

AWARD-WINNING TALENTS RESOLVE CHALLENGES OF EVERY KIND

MAIN CONSTRUCTION COMPANY : Kingston
PROJECT END VALUE : \$30 million
COMPLETION : February 2014



The \$30M Midal Cable Facility will produce cable for power transmission and distribution usage and process up to a maximum of 50,000 tonnes of aluminium per annum using the latest equipment & technology.

Ingenuity and complete dedication on the part of Kingston Building Australia (KBA) and their team delivered the Midal Cable Facility six weeks ahead of schedule, despite a range of quite unusual challenges. The project comprised the construction of two factories, each approximately 150m long by 45m wide, to house a rod and cable manufacturing plant.

Building one is a casting building which includes holding and tilting furnaces, a casting line, an adjacent crane room, leaking ladle containment area and water processing plant. Building two contains wire drawing and stranding machines, a laboratory and die shop as well as the administration offices for the entire facility.

The scope also included ancillary structures, namely, Administration areas, a haul road linking the new plant to the existing Tomago Aluminium facility, a crane room, a 250kL water re-use tank and car parking, on an approximately 5ha site at Tomago NSW. The early works also included demolition of the existing buildings on the site.

The project's biggest complication was the need to undertake substantial amounts of excavation and construction to 6m below ground level on a site where the water table was only 1m below the surface.

"There was an extraordinary amount of work required to de-water the excavations to allow the construction of concrete structure and in-ground services," said Kingston Building Operations Manager, John Tonkin.

"Depending on the location across the site there was up to 2.5 million litres of groundwater being pumped out of the site on a daily basis."

As part of the project's environmental management plan, this water was pumped into a combination of purpose built dams and allowed to re-infiltrate the Tomago sand flats ground water, resulting in 100 per cent recycling of millions of litres of water.

Other sustainability initiatives included protecting the endangered New Holland mouse which was identified on site. The mice had to be carefully captured, relocated to a new habitat and a protection zone installed to prevent them re-accessing the site.

KBA also separated concrete surplus on site, crushing it and sending it to recyclers, and overall achieved a 90% recycle rate for all materials.

By working closely with the Project Manager Carverstock Group as well as with the design team, Kingston were able to provide value-engineering to the project, and suggest design modifications which improved buildability, made the program more efficient and ensured the client-supplied electrical systems (designed outside Australia) were adjusted to meet Australian standards.

"Kingston added value to the design of the in-ground elements by co-ordinating with Carverstock Group and the structural engineer to modify a series of blade walls and steps which sped up the installation and reduced the cost of construction," said John.

"Additionally in order to alleviate problems with the water table in relation to the installation of foundations the design was modified to allow the use of screw piles to support the structure in lieu of conventionally bored piers

"In order to make up time on the project the 2nd building was constructed from a top-down methodology whereby the design was modified to allow the installation of the overhead steel & colourbond structure to be undertaken whilst the internal footings, pits and ground slabs were completed.

"KBA often joke that for this project all our best work is actually buried under the ground! The in ground concrete structure, which formed the pits required for the installation of furnaces, casting lines and wiring & stranding machines, was the most complicated series of foundations, blade walls and slabs imaginable. Additionally given that each pour was undertaken below the water table, then it was critical that KBA's inspection & test plans were stringently adhered to so as to ensure a quality product that would not leak."

Safety is something KBA take extremely seriously. Project specific innovations included design and implementation of a new handrail system for safety around constructed pits, and backfilling of finished trenches with blue metal to prevent injury to workers. The project's safety challenges also included managing multiple work faces across a large site with a variety of work activities occurring simultaneously.

The project was used as a yardstick by which KBA's overall WHS processes and procedures were reviewed and measured by the Australian Government Building & Construction OHS Accreditation Scheme, and subsequently, the company achieved Federal Safety Commissioner accreditation. During the course of the project further recognition of the commitment to safety was received in the form of the WorkCover Excellence in Work Health & Safety Award at the 2013 Master Builders Association Awards – the second successive year KBA has won the award.

"The site team has done a fantastic job in delivering the project safely and well ahead of time," said John.

KBA has around 50 staff including a skilled Project Management team who facilitate projects from the time, budget and resources perspectives. This includes identifying the most suitable subcontractors, and managing the works and program to achieve the end goal efficiently.

