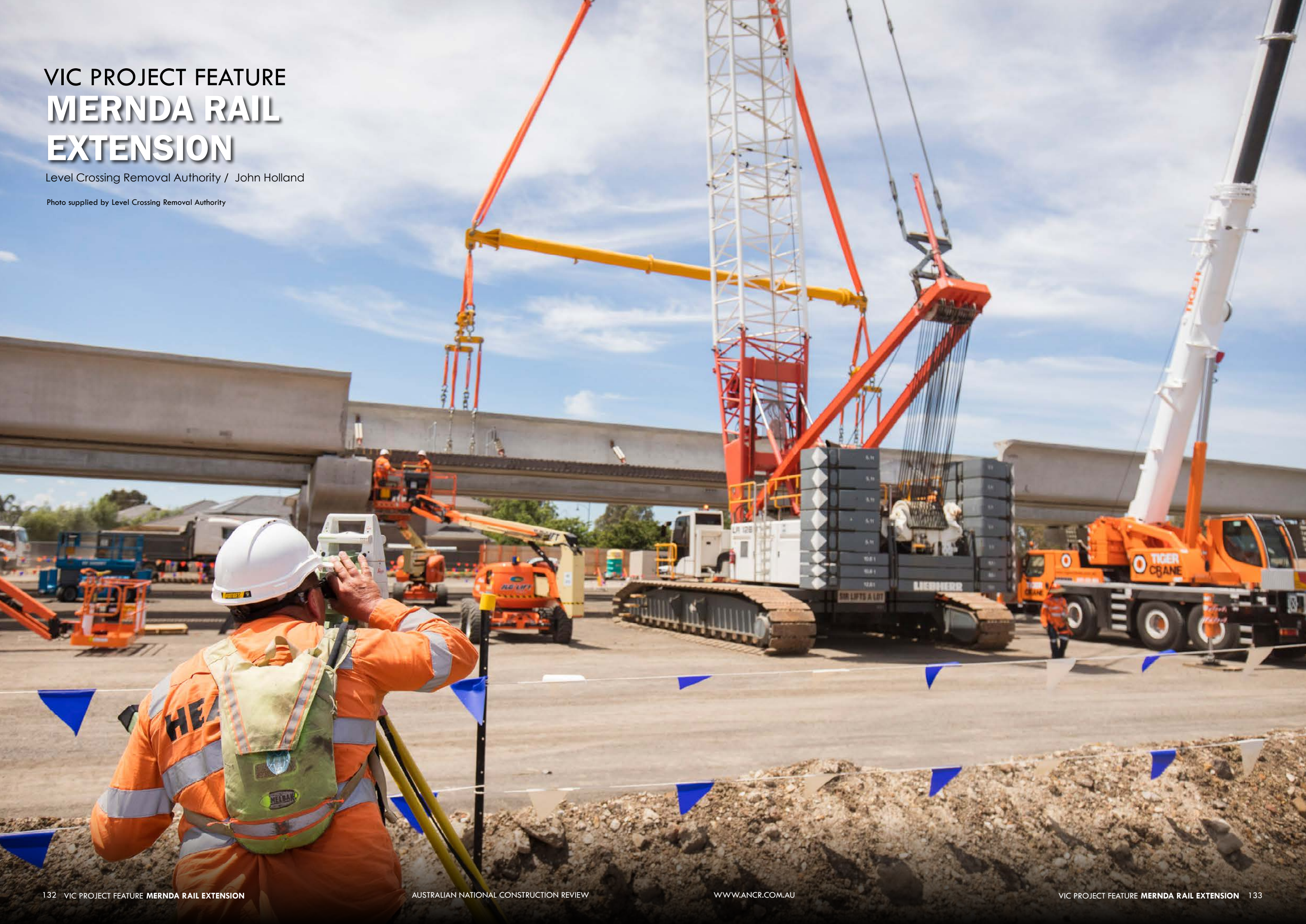


VIC PROJECT FEATURE MERNDA RAIL EXTENSION

Level Crossing Removal Authority / John Holland

Photo supplied by Level Crossing Removal Authority



MERENDA ON TRACK

CLIENT : Level Crossing Removal Authority
MAIN CONSTRUCTION COMPANY : John Holland Group
ARCHITECTS : Grimshaw Architects
CONSTRUCTION VALUE : \$600 million

The \$600M Mernda Rail Extension includes 8km of new rail line, three new stations (Mernda, Hawkstowe and Middle Gorge), car parking for 2,000 cars and three new community spaces at Hawkstowe, The Parkway, and Mernda which also includes a skate park.

