

CREATIVELY CONSTRUCTING AN INFRASTRUCTURE ADVENTURE

Abigroup has successfully delivered the \$759 Million Peninsula Link project.

MAIN CONSTRUCTION COMPANY : Abigroup
CLIENT : Southern Way with Linking Melbourne Authority (LMA) - Victorian Government's representative
PROJECT END VALUE : \$759 Million
COMPLETION : January 2013
ARCHITECTS : ARM Architecture



It’s often been said the journey matters as much as the destination.

In terms of the \$759 million Peninsula Link project, Abigroup, as design and construction contractor, has succeeded brilliantly at delivering excellence on both counts - constructing a safe, distinctive and aesthetically varied route between the Mount Martha and Carrum Downs on the Mornington Peninsula; a trip which slashes travel times between the two points to just 17 minutes.

The 27km dual-carriage freeway provides a new link between the EastLink at Carrum Downs and the Mornington Peninsula Freeway at Mount Martha. Forty years after it was first proposed, the first sod was turned on site in February 2010 and, with the freeway officially opened to traffic on January 17, 2013 with only minor ancillary works, including completion of shared use paths and ongoing landscaping works, being finalised.

Peninsula Link is the first Public Private Partnership (PPP) project in Australia to use the Availability model under a Victorian Government initiative designed to attract and involve private companies in the development of much needed infrastructure. With Linking Melbourne Authority in place as the Government’s representative for the project, Southern Way was established as the project company for 25 years to manage the design, construction, operation and maintenance of the new freeway and secured Abigroup as its design and construction contractor.

A strong eye for architectural and landscape design details is a major feature of the project, with elements such as retaining walls, bridges and noise walls given individual colours, textures and materials as they pass through the varying ecozones from the inner-urban area to more

open farmland and vineyards. Each of the major overpass bridges has a specific lighting effect and incorporates coloured and textured tiling and concretes which reflect the surrounding area.

There are also three different styles of retaining walls which enhance the sense of progress through country along the motorway, an aspect which is complimented by the fastidious selection of plants from trees and shrubs through to grasses and ground covers, which form the project’s revegetation and landscape component.

The environmental measures on the project included special consideration of waterway protection, especially in the area featuring breeding habitat for the endangered Dwarf Galaxias fish species. Where Peninsula Link passes through The Pines Flora and Fauna Reserve, a special light spill barrier was constructed for the benefit of nocturnal fauna, and an underpass constructed to resemble natural fauna habitat elements.

In a first for a Victorian roads project, Abigroup chose an innovative polyethylene panel, produced locally at Carrum Downs, for some of the noise walls. This Rotary Moulded Plastic (RMP) product is a light-weight, hollow panel, which offers all the functional benefits of concrete noise walls, with a far smaller carbon footprint and installation a fraction of the time required for concrete equivalents. Almost 5,500 RMP panels were installed on the project. Another advantage of these ‘poly’ panels on show on Peninsula Link is that architectural finishes and design elements can be incorporated into the panels during production, such as the geology and type finishes used on the noise walls at the Seaford, Carrum Downs, Frankston and Baxter areas.

One outstanding creative element of the project with long-term benefits for the community is the public art program initiated by Southern Way in partnership with the McClelland Gallery and Sculpture Park at Langwarrin; a program with initial seed funding from Abigroup and the Royal Bank of Scotland. The program involves a biennial sculpture competition, with winning sculptures on display at one of two locations along the freeway for four years before becoming part of the McClelland Gallery permanent collection.

In all there are three sculpture sites on the freeway. Melbourne artist Louise Paramor’s Panorama Station, is permanently located at the Peninsula Link/East Link interchange; with Rex Australis by Melbourne’s Dean Colls at Skye Road and Tree of Life by New Zealand artist, Phil Price, at Cranbourne Road the first two selected as part of the public art program.

Of course the project also required an enormous amount of down-to-earth construction and in the scope of the civil and structural works, the figures speak for themselves:

- 27 kilometres of dual lane freeway
- 25 kilometres of walking and cycling path starting in Patterson Lakes and connecting with other popular paths in the area
- 45 structures to create 28 bridges with on and off ramps to 11 roads including three freeway to freeway connections
- 140 kilometres of electrical and communications conduit to be installed
- 375 precast beams required to build the bridges