Other recent and current Kingston projects include Aldi stores at Singleton, Mayfield, Kotara, Cooks Hill, Port Macquarie, Wyoming and Kempsey; multiple projects at Williamstown RAAF Base and the Singleton Army Barracks project for Department of Defence; Industrial Design Workshops for the University of Newcastle; Lingard Private Hospital; Charlestown Medical Centre; Group Homes for Northcott Disability Services; The Vintage Rothbury Chateau Elan Day Spa & Villas; Lure Apartments at Port Stephens; DOCS Mayfield Commercial; BER projects; and MBA Commercial Centre Newcastle. In addition to their numerous New South Wales projects, KBA is expanding operations into New Zealand.

This extremely experienced company's approach to projects is founded on working as a team with clients to deliver their designs with minimal impact to the environment, zero harm to workers, and to a standard of quality which has been recognised with numerous awards both locally and nationally.

For more information contact Kingston Building Australia, 101 Munibung Rd, Cardiff NSW 2285, phone Mr Colin Robards 02 49271877, website www.kingstonbuilding.com.au



CONCRETE EXPERIENCE TRIUMPHS OVER CHALLENGING DESIGN

Extremely close teamwork was required between De Martin and Gasparini and SMS Civil to complete the concrete works package for the Midal Cable Facility, which included challenges such as placing and finishing a unique high performance concrete never used before in Australia, and an extremely high level of detail and precision in formwork and finishing.

DMG's scope included survey setout, detail excavation, concrete supply, concrete pumping, concrete place and finish, reinforcement supply and fix, formwork, and all jointing. In total, over 6,000m³ of concrete was supplied, placed and finished across the project's two buildings and external works. DMG also supplied and fixed over 500 tonne of reinforcement bar and over 17,000m² of reinforcement mesh.

Technical advice was provided for multiple aspects of the procurement and construction of concrete elements, including the sequencing of construction, and set-out for all trenches, set-downs, grout boxes and pits to meet the tight tolerances of the facility's imported prefabricated machinery.

DMG also assisted in the re-design and construction of the Crane Room facility, which required a Fondag Concrete mix in which the portland cement is replaced with calcium aluminate cement (Seca 51) imported from France. The crane room area required this mix so as to withstand the extreme temperatures of molten aluminium which are to be handled there.

"The Seca 51 mix had not been previously placed in Australia, and required DMG to trial and redevelop a placement method suitable to withstand 30 minute setting times, curing times of only 2hrs, and the handling of the high surface temperature whilst the hardening of concrete occurred. The product was placed and finished successfully and achieved strengths of up to 100mpa in 2 days," said DMG Project Engineer, Adam Campbell.

All concrete supplied across the project needed to be 40mpa strength or higher. Due to the majority of works being below the water table, Caltite Waterproofing Additive was dosed within the 40mpa concrete mix, and a double layer of Krystol hydrotite waterstop was supplied and installed to all construction joints to prevent the leaking and uplift of water within the buildings.

"The greatest challenge of the project was the physical ability to construct the highly complex design of the unique concrete structure, ensuring a high quality is achieved to meet the specification whilst constructing at a prompt pace to meet tight project completion target dates," said Adam.

Most areas on the project required the construction of multiple grout pockets of varying sizes, with protruding reinforcement to be left exposed after the stripping of formwork for future grouting of plant installation. These elements required pours to be at different real levels with numerous set-downs and galvanised cast-in elements constructed in each pour to suit the placement and installation of machinery, grates, mechanical, electrical and plumbing services.

"It was critical to the plant installation that each pocket and change in level occurred in its exact designed location," said Contract Administrator Cameron Anstis.

DMG had a management team of three on the project, Project Engineer Adam Campbell, Contract Administrator Cameron Anstis and Leading Hand Frank Mascera.

For more information contact De Martin and Gasparini (Newcastle), Phone Graziano Barbaro 02 97485120 (Sales Manager) or Adam Campbell 0466 153 255 (Project Engineer)

CIVIL EXPERTISE COMPLEMENTS CONCRETE CONSTRUCTION EXCELLENCE

SMS Civil's relationship with DMG began on the Ravensworth North Mine Upgrade project in 2012, where SMS was contracted to undertake construction of the heavy vehicle wash down bays.

The partnership was extremely successful, and led to the two companies tendering together on further projects including the Midal Cable Facility.

SMS Civil's scope of works on the Midal project was to supply, install and remove the formwork to buildings one and two, and for ancillary structures including the processed water tanks, minor substation, in addition to all external works. Their team also supplied skilled and safety-conscious labour for the placing and finishing of the concrete to Building 1, the retention tanks and all the external works, including hardstand areas.

