

KINGSTON BYPASS

CLIENT : Department of Infrastructure, Energy and Resources
MAIN CONSTRUCTION COMPANY : VEC Civil Engineering Pty Ltd
PROJECT END VALUE : \$50 Million
COMPLETION : December 2011



A PROJECT AHEAD OF ITS TIME

Finishing a major civil infrastructure project on schedule is laudable – finishing one six months ahead of schedule is truly brilliant. The team behind the Kingston Bypass project in Tasmania have every reason to regard the project as an outstanding success, with 2.8km of new road constructed, including a major overpass, new bridges, water infrastructure, cycleways, pedestrian underpasses, ramps, roundabouts and extension to a nature trail all completed in a compressed timeframe in challenging terrain.

The project, which represents a total investment of almost \$50 million, was funded jointly by the Tasmanian and Federal Governments, with planning and design work undertaken by the Tasmanian Department of Infrastructure, Energy and Resources (DIER). The project goals included more efficient traffic flow around the Kingston area, and increasing the capacity of the local road system to cater for future developments in the area.

An extensive and ongoing community consultation process was undertaken, and DIER worked closely with the Kingston Bypass Action Group and Kingston Bicycle User Group both during the design phase and construction to ensure the project would meet identified community needs and address any relevant concerns. The final design was developed by DIER consultant Pitt & Sherry in collaboration with the Kingborough Council.

The bypass commences south of the Kingston Interchange and passes underneath Summerleas Road west of the existing Channel Highway, then rejoins the existing Channel Highway at Algona Road. The two lane roadway has provision for upgrade to dual carriageway in the future.

Interchange ramps and a new bridge have been constructed at Summerleas Road, and a major new roundabout constructed at the junction of Algona Road and Huntingfield Avenue, which incorporates footpaths for pedestrians and dedicated cycle lanes. This roundabout will also facilitate future upgrade to an interchange and improved access to Huntingfield.

Spring Farm Road has also been upgraded for future connection to Kingston View Drive, and a shared path for pedestrians and cyclists constructed. Shared footpath and footpath has also been reinstated on Summerleas Road, a pedestrian underpass constructed on Algona

Road and the pedestrian underpass near the former Kingston High School extended.

The alignment of the new road lies adjacent to Whitewater Creek for the majority of its length, and the recreation trail along the creek has been extended as part of the overall project's landscaping works. The recreational trail also links Summerleas Road and Spring Farm Road.

With multiple services lying under the project area, coordination of the activity of subcontractors and liaison with the communications providers, power suppliers and water authorities was required to ensure minimal disruption to users during works.

Relocation of Aurora and Telstra services was undertaken, and relocation of the Southern Water Mains, which incorporated the installation of additional Mains to meet the needs of future expansion of residential and mixed use development in the Kingston and Huntingfield areas. Traffic noise is always a concern in semi-rural residential areas, as is the appearance of any noise barriers. Sound attenuation walls along the bypass road length have been constructed from prefabricated concrete with a variety of textured designs for visual amenity. Flexible safety barrier has also been installed along the length of the bypass.

The contract was undertaken by a Tasmanian-based company, VEC Civil Engineering Pty Ltd, who have been in operation since 1994. The company began operation as a bridge construction company, under the banner of Van Ek Contracting Pty Ltd, and have since grown to a major force in the Tasmanian civil construction sector, with projects including rail, water infrastructure, structures, steel fabrication, piling, foundations, precast and prestressed concrete and bridge load testing.

This combination of capabilities and experience gave the breadth of skills and experience necessary for the successful completion of the Kingston project.

DIER are currently managing a variety of road and bridge projects across the State, including a community roads program, upgrades to North East freight roads, and upgrades to Bruny island's main road, to provide continuous sealed road between the two major populations centres.

THREE IN ONE APPROACH GETS THINGS DONE



Our tripartite group were first approached by VEC Civil Engineering to submit a package to drill, supply, install and stress 7000mtrs of soil nails for the retain the shotcrete walls beneath the Summerleas Rd abutments on the Kingston By Pass project.

Delighted with the opportunity, SMRH Australia, Maxfield Drilling, and MPH Contracting once again teamed up to provide the full package of equipment, skills, and products required to perform the works. We wish to acknowledge the very successful working relationship formed with VEC Project Manager Mr Pat Dwyer and the VEC Structures Engineer Mr Mark Calcraft whom both provided our group great support and continual site access enabling our team to progressively get the job completed.