- 1,400 approximate number of piles required for noise walls
- 6,000 metres of drainage around the Cranbourne Road intersection
- 9,000 square metres of retaining wall in the Pines Flora and Fauna Reserve
- 20,000 wick drains used at the interchange with EastLink
- 80,000 cubic metres of mulch to be used in landscaping the project
- 3,000,000 cubic metres of soil to be moved
- 5 kilometres of noise walls
- 7,420 noise wall panels
- RMP Panels – 5,498
- Oxidised Panels – 1,443
- Acrylic Panels – 479
- 407,800 tonnes of asphalt laid
- 1.7 million trees and plants requiring 80,000 cubic metres of mulch
- 900 to 1,000 people working on the project at its peak
- 7,384 workers inducted
- 3.85 million working hours

In all, Peninsula Link provided an opportunity for Abigroup to build on many decades of experience in civil construction to deliver an entirely new approach to the design and execution of major transport infrastructure. The result is both a landmark worthy of the region, and a legacy which will bring manifold benefits to locals and tourists alike for many years to come.

For more information contact Abigroup, LVL 6, 476 St Kilda Road Melbourne VIC 3004, phone 03 9828 5000, website www.Abigroup.com.au

PLACE MAKING IN TRANSIT

Roads are for many people simply a means of getting from A to B as conveniently as possible. The Peninsula Link Freeway does that, however, it also has a design which makes the journey an equally important part of the whole. Award-winning and visionary firm, ARM Architecture, have used their place-making skills to give the Peninsula Link distinct aesthetic qualities, which reflect the transition through country from Melbourne city to the Mornington Peninsula.

The design scope encompassed 27 kilometres of freeway, 11 local road connections and more than 35 bridges, plus 18,000m² of retaining walls and a 22km walking and cycle path. This was in its entirety an incredibly

broad canvas for ARM to work with. The main vision which underpins the urban and landscape design is for Peninsula Link to be a 'gateway' to the Mornington Peninsula. The design is based on the concept of the journey from north to south, as travellers move from the urban setting, through the Baxter intersection, into the expansive, green landscape of the Moorooduc Plains.

ARM's design evolved out of considering the qualities of each place the Peninsula Link passes through, and the distinctive features of the colour of the landscape, vegetation, built environment, noteworthy features such as waterways, land-use and the scale of all the elements in each place.

There are five distinct areas, each generating its own set of themes in terms of materials, textures and palette, which were interpreted in a way which also gives the overall project a cohesive aesthetic. From Eastlink to Mount Martha, motorists will move through the Peninsula Portal, where they exit Eastlink and enter the Peninsula Link; through the Woodland Experiences area, which includes The Pines Nature Reserve; then Cultural Landscapes, which embraces manmade elements, natural elements and artworks; Threshold, which represents the transition at Baxter between the urban and rural setting; and finally, arrival at Green Rooms, which traverses a variety of woodlands before entering the Moorooduc Plains.

The use of colour is dramatic, with bright blue elements such as the zigzag overpass parapet at Peninsula Portal, and bright greens, yellows and oranges used on sound walls, bridge abutments, and parapets along the way. ARM paid great attention to detailing, to refinements such as the creation of patterns with tiles, light and textured concrete elements on the major bridges. The sound wall panels reflect the variety of environments, from the text associated with urban landscapes, to the nature-mimicry textures of The Pines.

Embedded in the overall fabric are the artworks, which add an extra dimension to the overall urban design. These could be seen to represent the unknown 'other' that enriches a journey, as the changing artworks are chosen by open competition, rather than being commissioned to suit the architectural plans. ARM designed in the space, and now time and

the artistry of others will fill it with a changing succession of sculptures.

ARM has been responsible for many other distinctive contributions to Victoria's urban fabric, including the upgrade to the Melbourne War Memorial. The firm are currently on the shortlist of six possible teams for the redevelopment of one of Melbourne's oldest 'journey' icons – Flinders Street Station.

They have also recently been appointed as the Architects for the new \$45M Geelong Library and Heritage Centre. Their design for the community facility combines a remarkable disintegrating sphere theme with elevated greening both inside and outside, blurring the edge between the adjacent park and the premises and creating a truly unique design legacy for the city. ARM is also completing the masterplan for the redevelopment of Elizabeth

Quay at Perth. The crux of their design is to reconnect the city and the Swan River, creating a precinct which draws on the area's history as a meeting and gathering place.

As a firm, ARM are renowned for continually expanding the possibilities of the built form, with ground-breaking and multi-award winning designs such as the Melbourne Recital Centre, the Perth Arena and Digital Harbour Docklands garnering not only national but also international acclaim. Like the experience of travelling the Peninsula Link, ARM's architectural visions, urban planning and masterplanning talents are fundamentally about exploration and progress.