This project is part of the Victorian Government's initiative to deliver safer conditions for drivers and pedestrians, and also in order to improve travel around Melbourne. The Level Crossing Removal Authority has extended the rail line from South Morang to Mernda. The large scale development has revitalised local communities and has stimulated economic growth by creating thousands of jobs.

The Level Crossing Removal Authority, along with John Holland Group, started construction of 8km of new rail line and three new stations (Mernda, Hawkstowe and Middle Gorge), to cater for up to 8,000 commuters a day. Around 2,000 car spaces have been built as well as secure bicycle storage facilities. There are also new walking and cycling paths that link the new stations. New community spaces at Mernda and Hawkstowe have playgrounds

featuring exercise and sporting equipment. Mernda station also features a skate park. "We've built some amazing infrastructure for communities in Melbourne's north. The Mernda Rail project connects people to schools, shopping centres and Melbourne's CBD," said acting Project Director, Carmine Ciavarella. Seats and play equipment used rocks and logs reclaimed from the project and as part of the project's commitment to sustainability.

For every tree removed, two trees have been planted, translating to 2,500 new trees. Yarra View Nursery, a social enterprise providing employment for people with disabilities, provided 110,000 native trees, shrubs and grasses that were planted around the new stations

The vast infrastructure project also included the construction of a facility to store, metro trains. The stabling facility accommodates

eight trains, allowing more services to run on both the Mernda and Hurstbridge lines during peak service. With more than two million hours worked, the overall project created 1,200 construction jobs and 1,800 jobs in associated businesses.

In an Australian first, 25-30m long segments of concrete, known as U-troughs, were used to construct elevated rail. The trains travel in a U-shaped viaduct, rather than on a standard rail bridge, known in the industry as a Super-T. The U-trough has been used for many major elevated rail projects overseas, including in Delhi, Dubai and Shanghai.

"We were really pleased to incorporate the U-trough, an innovative construction methodology, on the Mernda Rail Extension. The U-trough design is a first for rail in Victoria and is now being used on other rail projects around Melbourne," said Carmine.

More than 43,000m² of rock and soil was excavated and crushed onsite to be used for haul roads underneath the new tracks, as well as for the gabion walls and seating. The reuse of materials meant fewer truck movements, which was a significant factor in reducing the volume of traffic around the site.

"Good weather and smart design decisions, such as building elevated rail structures to avoid digging out hard rock, all contributed to the project's success. A fairly dry winter meant we could accelerate construction efforts when the finish line was in sight," added Carmine.

The Level Crossing Removal Authority was established by the Victorian Government in 2015 to oversee rail infrastructure projects throughout the state. They are in the process of removing 50 of Melbourne's level rail crossings in addition to upgrading or constructing more than 20 train stations. Over the past three years, The Level Crossing Removal Authority has removed 29 level crossings and built 18 train stations. As part of these projects vast amounts of open space has been created on the Caulfield to Dandenong line, one of the largest releases of urban parkland Melbourne has ever seen.

For more information contact Level Crossing Removal Authority, 14/121 Exhibition Street, Melbourne VIC 3004, phone 1800 105 105, email contact@levelcrossings.vic.gov.au, website www.levelcrossings.vic.gov.au



Below Haulaway were responsible for all of the industrial waste management onsite at the Mernda Rail Extension.

RECYCLING FOR THE FUTURE

Haulaway is a proudly Australian owned and operated company that has been providing waste management services across Melbourne since 1983. At the Mernda Rail Extension, Haulaway provided waste collection and management services throughout the site from South Morang to Mernda.

“We started working at the Mernda Rail Extension in early March 2017, with 30 bulk bins, 10 front lift bins and 35 workers onsite every day. They were responsible for servicing the offices, site huts, compounds and construction zones,” said Sales Manager, Jake Hilbert.

As with most construction sites, onsite at Mernda there was an array of different waste streams and Haulaway set out to reduce the amount of waste sent to landfill. “We provided different bins for recyclables and general waste at the offices and huts. The majority of the waste collected were found at the construction zones where all the bulk bins got filled with mixed waste. We took these bins to Darebin transfer station for separation and diversion from landfill,” explained Jake.