Maxfield Drilling bored the 90mm holes for the soil nails using a Sandvik DX800 rock drill machine. SMRH supplied the DSI threaded deformed bar, cement grout, centralizers, and pumping equipment. MPH Contracting performed the installation and grouting nails followed on by SMRH who then performed the load testing to the project specification.

The soil nails were required to stabilise the embankments beneath the abutments and adjacent walls in a variety of lengths including 6 metre, 9 metre and 11 metre deep. A blinding layer of shotcrete was first applied prior to the holes being drilled. The scope of works undertaken also included drilling and installing socked slotted drainage pipe.

There were a quite few challenges: On the western wall the drilling required extra care to keep the holes open as the ground was predominantly heavy clay with poor composition. The MPH install team also worked hard to install and manoeuvre 11mtr nails in limited spaces owing to other contractors performing earthworks nearby. We elected to fit the nails with grout socks to avoid grout loss into unforeseen voids that are often found in poor composition ground conditions.

Our group provides these comprehensive services in both Tasmania and the mainland. We provide all the necessary components for rock anchors and soil nails including; threaded stress bar, threaded deformed bar, centralizers and shrinkage compensated grout, and services including bar installation, grout pumping, tensioning up to 100 tonne capacity, measuring displacement and reporting.

Other more recent projects our group has undertaken include:

- Transend Tower 45 – drilled, supplied, installed and tested 15mtr deep \ Rock Anchors using M36 Threaded Stress Bar for the tower footing.
- Brighton Rail Underpass – drilled, supplied, installed and tested 6mtr deep rock anchors using 25mm threaded deformed bar.
- Bathurst St Apartments – drilled, supplied, and installed 12mtr deep soil nails using 20mm threaded deformed bar.

With mechanical aptitude and technical product experience, our three companies work together as one to provide the skills and products that turn construction challenges into completed achievements.

We thank VEC Civil Engineering for the opportunity provided to our group to provide the complete soil nail package for Kingston By Pass Project.



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INNOVATION GETS BYPASS WORKS MOVING ALONG

Haugland Constructions efforts on the Kingston Bypass demonstrated an ability to tackle a complex civil project efficiently, safely and with complete dedication to timely, quality results. Haugland Constructions was engaged by VEC to assist with the structural works for the pedestrian underpass on Alonga Road, the sound attenuation barriers, Summerleas Road Overpass and Spring Farm Road Overpass, and the preparation, formwork, reinforcement and in-situ concrete to the water main valve pit.

The works program included excavation; installation of posts and Hebel and Ply panels for the sound barriers; preparation and placement of the foundations for the overpass bridge abutments and central piers; installation of all formwork; in-situ concrete for the bridge abutments, wing walls and central piers; assisting with the placement of the two cross heads on top of the central piers and the installation of 28 precast T beams for the two main overpasses.

Works commenced in mid 2010 and were completed in October 2011, with Haugland managing a peak daily workforce of 14 direct staff on site. The company also deployed their own plant, including 10 yard truck and trailer, excavators with augers and rock breakers, and a telescopic material handler.

“A number of challenges were encountered during the construction of the two sound attenuation walls due to the complex nature of their design. Unique to our works were the innovative techniques we used,” said Haugland Constructions Managing Director, Ben Haugland.

“In order to ensure the 7m+ long posts were installed perfectly plumb, and to speed up their installation we designed and manufactured support jigs to stabilise the posts in the correct position during their installation. Haugland Constructions is very proud to have worked for VEC Pty Ltd on the Kingston Bypass and we would like to thank them for the opportunity to work on such a prestigious project.”