For more information contact ARM Architecture, Level 11/522 Flinders Lane Melbourne VIC 3000, phone 03 8613 1889, website www.armarchitecture.com.au





ASSURING HIGHER STANDARDS

Minimising risks in the interests of safety went far beyond toolbox meetings and task-based risk assessments on the Peninsula Link project. Behind such site-based measures was a lengthy, meticulously detailed and complex analysis and reporting process on the project's design, construction, operational and long-term maintenance factors, carried out by Australian Quality Assurance & Superintendence (AQUAS).

AQUAS were engaged as an independent reviewer of the design documentation for compliance with the project's Workplace Health & Safety requirements, their input assisted in improved planning and operational strategies.

The initial review was carried out during the early design stage, to highlight any potential issues for consideration as part of the detailed design process.

Once the final design stage was reached, AQUAS undertook a formal review of all the design packages to identify any WHS risks associated with operations, and risks associated with maintenance activities once the motorway comes into operation.

This added a further layer of analysis, requiring AQUAS to review maintenance activities and make an assessment of potential risks to maintenance staff.

"Typically, these risks would involve working in traffic, provision of barriers (handrails or safety systems) when inspecting structures such

as bearings, access to remote plant and safe access to plant," explained AQUAS Consultant, Ken Cameron

"A framework assessment tool was established, and this was applied to every package, with a summary report produced. In all about 110 packages were reviewed on the project, and a formal review was undertaken on each completed design package. AQUAS Senior Consultant, Nilda Soto, plus up to four AQUAS staff worked on the project.

"A detailed project plan was established which set out the review criteria and reporting process. All reports were subject to independent review," explained Ken.

"To the best of our knowledge, this was the first time this had ever been undertaken on a road maintenance project. AQUAS had previous experience in undertaking WHS reviews of operating motorways, and used this as the basis for the development of the investigation process used for this project. A site inspection at the early stages of the project was essential as it enabled us to visualise the area, and to provide context in which to undertake the review"

The major challenge for AQUAS was developing a review and reporting protocol that met the requirements of the contract while also adding value to the design process. This required them to invent a new way of doing reviews in a systematic, replicable manner. There was also a need for discernment in assessing the relative importance of issues.

"The process had to be structured so that staff could undertake the reviews in an efficient manner, and document the outcomes in a way that was consistent across all work packages," said Ken.

"AQUAS had to work with the client so that we could document issues in a manner that could be addressed, and not document minor issues that would not impact on operations."

One of the factors which contributed to their success in delivering on such a demanding brief in previously uncharted compliance reporting territory, is the company's 20 years of experience in the application of compliance and assurance services on infrastructure projects.

As a compliance and assurance organisation, AQUAS has provided design, documentation, implementation and ongoing review of Quality, WHS and Environmental Management planning for construction and infrastructure projects around Australia.

The company's Compliance and Assurance professionals focus on identifying compliance issues which can be addressed, basing their advice on solid experience in system implementation. AQUAS have through the years seen what works, and what doesn't, when it comes to management systems.

The company's own Certified Quality Management System meets AS/ISO9001-2000, and has been in place since 1994. The company also has Certified Environmental and WHS Management systems. One of the services they offer clients is advice on achieving compliance with the

appropriate QMS, EMS and WHS standards, and independent auditing for certification of those management systems.

Australia's largest independent Second Party audit and compliance organisation, AQUAS is a wholly owned subsidiary of APP Corporation, one of Australia's largest independent Project Management providers. APP is owned by Transfield Services Limited.

Other infrastructure projects AQUAS have assisted include the M7 Motorway, Pacific Motorway, Pacific Highway Upgrade projects, Port Botany Expansion and Sydney Desalination Plant. Currently, AQUAS are undertaking independent environmental audits for the Gladstone Ports dredging projects.

There are many ways in which AQUAS can assist with major projects – as Independent Verifier at each or any stage of the construction process, project auditor, environmental representative, management systems integration advisor, and risk management systems advisor and auditor. On all their projects, the goal is to empower people and processes to create a sustainable world, providing business improvement solutions which support the highest possible standards of quality, safety and environmental performance.

For more information contact Australian Quality Assurance & Superintendence Pty Limited, Contact persons: Nilda Soto or Davinder Sindhu, Level 7 116 Miller Street North Sydney NSW 2066, phone 02 9963 9908, fax 02 9954 1951, email info@aquas.com.au, website www.aquas.com.au



SOLID BUILT OUTCOMES FOR PENINSULA LINK

With thousands of motorists relying on the structural safety of the bridges of the Peninsula Link project, the skills of Total Building Construction were a critical part of the project's success.

