

# THE LIVERPOOL RAILWAY TURNBACK

**MAIN CONSTRUCTION COMPANY :** John Holland  
**CLIENT :** Transport for NSW  
**CONSTRUCTION VALUE :** \$160million  
**COMPLETION DATE :** January 2014  
**ARCHITECT :** Dawbin Architects Pty Ltd  
**SURVEYOR :** Cardno Hard & Forester Pty Ltd

The \$160M Liverpool Rail Turnback Project was designed to improve capacity and reliability on the Sydney Trains network, removing bottlenecks and junctions, reducing congestion and delays.

After three-and-a-half years overseeing the construction of the new Liverpool Turnback rail, Bill Hart of John Holland had a front row seat, so to speak, when the infrastructure “opened”. Hart was on the first train that pulled into the new platforms at Liverpool, in Sydney’s south west, at 4.50am on Monday January 13. He shared the commissioning ride with seven other John Holland executives. “It was good,” he said. “I was pleased to see all the management team were excited enough to turn up at 4.30 in the morning to catch a train. “The commissioning went exactly as we planned it. We couldn’t have done it better.”

John Holland was the managing contractor for Transport for NSW’s Liverpool Turnback Project. The project was unusually complex, although not huge in size, comprising 1800m of new rail track, stabling facilities, two sidings, a pedestrian concourse and a new fourth platform at Liverpool station.

The complexity was in the work site; most of it was alongside live trains and another line construction. “It was a very complex, live system that we could not disrupt,” Hart explains. “Southern Sydney freight line being built on one side of us with ARTC (Australian Rail Track Corporation) and the normal train system on the other side. We were in the middle of the two.”

To enable work to be done, parts of the Liverpool railway line were closed some weekends and for three weeks each January, the quietest commuter period. The January closure happened for four years in a row

and would see John Holland working up to 24 hours a day while commuters bypassed the railway line in buses. “It entailed a lot of people, a lot of planning, and working around the clock,” Hart says of the January period.

“On some activities we would have three shifts going; we tried to give the neighbours a respite between 2 and 6 in the morning, so if we were a bit noisy they could get some sleep. If they were very close we would offer alternative accommodation; some people took it up, some didn’t.”

“It was tighter than normal, but it’s normal for our field of work, working next to live systems. The Cronulla duplication was similar but not as tight as this. We came here with our eyes open and we geared up for it.”

Meticulous planning and advanced procurement made sure materials arrived on time so no working time was wasted. “It was very tight project management. The planning for January would start in February after one lot had finished. You would start a long way out what you needed to do, what you needed to get.”

