully serviceable modern road in this difficult mountain environment.

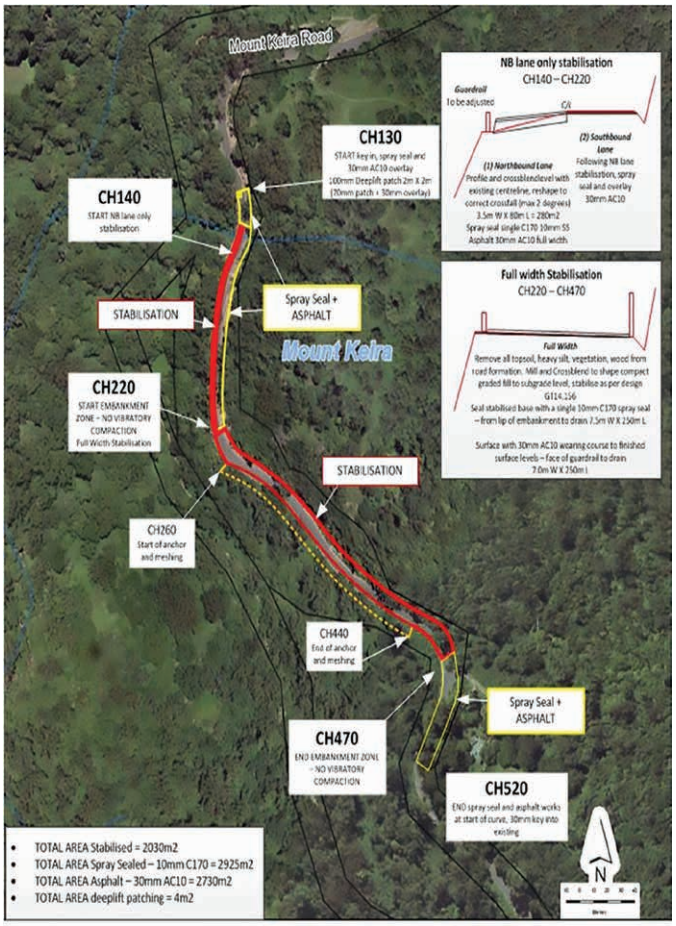
Rockworks and Embankment Works

Works were undertaken by Specialised Geo between December 2013 and June 2014.

Pavement Stabilisation

Due to the camber of the road it was initially reasoned that milling and levelling of the existing pavement would provide a good sub-base for an imported DGB20 pavement and estimates were prepared on this basis. The initial estimate for 150 millimetres DGB20 pavement over milled and recompacted sub-base was obtained.

Later in the design phase, due to the increasing height of the concrete embankment edge, WCC looked to reducing the amount of additional load on the embankment by fully recycling the existing pavement.



In May 2014, WCC Geotechnical Services undertook a stabilisation-specific investigation, recovered two samples (one representative sample and one worst case scenario). WCC then conducted initial dose-rate calculations based on lime-slag binder which has proven adaptability over many years in the local soil types.

The initial stabilisation design is based on borehole composition which projects an appropriate lime-slag binder ratio (for Wollongong soils). The percentage binder addition was also given, and both were checked by lab accelerated UCS tests. WCC believe this approach is new and innovative and should be adaptable elsewhere once fully verified.

Stabilisation was undertaken over only three days by Downer EDI which cleared topsoil and debris from the road edge, profiled and relevelled by grader and finally added binder, water and milled and compacted with a centrally mounted mixer (Day 3).

Due to the sensitive nature of the fresh concrete edge, the compaction was specified as static only. Earthworks calculations predicted more than 28 cubic metres or about 60 tonnes of excess were to be removed. Seventy- eight-tonnes of waste was removed from site and the shape was able to accommodate any deficit with the result that no pavement material was removed from site. The final cost of the stabilisation, seal and asphalt is expected to come in about a-third of the initial estimate and a saving of about $200,000.

The Mount Keira Project was awarded the prize for Excellence in Recycling in Stabilised Pavements in Local Government.