

Roads and Structures

DRIVING PROGRESS

TE

Gold Coast Light Rail Queensland

At McConnell Dowell our purpose is providing a better life.

> Breakwater Bridge Victoria



McConnell Dowell – Major Projects

Our culture is founded on expertise, creativity and progressive thinking. We constantly challenge ourselves and our partners to find the best solution for every project. This attitude, along with our safe, high-quality, systematic and structured approach, has earned us the trust and loyalty of our clients.

McConnell Dowell creates road and structures infrastructure that set the standard - from designing and constructing major complex freeway interchanges to remote critical access for resources projects.

Our depth of expertise across roads, structures, marine, pipelines, mechanical, civil and tunnelling to deliver integrated design and construct solutions, combined with more than 50 years of experience and a commitment to our clients and local communities, is what sets McConnell Dowell apart.

Annual Turnover

FY18/19 FY19/20 FY20/21 (Forecast Feb 20)

We provide outstanding road and structures infrastructure solutions for our clients across diverse environments, no matter how challenging or sensitive. That is the **McConnell Dowell difference.**

We actively target projects across a range of values and market sectors in order to maintain a diverse order book. Current contracts underway include the \$65m Jane Street and Mulgoa Road project in New South Wales, the \$140m Public Transport Projects Alliance in South Australia, the \$89m HMAS Coonawarra New Wharf Structure in Darwin, and the \$417m Mordialloc Freeway and \$862m Western Program Alliance projects in Victoria.

Current major prospects include the ~\$200m Hay Point Ship Loader and Berth Replacement Project for BHP near Mackay in Queensland which is currently in a sole source ECI phase and projects as a delivery partner under SA Water Frameworks in a joint venture with Diona.

\$1,180M \$945M \$1,030M

Mordialloc Freeway



Project Description

The McConnell Dowell Decmil Joint Venture has been awarded the contract to design and construct the 9km Mordialloc Freeway in Melbourne's south east which will link the Mornington Peninsula Freeway at Springvale Road in Aspendale Gardens to the Dingley Bypass in Dingley Village, creating a continuous freeway from Frankston to Clayton.

As part of the project, bridges will be built over Springvale, Governor, Lower Dandenong and Centre Dandenong Roads, along with new freeway entry and exit ramps.

A bridge will also be built over Old Dandenong Road to keep it open for Dingley Village residents, and a twin bridge will be built over sensitive wetlands to ensure rainfall and natural light reaches vegetation below. A new shared walking and cycling path will also be constructed along the entire length of the Mordialloc Freeway, providing safe and reliable journeys for members of the public enjoying more active forms of transport.

Motorists using the Mordialloc Freeway can expect quicker and safer and journeys, with north and southbound traffic separated and road safety barriers installed along the inside and outside of each carriageway.

Construction of the Mordialloc Freeway will create 400 jobs, which will include 10% of total labour hours allocated to training apprentices, trainees and cadets, building much needed skills within the industry.

In addition, the joint venture is committed to sourcing at least 96% of material and employment locally, benefiting the local community and broader economy.



Design

In response to community feedback, changes were made to the design to include:

- Bridges over Governor Road, Lower Dandenong Road and Centre Dandenong Road instead of traffic lights
- A bridge over Old Dandenong Road to keep it open for Dingley Village residents
- A twin bridge over the sensitive wetlands to ensure rainfall and natural light reaches the vegetation below
- Longer and taller fences next to Braeside Park to protect local wildlife
- A wider pedestrian underpass at Braeside Park to improve connectivity
- A new intersection at Lower Dandenong Road so Woodlands Drive can remain open.

Social Procurement

The project teamed up with Ability Works, a social enterprise in Melbourne's inner east, to design and manufacture some of the tools needed to build the Mordialloc Freeway.

Ability Works, who provide employment opportunities for 130 people facing barriers to employment including people living with disabilities, has supplied 350 settlement plates to help monitor soil levels during construction of the foundations of the Mordialloc Freeway.