An extremely high level of organisational ability was required on the part of SMS Civil's crew to meet the project's tight timeframes while working across construction tasks as numerous workfaces. Add to that the level of expertise required when working with high strength and fast-curing concretes, and you have a project which really gave the company a chance to shine.

Over 20 men were deployed to the project for 12 months, and due to the high level of safety awareness cultivated by DMG and SMS Civil, the project was completed LTI-free.

"This project was very successful for SMS Civil as we pride ourselves on taking on projects with an extremely high level of detail and difficulty," said an SMS Civil Spokesman.

"On this project we were able to show our capabilities and workmanship in full."

SMS Civil has grown from a locally based company specialising in multi storey commercial projects into a company with broad-ranging capabilities, which is providing complete construction packages for large civil projects across New South Wales including sub-stations, Dams, Railway upgrades and mining sector works.

Having built trust and teamwork with Ravensworth and Midal Cable Facility, DMG have teamed with SMS formwork to continue in offering a successful concrete structure package service using local labour and materials for Commercial and High Density residential projects, industrial and mining infrastructure as well as Civil projects within the Newcastle area.

DMG's management and knowledge in the concrete industry combined with SMS's technical skills will ensure that together they are well equipped for every project they undertake.

For more information contact SMS Civil Constructions P/L, PO Box 181 Warners Bay, NSW 2282, phone Shane 0432 116 612, email shane@smcivil.com.au, website www.smcivil.com.au



IN-HOUSE EXPERTISE DELIVERS THE FULL PACKAGE EFFECTIVELY



The Midal Cable facility offered almost every kind of engineering challenge - exactly the kind of project Bolte Civil thrives on. The company's scope included all the civil works, from geotechnical investigations and testing, survey setout and early enabling works through to bulk earthworks and detail excavations in watercharged ground, pavement works, stormwater drainage, detention tank construction, retaining walls, carparks, asphaltting, kerbing, and erosion and sediment works.

Because Bolte Civil's senior staff are predominantly qualified civil engineers, with substantial technical expertise, they were able to work closely with Kingston to develop solutions and then deliver them using their own manpower and plant.

"Our key approach is to provide the necessary and experienced resources specifically required for the project, as well as a strategic engineering style and analytical approach to prepare and plan all construction works and to review all aspects and risks of the works from design through to safety, environmental, and quality, providing better solutions or innovations where possible," said Bolte Civil Managing Director, Gavin Kimpton.

"For example, Bolte Civil reviewed and analysed the proposed design for Midal's detention tanks and offered an alternative design solution to the client which assisted in substantial cost savings, and reduced the detention tank procurement period."

Bolte Civil also enhanced the project's environmental management through measures such as using recyclable material wherever possible, including recycled crushed concrete DGB to subbase and basecourse flexible pavement areas in lieu of quarried natural rock DGB.

More than 20 of the company's staff and employees worked directly on the project, including Project Managers, Project Engineers, Senior Civil Site Supervisors (Managers), Surveyors, Concrete Structures Supervisor, Kerb and Gutter Crew Personnel, Concretors,

Formworker/Pit Builders, Plant operators, Pipelayers, and Civil Labourers. Plant owned by Bolte Civil used on the project included excavators, Positrack (Multi-Terrain Rubber Tracked loader), 12ton Padfoot Rollers, 12ton Smooth Drum Rollers, Grader, Watercarts, Cat 953 Traxcavator, plus Arrow Kerb & Gutter Extrusion Machine.

"Our ultimate aim is to ensure a safe, environmentally sustainable and high quality project is achieved in a timely and cost effective manner," said Gavin.

Bolte Civil holds a range of accreditations and prequalifications, including Quality Management Systems to ISO 9001:2008, Environmental Management Systems to ISO 14001:2004, Safety Management Systems to AS/NZS 4801:2001; prequalification for RMS, Hunter Water, Midcoast Water, local councils in the Hunter and Central Coast, and NSW Govt Services Technology & Administration.

The wide-ranging nature of the expertise and credentials Bolte Civil's people hold, including engineering, surveying, estimating, pipe-laying, plant operation, project management, concrete construction and environmental management enable them to undertake an extremely wide array of projects. These include bulk earthworks, road and highway pavement construction, sewer and watermain reticulation, stormwater drainage, gas and electrical reticulation, river/harbour seawall revetment works, schools, ovals, subdivisions, wetlands, sewer pump stations, industrial facilities and concrete construction works.



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