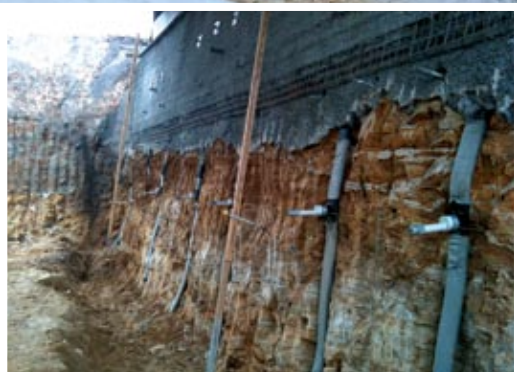
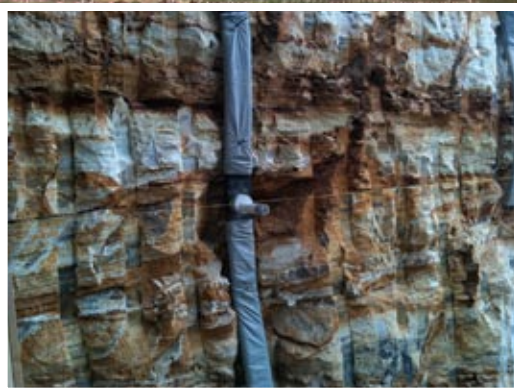
The company services projects across the civil, commercial, energy infrastructure and general construction sectors. Other recent major projects include Pontville Immigration Detention Centre for Fairbrothers Construction; Illawarra Primary School Redevelopment for Cunic Constructions; and Waddamana-Lindisfarne 220kv Transmission Line for Dwyer Constructions.

Haugland Constructions is a Tasmanian owned and operated company with a highly experienced team of civil construction staff who are dedicated to safety, innovation and quality. The company's vast range of plant and equipment are all of the highest quality, and maintained regularly to ensure their ticketed operators are equipped to efficiently and reliably get down to business.

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ENSURING WATER FOR THE FUTURE

With some of Tasmania's most experienced hydraulic infrastructure professionals on staff, Water Industry Solutions (WIS) combine engineering ability, manufacturing excellence and logistical skill, delivering successful results for projects like the Kingston Bypass.

Not only transport links were upgraded in the Kingston area, water infrastructure was also boosted. WIS came on board to install new large diameter Mild Steel Concrete Lined pipes ranging from 273mm to 660mm under the new causeway to increase the supply capacity downstream and to replace older, asbestos cement pipe. These new pipes will carry the water supply for the region south of the bypass including Kingston, Margate and as far south as Snug.

WIS also laid new water reticulation and sewer reticulation UPVC and Ductile pipes across the newly constructed Summerleas and Spring Farm Road Bridges, to augment existing systems and to provide for future subdivisions downstream.

"The construction involved a complex interchange valve pit to divert flows, a challenge given the steep topography," said WIS Project Manager, Peter Barwick.

"This is a high pressure pipeline of 2000 Kpa. Unstable soils on the large batter on the western side called for improved construction techniques including gradient anchor blocks, which we designed and supplied. We also manufactured bends, special end connectors, seven scour valves and air valve offtakes ourselves, here in Tasmania."

Due to the other utilities including power and telecommunications also installing new services, logistics were critical. Potholing had to be undertaken to adjust levels and grades, and bends at some points redesigned.

"This was a detailed project, successfully completed. All of the cut overs from the new main to the existing were undertaken by WIS on behalf of Southern Water, and that was done with minimal interruption to supply and minimal to no impact on downstream consumers. All the pipework pressure tested successfully on the first attempt," said Peter.

WIS was established in 2008 by water industry professionals with experience gained from a combined century working with Hobart Water and Southern Water. As specialists in design, fabrication, construction and maintenance of water, sewer and stormwater systems they have contributed to many recent upgrades of Tasmania's hydraulic infrastructure. These include 7.5km of pipeline and multiple pump stations for the South East Irrigation Water Reuse Scheme; 3.2Km of 813mm dia MSCL for Southern Water to improve the reliability and capacity of water supplies for Hobart and the Eastern Shore and currently, 17km of UPVC and Ductile Pipe as part of the Huon Valley Regional Water Scheme.

The company is a member of the Industry Capability Network, the Civil Contractors Federation and the Water Industry Operators Association; is accredited by Southern Water to install new connections and are compliant with WSAA standards. "We are passionate about water and sewer infrastructure and we are specialists. All our work has a paper trail ensuring quality – these are hundred year assets, how we manage them affects our children and our grandchildren," said Peter.

WATER INDUSTRY SOLUTIONS

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WELL-GROUNDED IN TASMANIAN CONDITIONS

To ensure stability of the Kingston Bypass for many years to come, the construction team put their faith in geotextiles and panel drains supplied by Geotas, Tasmania's leading supplier of environmental and civil construction products.