Client:	Major Road Projects Vi	ctoria		
Location:	Melbourne, VIC			
Contract:	Design & Construct			
Role:	Principal Contractor			
Dates:	Oct 2019 - Dec 2021	Value:	\$417M	

Teaming up with the social enterprise is a win-win. Ability Works can continue the great work in creating employment opportunities for people facing barriers to employment, helping them to build their skills using machines, equipment and computers and the project team get the tools needed to build the job, knowing they are helping to make a difference.

Aboriginal Partnership

The project team partnered with Geared Up Culcha to supply Personal Protective Equipment (PPE) to workers, including custom work boots on the Mordialloc Freeway project. The Zeke boot is manufactured by KingGee and is exclusively distributed by Geared Up Culcha.

The boots have a unique pattern on the soles, insoles and laces, which reflects the sacred Pilbara landscape in the north of Western Australia.

By partnering with this Aboriginal owned and controlled business, the project is supporting Geared Up Culcha to donate funds to both the Indigenous Literacy Foundation and the Yaru Foundation, which provides clean drinking water to remote Aboriginal communities in Australia.

Echuca	Moama	Bridge
Stage 3		

Client:	Transport for New South Wales & Major Road Projects Victoria		
Location:	Echuca, VIC & Moama,	NSW	
Contract:	Design & Construct		
Role:	Principal Contractor		
Dates:	Oct 2019 - Feb 2022	Value:	\$178M



Project Description

Echuca in Victoria and Moama in New South Wales are connected by a single Murray River Bridge that was first opened in 1878.

The Echuca Moama bridge project is jointly funded by the Australian, Victorian and New South Wales governments to build a new bridge to connect the Murray Valley Highway and Warren Street at Echuca with the Cobb Highway at Perricoota Road in Moama.

The scope of works includes:

- a new road north of the new Warren Street roundabout in Echuca with one lane in each direction
- new bridges over the Campaspe and Murray rivers
- two new flood relief bridges
- a new separated walking and cycling path, providing a safe and scenic link between Echuca and Moama via Warren Street.

Innovations

The project team mobilised to site just prior to Covid-19 restrictions coming into force. A number of distancing measures have taken place.

Social distancing measures include toolbox talks and briefings. Due to current restrictions, our 'Welcome to Country' plans were pared back today, however with representatives from traditional owners, *Yorta Yorta, the Project acknowledged their deep and spiritual connection to the land and waterways such as the Murray River.

A small group gathered on the Sandhill, a culturally important Yorta Yorta site elevated above the surrounding floodplain, within the project's footprint.

The Yorta Yorta are the Aboriginal traditional owners of a region across north-central VIC and southern NSW, including Echuca and Moama. The group included some of the MCD and MRPV Project team plus members of the Yorta Yorta community working on the Project.



Webb Dock MaritimeWorks



Project Description

The Port Capacity Project was a \$1.6 billion upgrade that included the redevelopment of Webb Dock to create a third international container handling facility alongside the development of a dedicated facility servicing Victoria's automotive import-export trade.

McConnell Dowell was the Principal Contractor delivering the Maritime Works Package of the Port Capacity Project. The Package comprised the design and construction of improved waterside infrastructure, including upgraded navigation aids and berth facilities.

The project demonstrated McConnell Dowell's capabilities to resource and deliver a complex design and construct project, which was demonstrated by the following project facts:

- 900 tubular steel piles up to 1500mm diameter and 45m long driven as single length piles
- 40,000m³ of structural concrete
- 10,000 tonnes of reinforcing steel
- 40,000m of sheet pile installation
- 210,000 tonnes of imported quarry product
- 15,000m³ of rehabilitated concrete deck
- The removal of 2.3 million m³ of dredge material.

The project was delivered within an operational port environment concurrently with four adjacent major construction contracts associated with the Port Capacity Project.

Client:	Port of Melbourne Corporation (POM)			
Location:	Melbourne, VIC			
Contract:	Design & Construct			
Role:	Principal Contractor			
Dates:	Jan 2014 - Dec 2016	Value:	\$400M	

Innovations

The PCP Maritime Works Package demonstrates McConnell's ability to design, resource, and deliver complex marine infrastructure in a live operational port environment. We worked closely with the POM, its tenants and four adjacent PCP contractors to plan and execute our works with no unplanned disruption to operations. Our Project Director regularly presented at a Project Liaison Group (PLG) forum, alongside our dedicated Stakeholder Manager, providing construction updates and look ahead details to key project stakeholders, the local community and the POM operations teams.