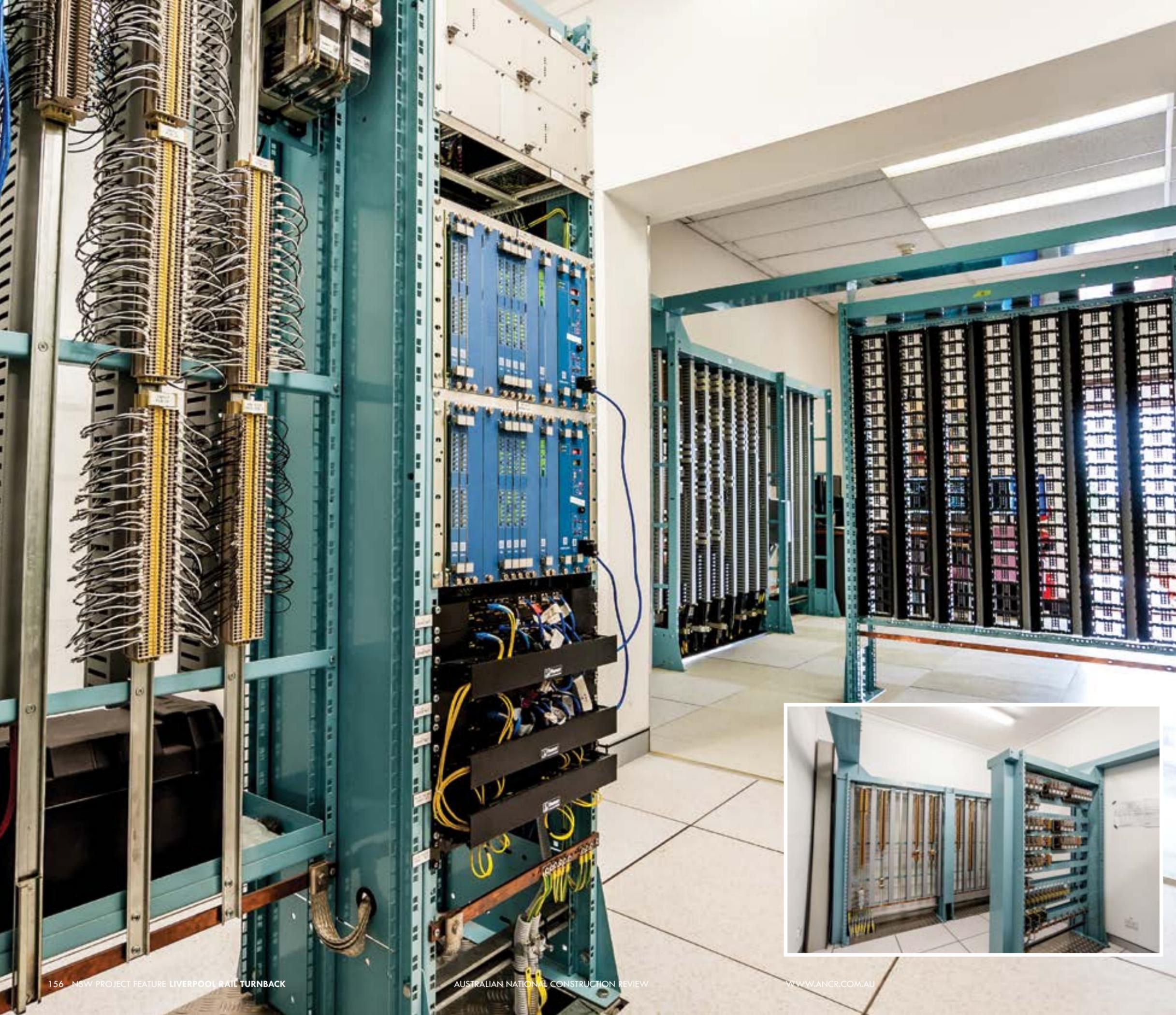
John Holland also did all the major earth works, extensive draining, and constructed a new viaduct for the trains to go across at Liverpool. A lot of in-house expertise was used for areas including signaling, trackwork and overhead wiring; while major subcontractors worked on concrete, structural steel, panels, labour and building. Over nearly four years, John Holland inducted around 2500 people on site to maintain a safe environment.



John Holland is also finishing work on a south west Sydney line, the Glenfield to Leppington job, which is about 11km.

For more than 65 years John Holland has been delivering contracting, engineering and services solutions to the infrastructure, energy and resources, and transport services sector across Australia, New Zealand, South-East Asia, and the Middle East.

*For more information contact John Holland, Level 3, 65 Pirrama Road, Pyrmont NSW, phone 02 9552 4288, [www.johnholland.com.au](http://www.johnholland.com.au)*



## PRECISION ENGINEERING

Milspec Manufacturing Pty Ltd specialises in the manufacture of outdoor enclosures and frame works and is a major provider to the rail industry across NSW, Victoria and South Australia. The company provided the signal equipment racking for the Liverpool Rail Turnback project.

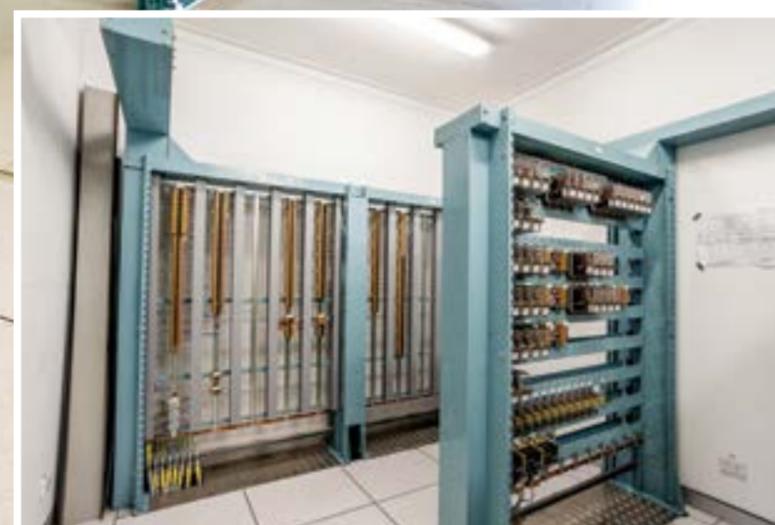
Milspec Manufacturing is an Australian owned company situated in Albury, on the border of NSW and Victoria. The company has been in business for about 12 years and during that time, it has grown from a small family business, to a professional, globally competitive organisation in niche and precision engineering.