Bidim geotextile was used as a separation layer for road construction and for filtration for subsoil drains. Bidim is an Australian made continuous filament, non woven, needle punched, polyester geotextile designed to provide effective solutions to a multitude of engineering applications.

Megaflo panel drains were used as the major subsoil drainage system. This product is a flat panel perforated recycled HDPE core wrapped with Bidim geotextile to prevent soil ingress into the drainage system. It was chosen over conventional drainage pipe due to its ease of installation, compressive strength and subsequent cost savings. Megaflo only requires a 150mm wide trench and can be laid directly on the subgrade without the bedding layer that is usually specified for round pipe.

Megaflo also provides faster and higher inflow capacity due to its high trench installation profile and earlier interception of pavement infiltration. The panels' elongated ribbed profile incorporates internal support for structural strength and can be utilized for both Class 400 and Class 1000 round pipe applications.

Megaflo was also used for the drainage system behind a 7m high Soil Nail wall, with Geotas also providing technical advice and design suggestions to the consulting and project engineers. Megaflo was built into the design due to its flat profile, high crush strength and flow capacity, and available fittings. The flat panel profile ensures no intrusion of shotcrete into the drainage pipe, and its high crush strength prevents damage to the pipe.

The product's high flow capacity also reduces water pressure build up behind the shotcrete, and the various fittings are ideal for weep holes and pipe joining.

Since 1985, Geotas has been meeting the needs of civil and environmental projects throughout Tasmania. As well as geotextiles, geogrid and drainage products, they also supply and install roadside safety fencing, rural and security fencing, GCL and HDPE liners and gabion baskets. The company takes pride in ensuring every customer has the right products, in the right place, on time – with full technical backup available.

Geotas have developed a specialized knowledge of the state's unique topography and geological conditions, which allows their people to provide the best possible advice, including civil design suggestions if required, and most suitable materials for contractors, whether it is a small landscaping project or a Federal, State or Local Government funded civil project.

Other recent major project clients include the installation of Guardrail & TWRSB at Lyell, Bass, West Tamar & East Tamar Highways, GCL & HDPE Liner Installation at McRobies Gully, Copping Landfill, Beaconsfield Tailings Dam, Menzies Centre and MMG Rosebery.

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Kingston Bypass, Tasmania

RELIABLE ASPHALT EXPERTISE

Rockit Asphaltting Pty Ltd were definitely handy neighbours for the construction team on the Kingston Bypass in Tasmania. They provided a rapid, on-call service for temporary asphalt works, patching and repairs as needed during the life of the project.

Before the works program even commenced, Rockit were onsite sealing the road for the project's site depot. They are equipped with all the plant required for road works, including bitumen sprayers, profiling machines, rollers and pavers.

Their crew and plant did the paving for the temporary roads and traffic deviations, and undertook repair works whenever required, whether due to weather damage such as potholing to newly constructed pavement, or trenches created during constructions works.

Rockit used a local asphalt supplier, Roadways Pty Ltd, which allowed them an extremely fast turnaround for pickup of asphalt when an order from the Kingston site came through.

"We were able to repair areas quicker than a more distant contractor, and we made it a priority to do works as soon as we were given notice," said Rockit Asphaltting Director, Mark Bright. "We were happy to be working in our own backyard, to minimise traffic delays from construction we were as efficient as possible."

Rockit has a staff of seventeen, and up to twelve of these experienced civil construction workers and plant operators were on the Kingston Bypass site at any one time.

The company has been in business since 1997, founded on management experience amounting to over three decades in the industry. With all the OH&S accreditation required for local government works, Rockit has undertaken extensive work for Kingston Council, Huon Valley Council, Sorell Council, Clarence Council, Tasman Council and Derwent Valley Council.

The company is qualified for DIER projects up to \$250,000, and is regularly contracted by major civil contractors such as Hazell Brothers, Andrew Walters Constructions and RCCC Civil Contracting to assist with road works. Rockit have also undertaken subdivision works for many local contractors and also undertakes private jobs including driveways.

When it comes to laying down asphalt or bitumen, Rockit can seal the deal for any project which needs reliable, rapid and quality results.

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