McConnell Dowell introduced the use of robotic hydrodemolition for breaking back pre-cast piles in confined spaces. This provided safety benefits by eliminating the need for workers to enter confined spaces.

McConnell Dowell designed and purpose built multiple access platforms for safe working over water. These frames were also designed as multi use and were also used to install multiple heavy pre-cast beams along the berth alignment. McConnell Dowell's Engineering Team developed cantilevering platforms that sat on the wharf edge and moved along the wharf without the need for cranes or other plant. They are a cost-effective solution for repetitive work that minimises working at heights risks and provides safe access to the works.

2017 Australian Construction Achievement Award winner.

Re	genc	y	Road
to	Pym	S	treet

Client:	Department of Planning, Transport and Infrastructure, SA		
Location:	Adelaide, SA		
Contract:	Alliance		
Role:	Non-owner participant and Principal Contractor		
Dates:	Jul 2019 - Jan 2022	Value:	\$189.8M



Project Summary

The project comprises an at-grade motorway from the existing motorway infrastructure to the north (South Road Superway); an overpass of the motorway over Regency Road; and an at-grade motorway from Regency Road to Pym Street, transitioning to the lowered motorway infrastructure (Torrens Road to River Torrens Project). The concept design includes:

- A 1.8 kilometre section of non-stop roadway, providing three lanes in each direction (at-grade).
- Two lanes in each direction on the South Road surface road, providing access to the surrounding community and local businesses.
- An overpass over Regency Road (three lanes in each direction). Two lanes in each direction (at-grade) on the surface roads underneath.
- Left in and left out only access at Pym Street.
- Full access to and from the non-stop motorway at Regency Road.
- Intersection upgrade at Regency Road.
- Improved cycling and pedestrian facilities.
- A grade separated pedestrian and cycle overpass over South Road in the vicinity of Pym Street.
- Landscaping and noise barriers.

Innovations

a) Use of a web-based Comment Integration Tool

 b) Assembly of the Regency Road Bridge main span in an off-line assembly location and moving the bridge into position using Self Propelled Modular Trailer (SPMT):

- Pre-assembly of the 65m main span (in two halves) in an assembly yard approximately 500m from Regency Road including installation of the steel box girders, pre-cast concrete deck units, cast in-situ concrete deck and edge barriers
- During a closure of Regency Road and partial closure of South Road, the bridge will be moved position using SPMTs with each bridge half will weight nominally 1,300t followed by completion works
- Minimised disruption to traffic and a much safer environment for construction of the bridge
- c) Traffic Management:
- The North South Corridor is the primary transport route through Adelaide and diverting traffic off the road would cause significant disruption to traffic on other routes and likely cause grid-lock locally to the project
- The R2P Alliance adopted an approach to "encourage" traffic to continue to use corridor whilst construction works proceeded
- Non-critical turning movements were banned, which created additional green time for through movements
- Key Performance Indicators were agreed with the Road Authority which allowed the Alliance to measure performance
- Daily review of traffic and weekly dashboards are issued to review traffic volumes and ensure that all possibly opportunity is provided to keep traffic moving through the project and minimise diversion of traffic to other routes.

Western Program Alliance (VIC), Level Crossing Removal Projects



Project Summary

McConnell Dowell is the principal constructor for the Western Program Alliance (WPA), established to remove level crossings and other rail-related works predominantly in Melbourne's west. Established in 2017, to date they have successfully completed the removal of the:

- Kororoit Creek Road, Williamstown North level crossing and duplicated a section of the Altona Loop
- Abbotts Road level crossing in Dandenong South
- · Aviation Road, Laverton level crossing removal project.

The team also constructed the new Wyndham Vale Stabling Yard for V/Line.

In 2020 four additional packages of works were awarded:

- 3 Level crossing removals on the Werribee Line at Old Geelong Road in Hoppers Crossing, Cherry Street in Werribee and Werribee Street in Werribee
- Cranbourne Line Upgrade works including track duplication between Dandenong and Lynbrook, Greens Road level crossing removal, and new rail bridges over Eumemmerring Creek and Abbotts Road. Designs were developed in conjunction with community input and approved for construction in January 2020.

