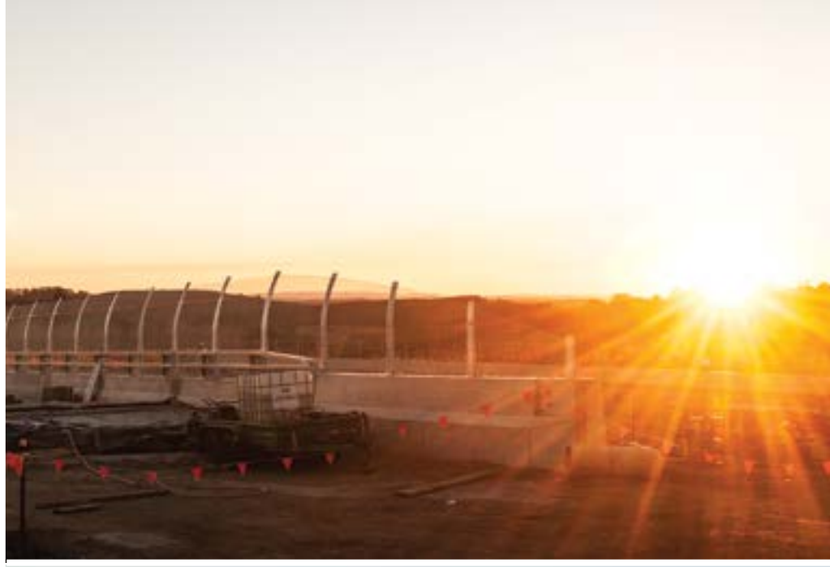
MAIN CONSTRUCTION COMPANY: Baulderstone
CONSTRUCTION VALUE: $531 million
COMPLETION DATE: Mid 2014



THE LONG AND WINDING ROAD

Featuring four lanes and approximately 17km in length, the Tintenbar to Ewingsdale Pacific Hwy upgrade will improve road safety, allow uninterrupted traffic flow & easy access on and off the highway for local traffic.

Roads and Maritime Services has awarded a contract to Lend Lease to design and construct the Tintenbar to Ewingsdale Pacific Highway upgrade. This project is jointly funded by the NSW and Australian governments.

The upgrade will provide about 17km of four lane, divided road, starting at the northern end of the Ballina bypass at Ross Lane, extending to the Ewingsdale interchange. It is due for completion in the first half of 2015.

The Tintenbar to Ewingsdale Pacific Highway upgrade is designed to improve safety, traffic efficiency and increase capacity along the Pacific Highway, and was identified as a critical infrastructure project by the NSW Government.

BUILDING THE TUNNELS

Excavation of the tunnels has been divided into three sections – heading, bench and invert. A drill and controlled blast technique is being used to excavate the hard basalt rock. During excavation, and in order to provide a safe working environment for tunnel workers, the tunnel is supported with steel rock bolts and shotcrete (sprayed concrete with reinforced fibres).

The tunnels will mostly be excavated through high strength basalt rock which originated as lava flow from the Tweed shield volcano centred on Mount Warning about 20 million years ago.

The breakthrough of the northbound tunnel on January 24 marked an important milestone for the project. Breakthrough on the southbound tunnel is expected in March.

The tunnel excavations have so far encountered the full spectrum of basalt rock, from very high strength basalt to weathered basalt and residual soil. Through the design process, the support types have altered according to the strength of the rock encountered, from 100mm of shotcrete and friction grip rock bolts in hard rock, to 300mm shotcrete, lattice girders, grouted bolts, and spiling bars for overhead support in more weathered rock and residual soil.

With excavation progressing well, preparations are being made to start the tunnel permanent lining phase. To line the tunnel, two steel travelling tunnel forms have been procured from Austria.

The travelling tunnel forms are capable of pouring a 10m long block of concrete at a time. The permanent lining will be smooth reinforced cast in-situ concrete, capable of withstanding a serious fire, ground and water pressure and be a minimum of 500mm thick with a design life of 100 years. A sheet waterproofing membrane will be installed for the full circumference of the tunnels to ensure they are water tight.