The company, which achieved a top 3 position in the University of Newcastle's Business Achievement Award this year, employs 70 staff, including experienced mechanical and electronic engineers. Scott Gardiner (design engineer) worked closely with Ian Graham of John Holland Group to provide a completely customised racking solution for the Liverpool Rail Turnback project. The design considerations were cost, ease of installation and a desire to be modular. "It is this last point where John Holland Group really appreciated Milspec's expertise," said Neil Morrison, the General Manager.

Milspec Manufacturing's core markets are defence and rail. "The high demand of the defence world transfers across to our rail sector products in terms of quality, repeatability and technical competence," said Neil Morrison. "Today Milspec is moving into more populated enclosures, offering builders and service contract providers a one stop shop ... (our) manufacturing plant allows our customer the confidence of knowing the enclosure is 100% in-house manufactured."

Milspec Manufacturing's motto, "the pursuit of excellence comes second to none" is something the company takes seriously. The Liverpool Rail Turnback project is just one example of Milspec Manufacturing's successful pursuit of excellence.

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## THINKING OUTSIDE THE SQUARE

**IM Engineering Australia Pty Ltd** is a privately owned, award winning Newcastle engineering company. IM Engineering provided the structural steel package for the platforms, viaduct and two pedestrian bridges for the Liverpool Rail Turnback project.

IM Engineering has been in business for 38 years. The company's services include project management, building construction and specialist engineering services. The specialist engineering services include structural steel/aluminium/stainless steel fabrication, prefabrication, mechanical installation, pressure welding, water treatment – UV stabilisation, hydrogen plant service and reconditioning, unrestricted demolition, asbestos removal, roofing and cladding, metal preparation / sandblasting, and industrial maintenance and painting. IM Engineering also has a range of cranes that are available for hire.

Viktor Nikolas (General Manager), Dragan Ilic (Senior Estimator/Senior Engineer), and Alex Datcu led the professional team that worked on the Liverpool Rail Turnback project. Their focus was on client needs, innovation and teamwork. The unique part of the Liverpool Rail Turnback project was to change the design of the 52 ton enclosed pedestrian (walkway) bridge so that it could be fabricated and assembled within IM Engineering's workshop at Kooragang Island, Newcastle. The bridge was transported assembled and complete, to Liverpool Station. IM Engineering then successfully met the challenge of lifting the 52 ton bridge into position with a 450 ton mega lift crane. This innovative solution from IM Engineering allowed the bridge to be constructed without needing to stop during inclement weather. The advantages, to the client of IM Engineering's approach, were that the pedestrian bridge was in place, ahead of time and within budget.

IM Engineering has completed many successful projects for companies such as Macquarie Generation, Delta Energy, State Rail Authority, Rail Corp, RTA, Capral, Western Pacific, Transfield, John Holland, PWCS, Moly-Corp, NSW Department of Commerce, Downer and many other organisations. IM Engineering's recent projects include the Stockton Ferry Wharf and the Liddell Hydrogen Plant Rebuild project. An example of a successful project, where IM Engineering used cutting edge UV technology is Tanilba Bay Waste Water Sewerage Treatment Works, where the processed water outlet was next to oyster leases.

IM Engineering takes pride in the service and support the company provides its clients, as well as, "thinking outside the square", its focus on sustainable development and being "an industry leader in innovation".

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## EXPERIENCE IN EXCAVATING

Terra Civil Pty Ltd is celebrating their 10 years of operation this year, specialising in civil construction, earthworks, plant hire and haulage. For the Liverpool Turnback project they provided plant hire as well as excavation and earthworks expertise. All 20 employees worked on the project including plant operators, supervisors and truck drivers. The work included re-compacting, trimming batters, excavating for drainage, detailing of earthworks and final trim works, removing asbestos and over 20,000 tonnes of material off site. The company was also involved in track reconditioning and shut downs and brought a large amount of new ballast back onto the site.