Darebin transfer station is run by the social procurement organisation, Outlook. “We chose to work with Outlook because they’re an Australian organisation employing the socially disadvantaged. They also offer very high recycle rates as well as diversion rates which were in line with the project’s requirements,” said Jake. “At Haulaway we focus on customer service and responsible waste management.”

“By taking the waste to Outlook’s site not only did we contribute to recycling but we supported the organisation,” continued Jake. “Outlook encourages, trains and supports people who haven’t necessarily had the chances we’ve had. Haulaway has a great relationship with Outlook and we are continuing with several joint ventures now and into the future. It’s a great outcome for them as well as for the whole community.”

Onsite, Haulaway worked with John Holland Group to improve recycling rates by providing separate bins for timber and concrete waste. “We also identified the high volumes of PVC piping going into general waste. Because of this, we developed a specific bin

design for PVC waste and trialled it onsite,” explained Jake.

“The challenge of the job involved the spread of waste collection points all over the site, and keeping up to date with the changing access roads as the build progressed,” said Jake.

Haulaway had up to 20 people and 15 trucks working on the Mernda Rail project, finishing the job in early November 2018.

Haulaway evolved from Industrial Waste Collection Victoria (IWCV), formed in 1963 when Jim and Peter Hilbert purchased their first dempster dumpster vehicle, thereby pioneering the containerised waste collection system in Melbourne.

IWCV then purchased a dodge truck but they had difficulty avoiding overloading the front axils. Jim Hilbert approached Leyland Motors to fit twin steers to the vehicle and nowadays twin steers are commonly used, especially in the waste industry. “These days our trucks have Euro five vehicle standards with emission control systems and reduced fuel usage,” said Jake.

Haulaway supplies the industry with stationary and transportable compactors. They also offer services in system auditing and reporting. Haulaway has been working with John Holland Group since 2005, when they provided waste management services for the Eastlink Motorway and the Sugarloaf Pipeline Project.

“We enjoy a very strong relationship with John Holland Group and have worked with them on various projects including Melbourne Water Works at Cardinia Reservoir as well as the Environmental Improvement for the Eastern and Western Treatment Plants programme. Around the Melbourne metropolitan area Haulaway serviced the Metro Tunnel Early Works package, several of the Level Crossing Removal sites such as the new Metro tunnel project with Cross Yarra Partnership and the Westgate Tunnel Project,” said Jake.

For more information contact Haulaway, 1-7 Souffi Place, Dandenong South VIC 3175, phone 1300 660 838, email info@haulaway.com.au, website www.haulaway.com.au



Below The team from Frazer-Nash Consultancy who developed the framework used by stakeholders and project designers in order to access their work seamlessly.

Below WT Partnership provided Public Transport Victoria with an Independent Estimator Review on the Mernda Rail Extension.



Frazer-Nash Consultancy is a leading international systems engineering and technology consultancy, with 60 staff in Australia spread across Adelaide, Melbourne and Canberra. Frazer-Nash helps organisations deliver engineering innovation to make lives safe, secure, sustainable and affordable. They are routinely to be found at the early stages of complex projects and where engineering is novel or complex. In early 2016 Frazer-Nash started working with John Holland Group on the Mernda Rail Extension.

A small team created the systems engineering framework for designers and stakeholders to use in order to assess their work. “It’s important to set out the development process and assess the work from the early stages and throughout the project’s progress so that the impact of decisions can be understood, communicated to stakeholders and planned into the whole project,” said Rail Business Manager, Chris Baker.

“Our systems engineering processes enable designers to ensure their work meets codes and standards. For example, in regards to safety and systems assurance, delivery teams can check that their work satisfies the requirements of the brief. This offers traceable, demonstrable evidence of the effectiveness of the technical solution and project

delivery, as well as increasing client satisfaction. A key challenge is to get the right people working together to make sound decisions for the project. We had a highly successful outcome with John Holland Group,” continued Chris. “We’ve been working with John Holland Group over the last five years on a variety of road and rail projects in Melbourne and around Australia.”