TUNNEL FACTS AND FIGURES

The excavated tunnels are:

- 434m long
- 19m wide
- 46m below St Helena Road
- 12m high
- Total face area of about 200m^2
- Provide enough space for three lanes of traffic in each direction
- Have a minimal height clearance of 5.3m

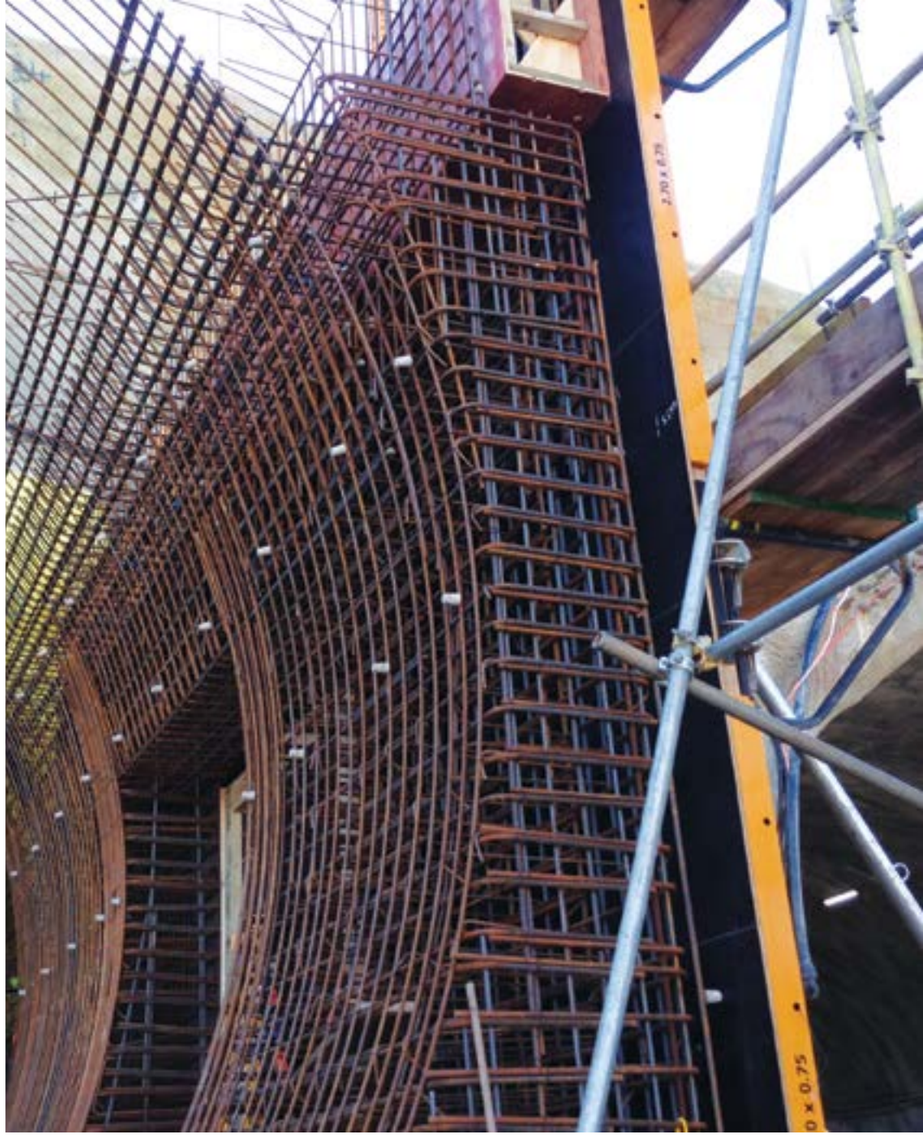
The tunnels will eliminate the need for permanent cuts and visual impacts on St. Helena Hill. It will require 30,000m^3 of permanent concrete lining, over 40,000m^2 of waterproofing membrane and contain more than 3000 steel rock bolts. It will also be provided with 32 reversible jet fans for ventilation and fire safety and will store 2.6 million litres in tanks to supply the tunnel fire deluge system

The tunnels were chosen to minimise the footprint on the St Helena ridgeline and to maintain the scenic views of the area. To reduce impacts, where possible, infrastructure such as substations and deluge tanks has been located underground.

