

A RESOURCEFUL APPROACH TO DELIVERING PROGRESS

The Princes Highway West Duplication project consists of 23km of roadworks and bridgeworks to replace the existing two lane highway with a dual separated carriageway.

MAIN CONSTRUCTION COMPANY : BMD Constructions
CLIENT : VicRoads
PROJECT END VALUE : \$70 Million
COMPLETION : Mid 2014
DESIGN : Hyder Consulting



In undertaking the Princes Highway West Duplication project from Waurn Ponds to Winchelsea, BMD Constructions is delivering a life-saving road upgrade, and doing so in a manner that is protecting the environment, delivering immediate economic benefits to local businesses, all whilst showcasing best practice civil construction techniques.

The design and construct contract comprises 23km of roadworks and bridgeworks to replace the existing two lane highway with a dual separated carriageway, providing two 3.5m lanes in each direction, with sealed shoulders, and provision for cyclists. All the intersections are at grade and U-turn movements are provided for at regular intervals between the intersections. As part of the works the existing carriageway will also be upgraded along the 23km project length, with a combination of resheeting, widening, rehabilitation and reconstruction works. “The existing highway follows the natural surface and meanders within the right of way, and as a result of this the new carriageway crosses the

existing highway in seven locations. This aspect dictates the staging of the works and the areas of significant traffic management,” said BMD Project Manager, Rob Trebilco.

“The project includes a new single span rail bridge incorporating Reinforced Earth walls at abutments. The bridge is on a skew angle of 60 degrees that creates technical issues with beam end reinforcement detail. An 800 tonne crane will be required to lift and place the 65 tonne 34 metre prestressed reinforced concrete beams.

“The design of the Cape Otway Road at grade was a key innovation that reduced construction costs considerably and provided a \$1M saving for VicRoads. Also the reuse of 75% of existing pavement with a 0-200mm class 1 granular resheet was a cost effective solution.” There were inherent challenges with the location, starting with the climate which delivered several prolonged periods of extremely heavy rainfall. Also, the geotechnical aspects of the site were far from ideal, with 300mm to

500mm of topsoil and silt overlaying low CBR silty clay materials that extend through 70% of the project area. The generally poor subgrade materials required extensive rework and removal of unsuitable materials to achieve a working platform for the road construction.

BMD needed to source 1,000,000 tonnes of quarry materials 50km from the site, and this figure would have been higher were it not for the use of crushed in situ rock material for part of the capping quantity.

Safety has always been a priority both for the workers on site and for the traffic on the existing road while the new carriageway is under construction 10m offset from it, and traffic management was required to allow for an estimated 200,000 truck movements carting quarry materials to the site. “During construction concrete barriers are required for all works within 9m of the existing highway, as a standard protection measure for workers. The main interface will be the tie ins and crossovers, where concrete barriers will be required for the safe execution of the works,” said Rob.

“The project has been LTI free, however a significant number of serious road accidents and fatalities have occurred on this section of road over the decades. The last known fatality was Oct 2011, when a car and empty log truck collided at 2am. Between 2000 and 2005, 24 people died on the Princes Highway in 165 crashes. A number of these accidents occurred on the section of road now being duplicated.

“For the permanent works all earthwork batter slopes are 6:1 within medians and have been designed so that minimal guard fence or Wire Rope Safety Barriers (WRSB) installation is required to achieve the 9m clear zone requirements for 100km/hr road speed. It is recognised that WRSB and Guard fence, whilst used to provide protection from hazards, are also a hazard and can be eliminated with certain batter design slopes. On bridges high containment permanent concrete barriers are required with medium containment off structure barriers at bridge approaches.”

The site contains many protected habitat zones, and this was a key feature of the design created for BMD by Hyder Consulting.

The nature of the site’s silts and silty clays, combined with a mandated construction timeframe, meant that large areas of earthworks are exposed during construction. The site also had limited opportunities to construct significant temporary sediment ponds, particularly in low lying areas of existing waterways, so BMD constructed extensive rock check dams in swales to retain water onsite and allow sediments to settle. BMD have successfully managed the site without major environmental incidents since construction commenced onsite in June 2011, with quarterly independent environmental audits giving positive assessments of the success of their environmental management.

BMD have a team of 30 personnel onsite, consisting of Engineer’s, Foremen and Field Employees, along with 50 subcontractors, giving a peak daily workforce of up to 100. The company prioritised using local plant, suppliers, subcontractors and labour, delivering a substantial injection of jobs and income to the surrounding communities.

Concurrent with this project, BMD also completed a section of the M80 Ring Road upgrade and the Calder/Kings Interchange, both projects for VicRoads. They are currently at work on projects including Wyndham Harbour, and the Wurruk to Sale Duplication of Princes Highway East.

BMD Constructions is a family owned business with annual turnover of just over \$ 1 billion, and its consistent success and achievements is due in part to the business model and approach to clients’ needs. “We have a great relationship with VicRoads, and maintain a delivery approach for all our projects that is based on a collaborative model which creates and maintains meaningful relationships amongst all persons involved,” said Rob.