Established in the UK, Frazer-Nash has years of experience working at government level optimising Britain’s vast rail network. The company supports the Australian rail industry, providing systems engineering and systems assurance support to governments, operators and project teams. Frazer-Nash apply a Systems Approach to understand the whole range of financial, operational, organisational, people and other issues that surround a technical need. Solutions are based on a detailed knowledge of a broad range of disciplines such as electrical, mechanical and digital engineering technologies, and their application across different markets including power, mining, oil & gas, industry and defence.

For more information contact Frazer-Nash Consultancy, Level 11, 385 Bourke Street, Melbourne VIC 3000, phone 03 9037 2200, website www.fncaustralia.com.au

With over 70 years experience providing expert cost consultancy advice to public and private sector clients across the globe, WT Partnership (WT) has gained an award-winning reputation for their progressive and community focused approach to financial solutions.

WT is at the forefront of Victoria’s surging infrastructure pipeline, helping to deliver over \$25 billion of rail projects and \$50 billion of infrastructure developments in the last five years alone.

The Mernda Rail Extension is part of the boom that’s redefining the way Victorian’s travel, connecting the fast growing northern suburbs to the rest of Melbourne. The company provided an independent estimator review for the proposed design of the project on behalf of Public Transport Victoria. The project was led by Associates Lance Weatherell and Latham Conley, both experts with significant experience on large scale rail and infrastructure projects. They delivered specialist cost controls for the landmark development.

“Major rail projects like the Mernda Rail Extension come with major challenges including tight time frames and managing the various options. WT’s experience on comparable projects and

access to extensive benchmarking of cost and programme meant we were able to deliver impartial and objective cost advice,” said Lance.

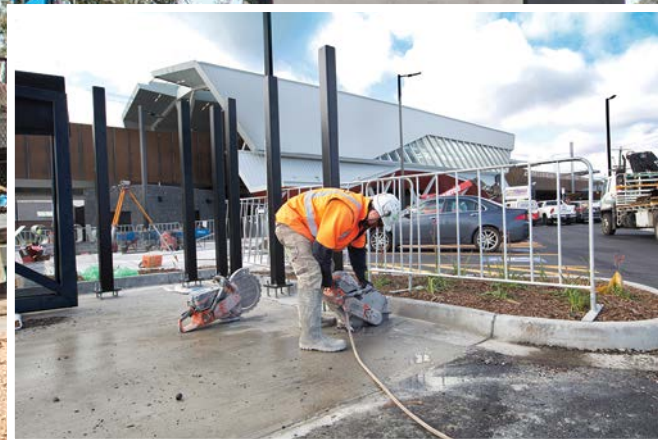
“We’re proud to have been part of the team that successfully delivered such a defining project for Melbourne’s north and we look forward to our continued work on some of the other major infrastructure projects shaping our state,” added Lance.

Significant projects in WT’s vast portfolio of major Victorian infrastructure developments include the Melbourne Metro Tunnel and Stations PPP, the Level Crossing Removal project, the Regional Rail Revival Programme, the West Gate Tunnel and the North-East Link. They are also providing cost management services on the Port of Melbourne’s Capital Works Programme and Port Capacity Programme and have been onsite at Melbourne Airport providing cost advice for over 12 years.

For more information contact WT Partnership, Level 4, Q2, 4 Riverside Quay, Southbank VIC 3006, phone 03 9867 3677, email melbourne@wtpartnership.com.au, website www.wtpartnership.com.au

Below Auscut Concrete Drilling and Sawing supplied specialist concrete cutting services for the Mernda Rail Extension.

Below Rangedale Drainage Services facilitated asphaltting, backfilling and relocation of underground assets for the project.



Auscut Concrete Drilling and Sawing specialises in concrete cutting services including drilling and grinding, coring for testing and GPR scanning on existing concrete structures. At the Mernda Rail Extension, Auscut Concrete Drilling and Sawing worked on the stations platform including South Morang, Hawkestone and Mernda as well as bridges and roadworks.

Auscut Concrete Drilling and Sawing, established in 1982, is now one of Melbourne's largest concrete cutting companies. The company also works throughout regional Victoria and have also spent three months working for McConnell Dowell in Port Hedland."

Auscut Concrete Drilling and Sawing cater to all types of concrete sawing and drilling including scarifying and pattern cutting as well as brick and paver cutting. They also have a range of specialised tools to provide soff cut early entry sawing, hand sawing, ring sawing and wire sawing as well as hydraulic and electric sawing for fumeless work.