Safety features of the twin tunnels include:

- Three cross passages between the two tunnels for emergency exit, suitable for use by disabled people.
- A fire suppression deluge system comprised of 12 kilometre of pipework, fed by buried water storage tanks at the tunnel control centre
- A system of ventilation fans and monitors placed at intervals along the tunnels that will ensure air quality during tunnel operation and also vent smoke in the event of a crash or fire in the tunnel.
- Emergency warning and intercommunication system including an automatic incident detection system, public address system, radio re-broadcast system, emergency phones, fire hydrants, break glass alarms and emergency exits
- Breakdown bays outside of the tunnel portals
- CCTV cameras along the approach to and through the tunnel to allow monitoring from the Roads and Maritime Services control centres
- Tunnel lighting system
- Detailed signposting system including advance warning electronic message signs and variable speed limits.

For more information contact Roads and Maritime Services, NSW at www.rms.nsw.gov.au



REINFORCING THE WAY

Concrete Reinforcement Services (CRS) are a civil construction company that specialise in bridges, roads, incrementally launched bridges, precast yard and culverts.

Working meticulously on the recent Tintenbar to Ewingsdale project, CRS was responsible for all the reinforcement requirements for the bridges and tunnels.

In all, the company worked on 13 bridges which are located over a 25-kilometre stretch, as well as the twin north-bound and south-bound tunnels at St Helena Hill. Each tunnel is 450 metres in length and are the biggest in situ tunnels ever built in Australia. The works also included the positioning of around 40 piers, which were prefabricated on the ground and then moved into place by onsite cranes.

CRS has been working on the Tintenbar to Ewingsdale project since 2012, which has seen the team produce more than 8000 tonnes of reinforcement material.

Concrete Reinforcement Services' Director Nailer O'Neill said the company currently has 60 of its staff working on the tunnels. CRS is due to complete works at the site by Christmas.

"The project is 80 per cent finished and we are currently working 24 hours a day, completing two 12-hour shifts in both the tunnels," he said.

As expected with a project of this calibre, the Tintenbar to Ewingsdale construction has provided CRS with a few challenges, including undertaking works across the project's 25-kilometre distance.

"The way we are building the tunnels is also new for CRS. We usually use a precast system, however for this project we are actually building the reinforcement itself, which is a first for us," Nailer said. "Another challenge we are facing at the moment is that we are working 24 hours in the tunnels, so we have to make sure there are enough men and supervisors able to work the required shifts."

The company, which employs 80 staff, is willing to work on projects anywhere across Australia. This is reflected by the major civil construction projects CRS is currently working on or has just completed. This includes the Frederickton to Eungai upgrade in New South Wales for Thiess, where CRS is working on 12 bridges for the 26.5-kilometre civil construction project, which includes a four-lane divided road and new interchange. CRS has also just completed works on the $1.7 billion Hunter Expressway for Thiess, a 40-kilometre freeway link between Newcastle and the Upper Hunter Valley.

Last year, the company completed works on the Urban Superway Project in Adelaide, a 4.8-kilometre highway connecting the Port River Expressway to Regency Road. The $842m project includes a 2.8-kilometre elevated roadway and was a joint venture between John Holland, Macmahon Contractors and Leed Engineering and Construction.

CRS has also just finished working on the 4.6-kilometre tunnel for Brisbane's Legacy Way project, which is being constructed by Transcity (a joint venture of BMD Constructions, Acciona Infrastructures and Ghella) for Brisbane City Council.

Given CRS's history of working on significant civil construction projects, the Tintenbar to Ewingsdale upgrade is certain to be another showcase development for the company, adding to its long list of successful projects.

For more information contact Concrete Reinforcement Services Pty Ltd, phone Philip Teeling (Supervisor) on 0424 500 530, Clive O'Neill (Supervisor) on 0410 715 206, Nailer O'Neill (Director) on 0410 699 006, email info@crsreo.com.au, website www.crsreo.com.au

ONE STANDARD - THE BEST

CPTS Pty Ltd has secured a proud heritage and iconic reputation within the Australian geotechnical engineering industry.

CPTS has been involved in over 20 highway upgrade projects in Northern NSW and Queensland including the Tintenbar to Ewingsdale, Glenugie to Devils Pulpit, Gateway Motorway projects and NARP at the Brisbane Airport.