“Terra Civil’s extensive experience coupled with a full range of excavation equipment can tackle the most diverse excavation projects, which range from domestic through to commercial/industrial projects,” says a company spokesperson. “All the work which we undertake is completed with thorough attention to detail.” Terra Civil met the two biggest challenges on the project which were the tight restricted work space in which machines were to operate and the fact that trains were running in most instances by planning and careful consideration of how every task was to be executed.

The closer the project got to completion the more restricted the work space became. At all times health and safety were of the highest standard. “John Holland’s Liverpool Turnback Team were incomparable to work with,” said a company spokesperson. “They were impeccably organised and communicated with our team at every level on every task. It was a pleasure to work with them.”

Terra Civil’s completed a wide range of projects which include Holsworthy Shopping Centre (removal of existing vegetation and redundant services, bulk excavation, earthworks), Canley Vale Shopping Complex (bulk and detailed excavation 8 metres deep) and civil works on various road projects. Terra Civil’s haulage operation transports over 300,000 tonnes of material a year and is well positioned to undertake any project in this area. Terra Civil’s company motto is “quality, experience, solutions.”

*For more information contact Terra Civil Pty Ltd, PO Box 53, Austral, NSW 2179, phone 02 9606 6629, fax 02 9606 6093, email enquiries@terracyvil.com.au, www.terracyvil.com.au*



## WINNING WAEGER

Waeger Constructions Pty Ltd specialises in bridge design and construction and the manufacture of precast concrete products. The company supplied the precast concrete requirements for the Liverpool Turnback Project. This included precast concrete platform units and precast concrete stairs for the new platform, precast prestressed beams for the concourse extension and precast prestressed beams for the viaduct.

Waeger Constructions has been in operation since 1987 and has 28 experienced staff. The Liverpool Turnback project was carried out by its precasting division, which specialises in custom pre-casting, limited run and made to order products from seats to large prestressed structural beams.

“The project was really suited to our company due to the variety of precast concrete product required to be supplied,” said Managing director, Michael Waeger. “We were able to demonstrate the wide range of precast that our company can do.”

Waeger Constructions is currently working on a variety of precast supply projects in NSW, including ramps and stairs for the Bullabarra East Upgrade project in the Blue Mountains and noise wall, bridge parapet and fascia panels for West Gosford Interchange project. Some of the company’s current Sydney projects include the supply of precast headstocks for the Pier 26 Upgrade project at Darling Harbour and the precast retaining walls, which include a patterned finish, for the City of Sydney Council’s Glebe Foreshore Project.

*For more information contact Waeger Constructions Pty Ltd, 17 Shipley Drive Rutherford NSW 2320, phone 02 4932 4900, mobile 0402 448 647, email wcpl@waeger.com.au, www.waeger.com.au*

# SOLUTIONS DRIVEN TO DELIVER AHEAD OF TIME

Zoomwave Constructions specialise in civil concrete construction, focusing primarily on roads, bridges, tunnels and railway projects. Founded in 1992 by Tommy Rice, Zoomwave Constructions has been a trusted sub-contractor of civil formwork and concrete construction on some of Sydney's largest infrastructure projects for over 20 years.

"Zoomwave has gained an enviable reputation as a solutions driven sub-contractor and leaders in strategic planning for major civil constructions," said Menh Lam, Commercial Manager at Zoomwave Constructions.

Recently contracted to supply and construct Platform 4 and Deflection Walls for the Liverpool Rail Turnback project, Zoomwave Constructions employed a team of 30 skilled formworks, concreters and steel fixers led by Tony Henderson, Zoomwave Constructions Construction Manager. Well prepared for fast paced and high-

pressured environments, the job was delivered within the short timeframe and without any compromise on the quality of work.

"We are proud of our team's dedication to consistently deliver outstanding results on agreed project milestones," said Mr. Lam.

"We thank the John Holland team, in particular Bill Hart, Jeff Bolt and Jordan Rowe, for their continued support and confidence in Zoomwave Constructions. We are pleased to construct quality work for the Liverpool Rail Turnback project whilst delivering ahead of time."