Auscut Concrete Drilling and Sawing has worked on some major infrastructure projects including previous work at Mitcham, Nunawading and Springvale for the Level Crossing Removal Authority. Currently, Auscut Drilling and Sawing are working for Lendlease on the construction of the Tullamarine Freeway.

For more information contact Auscut Concrete Drilling and Sawing, 18 McLennan Drive, Kensington VIC 3031, PO Box 185, North Melbourne VIC 3051, phone 1800 287 288, email info@auscut.com.au, website www.auscut.com.au

In June 2017 Auscut Concrete Drilling and Sawing started with six operators, drilling the concrete platform floors for fixing screens and handrails, as well as sawing for drainage pits. Road sawing was carried out to build drains and to trim the edges of existing asphalt surfaces. GPR scanning was used to locate reinforcement bars and conduits within bridges and U-toughs so fixture anchor points could be drilled without drilling through the reinforcement.

"Auscut worked well on this project," said General Manager, Matthew Weeks. "As the work continued and became more demanding, we achieved the project milestones. We enjoyed working on this project, as we have with all of the John Holland jobs we've done. Their site supervisors are always well organised and all of the workers are very helpful to our staff."

Rangedale Drainage Services specialises in underground asset location and all aspects of civil and drainage work. In February 2017, Rangedale Drainage Services started work at the Mernda Rail Extension with up to 10 workers onsite each day locating electricity and gas lines, as well as carrying out civil works including hydro excavation, saw cutting and reinstatement works.

"We used GPR and mobile CCTV equipment to locate underground utilities," said Business Development Manager, Michael Polwarth. "The position of the services was then marked up on the ground and we carried out relocation, backfilling of trenches and asphaltting."

"At Rangedale Drainage Services, the challenge of our work involves supplying solutions for unique situations," continued Michael. "We have experienced operators and the right equipment for accessing tight work sites or especially long trenches."

Rangedale Drainage Services offers the Smart Lock system, a major advancement in point repair for damaged pipelines. The no-dig solution uses an expanding stainless steel tube to fix a silicate or epoxy impregnated blanket to damaged pipes. The material hardens within 10 minutes, translating to great cost and time saving.

Rangedale Drainage Services, established in 1998, employs over 160 staff to provide construction of industrial drainage and civil works, as well as remote, trenchless inspection of sewer and storm water pipes for repair. They also provide jet cleaning and root cutting, pipe relining, line replacement, impact cutting and high volume vacuum suction services.

Previous Level Crossing Removal Authority projects for Rangedale Drainage Services include asset location at the Kororoit Creek Road for McConnell Dowell and at Buckley Street in Essendon for John Holland. "Rangedale has been working on successful projects with John Holland for the past eight years," said Michael.

Currently Rangedale Drainage Services are working at the Melbourne Metro Tunnel and West Gate. Other projects include capital works projects for Melbourne Water and maintenance contracts for City West Water and South East Water in Victoria.

For more information contact Rangedale Drainage Services Pty Ltd, 25-27 Salta Drive, Altona North VIC 3025, phone 03 8368 8888, email info@rangedale.com.au, website www.rangedale.com.au

Below E & J Septics facilitated waste management services to the portaloos onsite at the Mernda Rail Expansion.

Below AGFAB Engineering assisted in the manoeuvring of heavy machinery onsite and provided steel fixtures throughout the project.



E & J Septics specialise in waste management services, desludging septic tanks for temporary buildings and portaloos at construction sites, events as well as for residences. They supplied sewage pump out and removal services at the Mernda Rail Extension project from the beginning of site works in early 2017.

E & J Septics provided two trucks with the capacity of 12,000L and one 8,000L truck to visit the site three times a week until work was completed in late October 2018. Four operators emptied 12 tanks that serviced the 35 portable toilets and site buildings.

“The challenge of the job involved the size of the site,” said General Manager, Ryan Sockett. “The works were spread out over 6km and the rain made it a very muddy site. We also had to keep track of which roads were available, as the construction work progressed, access routes changed.”

E & J Septics are a family run business and have over 35 years experience desludging septic tanks and both construction and domestic sites across Melbourne, the South Eastern Suburbs, the Mornington Peninsula and Dandenong Ranges. They employ 11 operators and have a fleet of seven pumping trucks including

a smaller truck to service restricted access sites. E & J Septics’ services also include emptying storm water, greywater pits and domestic grease traps.