Since 2000, Total Building Construction have been providing a wide range of concrete construction services to the residential, commercial and civil construction sectors. One of their specialties is customised formwork and footings solutions.

The Peninsula Link project had quite demanding design specifications for many of the bridge elements, both in terms of performance criteria and aesthetic considerations. The highly skilled formwork fabricators at Total Building Construction's workshop facility were able to design and manufacture jump forms and reinforcement which were used for constructing bridge parapets, buttresses and safety barriers.

A crane was used for moving the sections of formwork and reinforcing into position, with scrupulous attention paid to safety by the Total Building Construction onsite crew and supervisor. The critical part of their scope in terms of the overall programme coincided with the December 2012-January 2013 period, and the company's workforce demonstrated complete commitment to the task even through the holiday period. This shows the strength of the Total Building Construction team.

At the same time, this time period is also the peak period for motorists to access the Mornington peninsula, making the timing of deliveries, access, and consideration of wider project safety and traffic management factors imperative. It is a testament to the management capabilities of the company.

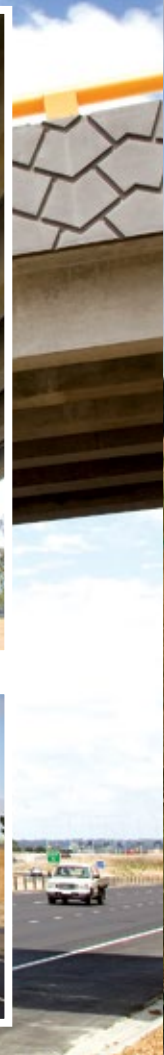
Total Building Construction also constructed footings for numerous parts of the project, which required a combination of civil construction expertise for the detail excavation work, which required extreme precision, and subsurface concrete construction works. This also gave their workshop team a further chance to shine, with the fabrication of the curved steel elements for the piling anchors, which were installed by the company's concrete construction site team as they completed the pilings and footings.

All work was inspected for quality and accuracy by the Total Building Construction site supervisor, to ensure Abigroup would be satisfied with the results. Client satisfaction is always important, particularly in the current climate of tight budgets. This is another point on which Total Building Construction deliver – they take pride in providing cost-effective construction solutions, on-time and completed to the highest standards of quality and safety. When there's a lot riding on the results, their focus on giving the best level of service and workmanship is a sure road to project success.

For more information contact Total Building Construction, phone 03 8358 5139



CUSTOM PRECAST FOR COMPLEX CIVIL ACHIEVEMENTS



STEERING SAFETY OUTCOMES FOR OUR ROADS

Westkon Precast thrive on challenges, combining innovativeness and experience to provide buildable solutions for major infrastructure undertakings like the Peninsula Link project. Westkon shop detailed and manufactured all the precast concrete structural elements for the projects many bridges, including almost 400 precast Super T beams, on-structure barrier units, bridge planks, parapets and off-structure barriers.

Both Westkon's Melton and Sunshine facilities commenced casting for the project in December 2010, with the final installation taking place in August 2012. A pro-active approach was taken, with casting done in stages to dovetail with the overall works program.

"The challenge was that each bridge was different," said Westkon Peninsula Link Project Manager, Andrew Steer.

"There were a lot of set-ups required, and we used an extensive range of moulds for the casting. The beams varied in depth from 750mm deep to 1800mm, with the biggest weighing in at 96 tonnes and cast as single pieces. We stored a large number of the beams ahead of program at our yard, so we could accommodate changes in program requirements.

"There were roughly 1200 no. parapet on structure and off structure units in three different colour-controlled concretes. Many had an architectural patterned finish to the outside which is seen by motorists as they drive under the bridge. We ordered customised rubber liners in a whole range of sizes to achieve the required programme.

"We also produced 291 planks, 1200mm wide, between 10m and 15m in length, with two voids in them to reduce their mass and the amount of concrete used. This kind of complex project is what we do. It is always challenging to come up with buildable solutions, and we work closely with the client and project engineers to improve buildability and quality."

Westkon are one of the most experienced and innovative precast companies in the nation, capable of delivering the entire concrete construction package for civil, commercial and general construction projects. They hold prequalification for the State Road Authorities in New South Wales, Victoria and South Australia, and also the new National pre-qualification for civil projects. Their range of products includes HOLLOWCORE floor planks, prestressed bridge beams and planks, architectural and structural precast panels and columns, sound and traffic barriers, bridge off-structure and on-structure barriers (parapets), prestressed stadium seating planks, precast stairs and landings.