The test results achieved by CPTS are consistently of the highest quality and are delivered with unmatched efficiency and cost effectiveness.
CPTS can access and test on:

- Reclamation sites
- Tidal mud flats
- Tailings dams
- Highway Upgrades
- Dam walls
- Pre and post sand densification
- Slip failures
- Swamps and
- Construction sites, etc.

The variety of CPT rigs available include: Truck mounted, heavy tracked, low ground pressure tracked, mini tracked, fully amphibious, portable, and Australia's only CPT rig capable of traversing liquid tailings, as well as a hoverbarge an airboat and a fleet of Argos.

CPTS is committed to ensuring satisfaction for you and your client. They achieve this by delivering a top-quality service and by keeping you informed throughout the entire engagement and delivery process.

TESTAMONIAL

"Due to CPTS's track record and competitive rates, Coffey Geotechnics selected CPTS as the specialist subcontractor for the Glenugie to Devils Pulpit section of the Pacific Highway upgrade. CPTS was responsible for CPTu, Vane Shear and Dilatometer Testing which formed important elements of investigating the soft soils. This project is about 71 km long, has over 10 km of soft soil and is the longest section of Pacific Highway Upgrade ever to be awarded by RMS".

"We are extremely pleased with the high data quality and production rate that CPTS has been able to achieve. We have and will continue to utilise their services on current and future projects".

Dean Harris
Associate Engineering Geologist
Glenugie to Devils Pulpit Project Manager

Yvo is available to conduct site assessments and provide advice on the most suitable of our vehicles to access even your most challenging sites.

CPTS
cone penetration testing services

For more information contact CPTS by phone on 0407 375 977, email yvo@cpts.com.au, or visit our website www.cpts.com.au

STRONG AND CIVIL

AWD Civil was recently involved in the Tintenbar to Ewingsdale upgrade, which forms part of the Pacific Highway Upgrade Program.

The team at AWD Civil were responsible for the construction of sub surface drainage infrastructure throughout the Northern, Central and Southern zones of the development. The scope of work also involved the installation of headwalls and precast concrete pits with pipe sizes ranging from 375mm through to 1650mm.

As with all projects, AWD Civil provided a team of highly qualified staff to ensure the job progressed accordingly. For this particular project there were deep excavations involved up to 5m deep.

AWD Civil were aware of the environmental impacts where habitats or areas of vegetation were to remain protected. This made traversing around in an excavator difficult but the team ensured there was no damage to the protected areas.

Throughout the works, AWD Civil worked closely with multiple contractors' onsite to provide a safe, open and progressive work environment.

AWD Civil have used recycled crush material generated from other onsite areas and crushed onsite by the principle contractor.

The company offers a diverse range of infrastructure services that are innovative, cost effective and high quality civil solutions.

AWD Civils' comprehensive services means they are able to offer solutions within both the commercial and domestic fields with clients extending from service authorities, large tier one civil companies and mining, through to small domestic projects and subdivisions.

For more information contact AWD Civil Pty Ltd, Unit 30, 20-22 Ellerslie Road, Meadowbrook QLD 4131, phone 07 3200 5766, fax 07 3200 2490, email info@awdcivil.com.au, website awdcivil.com.au

WINNING AWARDS

Ballina Concrete Pumping was selected to carry out concrete pumping services for the Tintenbar to Ewingsdale project in New South Wales. The upgrade covers approximately 17 kilometres and is set to improve road safety and allow for easy access on and off the highway for local Traffic.

Ballina Concrete Pumping have a reputation for paying close attention to time schedules and WH&S. They also feature well-maintained equipment and ensure all operators are correctly licensed, dedicated and experienced.

As a contractor of choice for all civil, commercial and domestic work, Ballina Concrete Pumping has won numerous awards, which support their renowned reputation, and keeps them ahead of their game. Some of the awards are listed below:

- Winners 2012 Ballina Shire Business Excellence Awards
- Workplace Health and Safety
- Winners 2011 Ballina Shire Business Excellence Awards Business of the Year
- Winners 2010 Ballina Shire Business Excellence Awards Corporate Citizen of the Year
- Winners 2008, 2009 & 2010 Ballina Shire Business Excellence Awards Trade Services

Ballina Concrete Pumping is a family owned business and has been operating for more than 10 years. The business can cater to projects of all types and sizes. The experienced team is always ready to provide a service which is stress free, and an end product which meets and exceeds expectations every time.