“In particular BMD recognizes that every project provides an opportunity to establish a long term local relationship and foster the development of other opportunities.”



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SKILLED THINKING MAKES CIVIL WORKS SUCCEED

Whether clearing firebreaks for the CFA or building roads, Boardman Contracting are experienced in managing whatever challenges a site bring their way. For their work on the Waurn Ponds to Winchelsea section of the Princes highway upgrade, the major consideration was managing safety as they undertook a wide range of civil contracting tasks.

Their scope included stripping topsoil and stockpiling, cutting down the base for the road, compacting road base and loading overburden. Up to six of the company's experienced and ticketed operators and plant including scrapers, dozer, excavator and wheel-loader worked on the site at various times over six months.

"The biggest challenge was working around the traffic. When someone is on a dozer cutting down both sides of the road to 6m deep, and there are trucks flying by, that is risky," said Boardman Contracting Director, Roger Boardman.

"We held tool box meetings every morning, and undertook safety checks of the machines every morning. We also did Hazard Assessments – one of our staff has done the appropriate training for hazard assessments and OH&S. The risk management we did was effective – our work was completed LTI-free.

"The soil conditions were also not ideal. When we cut it down to the base for the road, we had to rip, mix and re-compact it because there was a lot of inconsistent material."

Part of the topsoil stripped from the site was reclaimed for redeployment to local garden centres. Boardman Contracting do a considerable amount of soil redeployment, supplying three major garden centres in Geelong. With one of the operators also a mechanic by trade, basic maintenance is undertaken in-house during any downtime. Not that there is a lot of it, with their skills seeing them in high demand across sectors including agricultural, residential sub divisions, water authorities, pipeline projects, industrial projects and as preferred contractor for the chicken industry.

Other major projects have included major environmental works like constructing and lining settling ponds for Alcoa; plantation preparation for Midway Timber products; civil and road works for Draper's Civil subdivision project at Geelong; and processing gypsum for Blue Circle Cement.

Boardman Contracting has been in operation since 1986, founded on Roger Boardman's previous experiences in Sydney, including performing excavation works on the early stages of Darling Harbour and the QVB car park. The company provides wet hire of graders, dozers, excavators (including a GPS-equipped excavator), scrapers, compactor, front end loader, crushing and screening plant, tip trucks and rollers.

"I employ good, reliable, honest and extremely experienced operators. I also train up new operators, which means investing a few years before they are thinking in the way they need to," said Roger.

For more information contact Boardman Contracting, phone (mobile) 0408 525 046, email boardmancontracting@bigpond.com

CONFESSIONS OF AN ENVIRONMENTAL AUDITOR

KEEPING THE EPA ON-SIDE WITH THE AID OF A 'WEB BASED COMPLIANCE APP'

We asked Stephen Jenkins, lead auditor with EnviroRisk Management Pty Ltd to rate his top five (5) issues that road construction and maintenance contractors should focus on to control environmental risk and ensure visits from their local EPA remain positive. Here's his response:

In 1st place = Negate Sediment Run-off

"An inadequate, or improperly installed, sedimentation control device" is a significant finding in most environmental audits of road construction works. Concise planning up front prevents headaches down the track.

2nd place = Control Excessive Dust

Dust controls need to be flexible. Respond as needed to the weather conditions at the time.

3rd Place = Provide Designated Refuelling Stations

Dedicated refuelling locations must be suitably bunded, with an appropriately sized and well-stocked spill kit nearby. Mobile fuel containers should be purpose-designed for the job and not make-shift or jury-rigged devices.

4th Place: Monitor Effectively & Efficiently

Environmental quality monitoring data is frequently not routinely reviewed, nor are results interpreted well so that action is timely. Prominent issue occur within:

- dust deposition & PM10 data;
- environmental noise; and
- water quality (pH, turbidity).

5th Place: Make use of a web based app to track, act and report

To avoid missing important compliance reporting deadlines use a tool like ComplySure!

Compliance tasks, including site inspections and audit observations, may be entered directly into your laptop, iPad or smartphone on-the-spot by a simple click or screen tap. The data is instantly available through cloud functionality. ComplySure negates double handling of information; hence there's huge time savings. The inexpensive web app:

- ✓ alerts what tasks need to be performed and when;
- ✓ retains inspection results in text and graphical form, facilitating document retention and retrieval; and
- ✓ flags non-compliances, sending notifications and preparing reports for immediate action.

The environmental and safety compliance status can also be displayed in real time, being invaluable for presentations at management, audit and Principal contractor/client meetings.

EnviroRisk has been a leading auditing practitioner and compliance manager since 1995. ComplySure is their latest in-house HSE compliance management tool. Contact Stephen Jenkins- sjenkins@envirorisk.com.au (03) 5282 3773, mobile 0412547689.



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