E & J Septics provide after hours emergencies service for sewer blockages with repeat work for South East Water and Yarra Valley Water. They also service events. An event of mention is the Deni Ute Muster at Denilquin, where they deslugged septic tanks over the week long festival.

E & J Septics have been working for John Holland for more than 10 years including supplying septic pumping services at Spencer Street Station in 2006 and Benteleigh Rail in 2015. Currently, E & J Septics are working at the Caulfield to Dandenong Skyrail for Lendlease.

For more information contact E & J Septics, 2/11 Isa Way, Boronia VIC 3155, phone 03 9729 6844, email accounts@ejseptics.com.au, website www.eandjseptics.com.au

AGFAB Engineering are a general engineering company specialising in mechanical and civil construction. At the Mernda Rail Extension the company manufactured, supplied and installed steel components. They also supplied transport for moving heavy equipment and materials around the site.

In March 2017, AGFAB Engineering started the manufacture of steel fixtures for the platforms of the three stations, with two boilermakers fabricating galvanised walkways, stairways and handrails for use by station staff. Mild steel powder coated brackets for fitting security cameras and lights were also manufactured. Onsite work included a large amount of welding of steel reinforcement cages for concrete pours around the bridge. AGFAB Engineering also provided two drop deck semi-trailers and a crane tilt tray truck to move bobcats, excavators and road barriers around the site.

“The challenge of the job was the tight programme,” said Director, Joseph Frattin. “However, the Mernda Rail Extension was one of many jobs AGFAB Engineering has done with John Holland and they are a well organised company. We have been working with John Holland over the last 15 years and appreciate their professionalism, especially their commitment to work

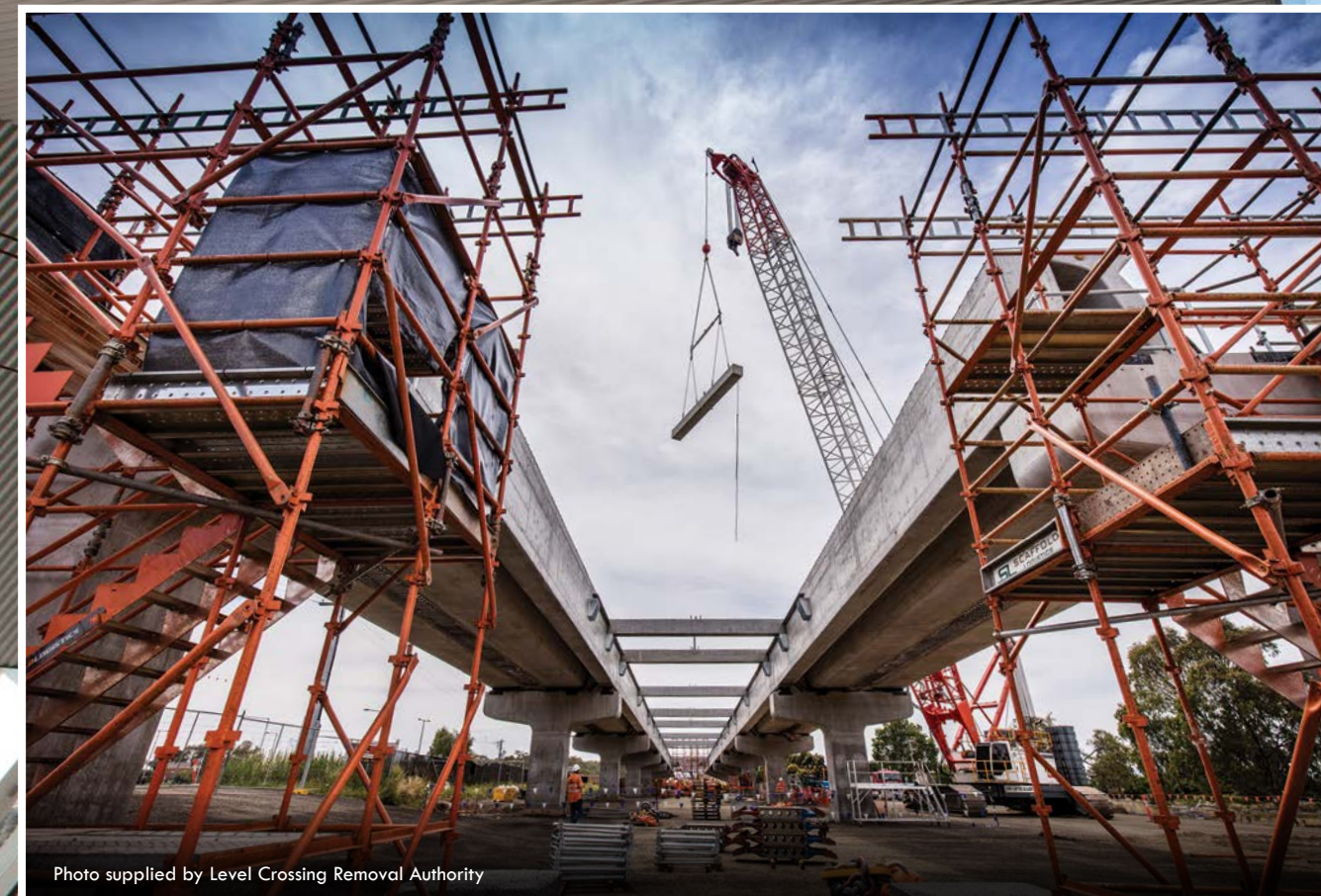
place safety including their training on working at heights and semi-trailer movements,” continued Joseph.