*For more information on how Zoomwave Constructions can meet your sub-contractor requirements, contact Menh Lam on 0415 221 936 or email [menh@zoomwave.com.au](mailto:menh@zoomwave.com.au)*



## SERVICE, QUALITY AND PRICE

Metwest Engineering specialise in the design, supply and install of rail and infrastructure products across Australia. "If you can draw something to be made out of any type of steel, we can fabricate it," says Metwest Engineering Pty Ltd. The company began operations in 1987 as a structural fabrication company and produced products for use in the rail system of NSW and by infrastructure companies internationally. Since then Metwest Engineering has expanded into several different areas including precast concrete, galvanising and site installation services. Metwest Engineering holds ISO 14001, ISO 9001 and AS/NZS 4801 accreditation in WHS, Quality and Environment.

Metwest Engineering supplied and installed, to Railcorp and ARTC specifications, precast concrete pits, combined services route construction, overhead wiring structures, signal gantries, and specialist steel access solutions for the Liverpool Rail Turnback project. This was all completed in accordance with Railcorp and ARTC specifications.

All of Metwest Engineering's departments played a role on the Liverpool Rail Turnback project including their design and estimation department, steel fabrication team, concrete production team and site installation crews. Metwest Engineering designed CSR interface configurations (requiring development of new products), signal access ladders and

platforms to meet Railcorp clearance standards. Metwest Engineering also designed temporary stairs for site staff access. Metwest Engineering's experience and innovative approach led to the development of precast concrete cable transition chambers to overcome issues of confined cable routes on site. All of their designs were generated using 3D modelling software. Metwest Engineering's design objectives were to produce a complete design which required little or no revision and with short turnaround time to meet onsite work constraints.

Metwest Engineering are currently undertaking a variety of rail projects including the Epping to Thornleigh third track, the Glenfield to Leppington rail link, the North Strathfield rail underpass, the Lidcombe to Granville corridor upgrade, the Clyde connection works, the Auburn Stabling project and the Digital Train Radio System project.

Metwest Engineering takes pride in the fact that all of their projects were completed on time and under budget. "Service, quality and price, treat yourself to all three," said a Metwest Engineering company spokesperson.

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## LIVERPOOL TURNBACK'S BRIGHT SPARKS

When Liverpool Turnback opens early next year, passengers can sit back and relax, for they are in good hands. Exectronics provided switchboards, transformers and other equipment for the 1.8 km of rail track and extra Liverpool platform with its usual high product standards and attention to detail. For nearly 25 years it has supplied Australia's railways, including almost every NSW project such as the City Underground and Airport lines, in addition to the national mining sector and international rail customers.

Founded in 1989 by Managing Director Richard Mychalewycz, after spending 20 years at Railcorp and utilising that knowledge when training the engineering staff at Exectronics, was an invaluable element in the company's success, General Manager Jez Millbank explained.

Exectronics is not simply a one stop supply and design company. It is also a valuable reference source.

"Having that additional background knowledge helps when project managers or signal engineers ring us needing fast solutions to a challenging problem. They may require custom equipment manufactured in a hurry, have a piece of antiquated equipment needing replacement or updating. Whatever the issue, they know they can ring our engineers and be given a solution. Even if we do not necessarily get an order at that stage, going the extra mile to assist our customers at all times, undoubtedly cements working relationships by establishing trust in our knowledge and experience."

On the Liverpool Turnback, Exectronics provided equipment for 11 "Location Cabinets", the equipment enclosures normally found adjacent to the rail track.

Thanks to the efforts of the hard working team, Exectronics consistently delivered ahead of the project supply schedule, when they built nearly a dozen each of the 415 and 120 volt switchboards and 30 transformers, which either step up or step down the supply voltage to each location.

The switchboards supply power to the track circuit, where different voltages are needed for signalling or ancillary power such as for lighting. Power for reticulation is sourced separately. All up the company supplied over 500 equipment items including power supplies, surge protection and other signalling equipment.

Most projects begin with a circuit diagram outlining the basic design specification requirements such as circuit breakers, relays or transformers. Exectronics then determine and design the correct layout and size for the respective switchboards.

"The nature of mass transit makes it a very specialised and stressful sector. The safety and lives of large numbers of people are at stake. It is a pressurised environment. We are not supplying jellybeans."

For more information contact Exectronics, PO Box 92, Strawberry Hills, NSW 2010, phone 02 9557 1600, fax 02 9557 1066, website: [www.exectronics.com.au](http://www.exectronics.com.au)