As architecture continues to evolve new ideas, Westkon will continue to find ways to turn those designs into solid reality, creating precast solutions which can deliver cost-effective, high-quality, and long-lasting construction achievements.

For more information contact Westkon Precast, Head Office 528A Ballarat Road Sunshine VIC 3020, phone 03 9312 3688, fax 03 9312 1735, email info@westkon.com.au



Making safer roads requires specialist knowledge, and a team of dedicated professionals to ensure all the right measures are built in and implemented. That is what Trafficworks do, and there is no better showcase of their skills than the Peninsula Link project.

Trafficworks undertook Road Safety Audits during the preliminary and detailed design phases, reviewing all the design plans, and preparing over 80 separate Road Safety Audit reports. The company has also just completed the pre-opening and post-opening Road Safety Audits.

In the five years Trafficworks has been in operation, their clients have included state road authorities, state government departments, local governments and major roadworks contractors.

Their core capabilities include Road Safety Audits for all stages of design and implementation and Scoping Reports for new projects, including road safety, congestion management, public transport, cycling and pedestrian initiatives.

The company also provides services in the areas of Traffic Design, including preparation of functional layout plans, traffic signal layout plans, street lighting designs and assessments; Traffic Impact Assessments; and Traffic Management Strategies and Plans for major roadwork projects and major events.

The company was formed out of a passionate drive to deliver the best possible solutions for clients in a trustworthy, skilled and honest manner.

Some staff have over 30 years experience in the traffic engineering and design fields, servicing projects out of a Melbourne office and two regional offices at Bendigo and Benalla.

Trafficworks are committed to meeting the challenges of both present and future transport issues, and are working to develop the next generation of leaders in the field through ongoing training and opportunities for staff to develop both their technical and interpersonal skills.

Other current major projects include the M80 Ring Road Upgrade project; the Princes Highway West Duplication project and the Western Highway Duplication project.

In delivering the highest levels of expertise and service to the traffic engineering industry, Trafficworks can play a key role in ensuring the safest possible process and outcomes for transport infrastructure projects.



For more information contact Trafficworks Pty Ltd, Suite 1, 1st Floor Upper Heidelberg Road Ivanhoe VIC 3079, PO Box 417, Ivanhoe VIC 3079, phone 03 9490 5900, fax 03 9490 5910



ENSURING QUALITY, CARE AND DILIGENCE

When major infrastructure like Peninsula Link passes through ecologically sensitive country, the independent referee needs to pay close attention to the project and facilitate the achievement of environmental protection objectives. QMIS has undertaken this crucial role for the project, as the independent environmental auditors for Abigroup.

QMIS has over a decade of experience in management system development and auditing, and a substantial track record in environmental management matters. Their role began once the project had been approved and when civil works were in the early stages. The auditing services will be provided right through the construction process, to ensure all approval guidelines and agency requirements are met, and that any unexpected issues are promptly and effectively dealt with. Community relations, facilitation and risk management are core company capabilities of QMIS, and the ability to liaise successfully with multiple stakeholders was key to the process with this project.

“The challenge of this project was that there were a number of interested parties including Linking Melbourne and Abigroup, our client. Having diverse stakeholders means we need to use our negotiation and liaison skills to ensure everyone’s concerns are met,” said QMIS Director, Jenny Parker. “Abigroup were very forthcoming, and have done a good job of resolving any incidents. Every project has issues, on this one that included managing all the water from the heavier than usual rainfall, especially in protected areas. Environmentally this project has been well managed by the team.”

The services provided by QMIS are anchored in science. Their auditing of major projects is often part of contractual obligations, especially with PPP projects such as Peninsula Link. Clear communication is used from the outset to agree on needs and strategies, then transparent audit plans are developed. Fittingly, for an organisation with the mission to help others achieve outstanding management results, QMIS provides an integrated auditing service comprising ISO AS/NZS 9001 for Quality Management, ISO AS/NZS 14001 for Environmental Management and AS/NZS 4801 for Occupational Health & Safety Management. In addition QMIS provides a broad range of other services including environmental management, training and system development.

Some of the other clients that have relied on advice and assistance from QMIS include Optus, John Holland, Thiess, Visionstream, Melbourne Water, the Mobile Carrier Forum and Communications Connect.

“Our clients only deal with the Directors, so we are providing a very high standard of service from the outset,” said Jenny. QMIS can provide services on a flexible basis, whether for project duration or on a day-to-day basis. They have the expertise and resources to provide services on any scale, and cater for any degree of complexity.

For more information contact QMIS, phone: 03 9787 2714, email info@qmis.com.au, website www.qmis.com.au

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