Building on the previous State Government commitment to initially remove 50 dangerous and congested level crossings across Melbourne, this was increased to 75 after the State Election in late 2018. This new milestone will see the entire program complete by 2025.

Client:	Port of Melbourne Corporation (POM)		
Location:	VIC		
Contract:	Alliance		
Role:	Non-owner participant and Principal Contractor		
Dates:	May 2017 - 2023 Value: \$862M		

Innovations and Value Add

Visual Management Centres (VMC): McConnell Dowell implemented a VMC process across three levels throughout the Alliance, this process replaces traditional inefficient and less effective reporting and escalation processes with the aim to eliminate the waste of poor communication.

Connected Sites Pilot Program: The Connect Site Project (CSP) is a collaboration between McConnell Dowell, WPA, LXRP and global technology company Orange. Initially being trailed on the Aviation Road site involves placing sensors on machines and around the site to capture data to ensure more richer information can be captured live, on-the-ground, to help the project make informed decisions and report on progress as well as capturing gained efficiencies. This live, real-time data allows the Alliance to improve efficiencies and realise cost and time savings.

Contaminated material management and reuse:

At Kororoit Creek Road it was identified early that the soil and groundwater on site was contaminated with low concentrations of Polyfluoroalkyl Substances (PFAS). The team at WPA engaged early with the regulator and successfully gained approval for the reuse of PFAS impacted material onsite, which was a Victorian first. McConnell Dowell has taken these lessons learnt and delivered discussion papers to the broader LXRP program alliances to assist the industry in managing PFAS-impacted material. This continual feedback loop of lessons learnt being provided to follow on projects is a key outcome that will be adopted these works.

Tennant Creek NT to	o QLD (481kr	n)
ECI & Construct onl	У	
Principal Contracto	r	
2015 - Sep 2018	Value	\$157M
	Tennant Creek NT to ECI & Construct onl Principal Contracto 2015 - Sep 2018	Tennant Creek NT to QLD (481kr ECI & Construct only Principal Contractor 2015 - Sep 2018 Value

Northern Gas Pipeline



Project Description

McConnell Dowell was engaged by Jemena under an exclusive ECI agreement to partner in the NT Government's competitive process to select a proponent to build and operate the North-East Gas Interconnector Pipeline. The scope involves the construction of approximately 481km of 12-inch diameter high pressure gas transmission pipeline and associated pipeline facilities including two mainline valves and a midline scraper station. The pipeline transports gas from existing offshore and onshore gas reserves in the Northern Territory and supplies this gas to Incitec Pivot's Phosphate Hill plant located south of Mt Isa and other users.

The Northern Gas Pipeline Project was constructed in very remote arid lands roughly stretching between Tennant Creek and east to the Queensland border lands.

Innovations

Some of the challenges faced on the project include: • A scarcity of water available for construction activities

- Very high dust levels due to low subsoil moisture conditions and water scarcity
- Extremely high daytime temperatures for some months of the scheduled construction activities
- A variety of land owners including large industrial pastoral companies, private pastoralists, Crown lands and indigenous landowner groups
- Summer wet season necessitating a break in construction activity.

The construction of Northern Gas Pipeline project set new benchmarks in pipeline safety performance with:

- More than 550,000 manhours and more than 280 days of physical construction activity with a Total Recordable Frequency Rate of zero and no Medical Treatment or Lost Time Injuries
- The site is spread across 481km and the project team completed more than 5,600,000 kilometres driven on the project (excluding third party transport) with no significant vehicle incidents, collisions of any kind or adverse involvement with vehicles driven by others (general public)
- More than 53,000 pipe joint movements with no dropped pipe.
- Innovations & Technology
- Food dehydrators in construction camp to process waste, reducing transport and eliminating waste
- Computerised radiography for welds with a wide range of cost, quality and time benefits
- Localised remote location cell phone coverage
- CAT Vision Tracking system for equipment including physical location, idle hours, operating hours and fuel burn
- HELIX In Vehicle Monitoring System used to monitor driver behaviour.