Established in 1991, AGFAB Engineering has a fully equipped workshop of 5,500m². They provide project management services as well as design and drafting for specialist items, including carbon steel and stainless steel pipe. AGFAB Engineering has many years of experience in mechanical services fabrication and installation. They are experts at complex maintenance, overhaul and repair projects where continuous plant operation is vital. The company also work across the construction, petrochemical, agricultural, water and waste water industries.

In March, AGFAB Engineering started work on Melbourne’s Metro Tunnel supplying welders/trade assistance working on 9-storey deep shoring. In June, they commenced work at the Westgate Tunnel transporting piling equipment.

For more information contact AGFAB Engineering Pty Ltd, 14 Wallace Avenue, Point Cook VIC 3030, phone 03 9369 5577, email office@agfab.com.au, website www.agfab.com.au

Below Scaffold Logistics installed the fitting edge protection around the U-troughs onsite at the Mernda Rail Extension.



Scaffold Logistics specialise in design engineering, rigging and scaffolding solutions. At the Mernda Rail extension, the company designed the steel components for the station buildings, supplied rigging services for the construction and provided scaffolding services across the site.

Scaffold Logistics started design work for the project in late 2016 which was soon followed by the manufacturing of steel framing elements, after which they began developing sweeping platform roofing and signage. Onsite work started early 2017, with riggers fixing the steel and scaffolders fitting edge protection around the U-troughs, piers and crossheads for the elevated rail line, as well as fitting stretcher stairs, handrails and fall protection equipment.

“The challenge is always delivering a well engineered design. Onsite we focused on providing scaffolding solutions for the changing needs of the build. The Gabion wall at Middle Gorge station required a quick response scaffolding design that allowed safe access for workers as they constructed the 6m high feature wall,” said Sales Manager, Ian Douglas.

Scaffold Logistics has a strong culture of cooperation with all trades and stakeholders. They endeavour to work closely with

clients at the planning phase to improve site logistics and maximise efficiency. Safety is a priority for Scaffold Logistics with regular staff training and reviews of systems procedures to reduce incidents of workplace injury.

Scaffold Logistics work across the industrial and commercial sectors as well as in the hazardous environments of oil and gas resources. Large scale infrastructure projects include previous work for John Holland Group in strengthening the Westgate Bridge where Scaffold Logistics provided the design engineering as well as over 3,000 tonnes of scaffold equipment.

Scaffold Logistics also has extensive experience installing scaffolding around the delicate fabric of heritage buildings for restoration projects including the cleaning of the sandstone façade of the State Library of Victoria and creating a temporary dry environment for restoration works of Swanston Square.

For more information contact Scaffold Logistics, 2 Summit Road, Noble Park North VIC 3174, phone 1300 857 293, email info@scaffoldlogistics.com.au, website www.scaffoldlogistics.com.au