The team at Ballina Concrete Pumping is also working on the Pimlico to Teven project, the Devil's Pulpit and various other commercial works, along with their regular domestic work.

For more information contact Ballina Concrete Pumping. PO Box 7047, East Ballina 2478, Chris 0413 997 888 for pump bookings, All Admin 02 6686 5075, email admin@ballinaconcretepumping.com.au, website www.ballinaconcretepumping.com.au

SHOOTING TO SUCCESS

Jemna's involvement in the Tintenbar to Ewingsdale (T2E) project started in early 2012 with the pre-construction trials of the equipment as well as the Shotcrete & Fibrecrete mixes to be used in the lining of the St Helena Tunnel's, an integral portion of the T2E project.

Further to this Jemna was invited to carry out trials for the spraying & methodology for the application of Shotcrete & Fibrecrete of all the open drains on the T2E project.

The initial requirement of one shotcrete crew grew to three crews at various stages of the project as the weather took hold & pushed different areas into the critical path category of works. Logistically Jemna was faced with very rough terrain & varying access issues that lead us to having to push up to 120mtrs at times in excessive heat in order to complete some of the larger drains on the job. With the demanding specifications (Colour, reinforcement and 100 year life) on the design & product of the T2E project, Jemna has to date been able to successfully and safely deliver quality outcomes on all of the works carried out to date.

Jemna's is a ground support contractor specialising in the application & management Shotcrete & Fibrecrete. Whilst Shotcrete application is their specialty, Jemna also offers specialty labour hire, pre-mix trial management, budgetary pricing, training, EFNARC certification, hand held rock installation, grouting, meshing & related services.

A new addition to Jemna is the Road Registered Shotcrete robot, the "RoadRunner", a 4 x 4 carrier that boasts a 20 metre boom, 400CFM compressor & concrete pump with chemical injection facilities for faster set times. The rig is capable of spraying Shotcrete/Fibrecrete up to 17m vertical off the ground & similarly on any down slope off the side of tight road ways as well as underground application.

With elimination & engineering high on the priority scale of the hazard hierarchy this system brings optimum safety to an often otherwise high risk potential scenario.

The "Roadrunner" is the only unit available in Australia to date & Jemna is very proud to be able to offer this high standard of SAFE, EFFICIENT & QUALITY system.

For more information contact Jemna Pty Ltd, 611 Gold Creek Road, Brookfield QLD 4069, phone 07 3103 2021, mobile 0477 450 384, email info@jemna.com.au, website www.jemna.com.au

A FINE FILL

Ramtech Pty Ltd began trading in 1981 and purchased Dunloe Park at Pottsville, New South Wales in 2001. An application to operate a sand quarry was lodged in 2002 with final approvals issued in 2009. Dunloe Park is a cattle producing property of 630 hectares of which 56 hectares is approved for sand extraction. Sand resources are estimated at 9,000,000 tonnes.

The team at Dunloe Sands were chosen to supply Bed&Haunch and Washed&Fillsands for the Tintenbar to Ewingsdale project.

The Tintenbar to Ewingsdale upgrade consists of approximately 17 kilometres in length starting at the northern end of the Ballina bypass and extending to the Ewingsdale interchange. The construction was approved in January 2010 when Baulderstone Pty Ltd were awarded the design and build of the project.

Dunloe Sands operates with best practice measures at the forefront of their business procedures at all times. The company operates under both approved mining leases and extractive permit issued by the Department of Planning, Department of Environment and Climate Change and Department of Mineral Resources.

The following high quality products are available to the construction industry:

- Washed Pit Sand
- Bedding Sand
- Brickies Loam
- Block-layers Loam
- Concrete Sand.

Dunloe Sands also offers specialised products to a vast range of industries including garden features, sporting grounds and golf courses.

For more information contact Dunloe Sands, Mooball NSW 2483, phone 0411 795 060, email sales@dunloesands.com.au