Amrun Export Facility



Project Description

The Export Facility is known as Chith, the Wik-Waya language name for the red and white eagle (Brahminy Kite) that visits and inhabits the area surrounding the Export Facility.

Constructed in just 12 months the bauxite export facility includes a 650m access jetty and a 350m wharf both fully provisioned with services, conveyors, roadways and access walkways.

The scope also included the onshore construction of 350 metres of ground conveyors and transfer stations works linking into the reclaim conveyor. McConnell Dowell self-performed much of the construction.

Client:	Rio Tinto (Bechtel EPC))	
Location:	Cape York Peninsula, Far North Queensland		
Contract:	Alliance		
Role:	Principal Contractor		
Dates:	May 2016 - Feb 2018	Value: \$170M	

Innovations

The Amrun Export Faculty was a collaborative, construct only contract working closely with the client Rio Tinto, EPC contractor Bechtel and the engineering consultant Jacobs. There was a six month dual ECI phase prior to award which enabled all parties to drive value adds and clarify the contract requirements. Innovations developed in this phase were market leading with significant project benefits realised.

The second phase involved design completion, procurement and preparation for site works. McConnell Dowell engaged with a selection of our Chinese partners to prefabricate all the major components in Shanghai. The China fabrication was championed by a combined team of project, McConnell Dowell China and fabricator personnel.

The final phase was site construction works. The construction was integrated into the overall project development with key elements supplied by the client. Cooperative working relationships, pre-planning and a commitment to a best for project philosophy was the cornerstone of the success of the project.

The project won the 2019 Australian Constructors Achievement Award, 2018 Civil Contractors Federation (CCF) winner National Earth Award for projects valued over \$75 million, 2018 "Best Contractor" in Rio Tinto's Chief Executive Safety Awards, 2018 QMCA Innovation Award and the 2019 Institution of Civil Engineers Brunel Medal.

Client:	New Zealand Transport Agency		
Location:	Auckland, New Zealand		
Contract:	Design, Build, Operate and Maintain		
Role:	Alliance - Fletcher, Obayashi, Beca, Parsons Brinckerhoff and Tonkin & Taylor, McConnell Dowell		
Dates:	Aug 2011 - Jul 2017 Value: \$1.54B		

Waterview Connection



Project Description

The Waterview Connection was the largest project in Auckland's Western Wing Route, one of New Zealand's Roads of National Significance and involved the design and construction of 4.8km new motorway from the end of the SH20 motorway at Maioro Street through to a motorway to motorway interchange with SH16 at Waterview. 2.4km of the new motorway incorporated two 3-lane tunnels, 13.1m internal diameter, which were constructed by a purpose built earth pressure balanced tunnel boring machine.

Key components of the Waterview Connection project included:

- A full diamond interchange at Maioro Street
- A 4.5km motorway connection from Maioro Street Interchange to SH16 at Great North Road Interchange
- Twin 3-lane tunnels 2.4km long from Alan Wood Reserve to Waterview Park
- A southern tunnel portal structure incorporating ventilation building and vent stack
- A northern tunnel portal structure incorporating ventilation building
- A ventilation duct crossing Great North Road to a remote vent stack
- A new bridge carrying Richardson Road over SH20
- A new bridge carrying SH20 across Oakley Creek

- A pedestrian and cycle bridge over SH20 in Hendon Park
- Four 2-lane motorway-to-motorway connection viaduct structures

Innovations

During the design phase the Alliance established a value-for-money (VfM) team comprising experienced design, construction, and client personnel (including Aurecon staff).

This resulted in some the use of key innovations such as:

- Using the pits required for the tunnel-boring machine (TBM) launch and turn-around as the permanent drainage sump at the tunnel portals providing saving of \$1.6m
- Optimising the steel segments and reinforcement in the tunnel segmental lining to reduce the amount of steel required - resulting in savings of \$2.7m
- McConnell Dowell coordinated drainage design and construction which allowed removal of cement stabilisation from the tunnel backfill specification while providing a trafficable surface adequate for heavy haulage and relocating tunnel main drain from invert culvert to backfill, resulting in savings of \$1.7m.



For over 50 years customers have been coming to us with complex projects that require innovative solutions.

Riverbank Pedestrian Bridge





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