Concrete pole gantry for WA power station

Concrete armour defends island
Welcome to the latest issue of Rocla Works.

As a nationwide company, Rocla offers a range of engineered solutions as varied as the country we support. Our front cover this issue highlights one of the diverse applications for Rocla’s well regarded range of concrete poles.

Partially pre-stressed poles were supplied as gantry poles for the 132kV switchyard at the Western Energy gas turbine plant in WA. In fact, the variable environmental situations across WA make it an ideal location for Rocla® concrete poles, which are resistant to termites, rot and bushfire and in most environments have a serviceability life of 100 years. On the other side of the country in Victoria, Rocla® Concrete Poles are being used to bring power to rural almond orchards, again showcasing the diversity of customers we support.

We have introduced a new product to our range with the A-Jacks® Concrete Armour Units. Our story shows the use of A-Jacks® bundles to provide scour protection at one of the world’s largest coal loading facilities in Newcastle as part of their expansion to support our growing national resource sector.

Our precast concrete solutions continue to save time and therefore money on civil construction sites, including the use of precast culverts and headwalls on Adelaide’s major arterial road extensions and the use of a broad selection of pipeline precast components for an industrial subdivision in Brisbane.

Our water storage offer is highlighted in this issue with Plastream® tanks utilised in conjunction with the award-winning CDS® units for pre-treatment, helping to supply water to Western Australia’s livestock industry, while the RAAF in Queensland are using a purpose-designed concrete ecoHarvest™ system to meet their water sustainability plans.

Not only are Rocla® products diversified but so are the types of challenges faced by our customers, as shown in two of our stories, one about meeting traffic requirements while working on major arterials, and another about the different ways of dealing with stormwater under local conditions and environmental demands.

If you require further information on any of the products or solutions featured in this issue, contact us on our toll-free number 131 004 or email us at solutions@rocla.com.au or visit www.rocla.com.au.

Stephen T. Baker
General Manager

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Western Energy, a subsidiary of Perth Energy, is building a 120MW gas turbine power plant at Kwinana, south of Perth, fuelled by natural gas delivered through the Dampier to Bunbury pipeline.

The Kwinana Swift Power Station, with two 60MW gas turbines operating as an open cycle peaking station, is expected to result in lower environmental impacts than conventional power generating facilities.

The fast start-up time of the gas turbines makes them ideal for providing a back-up electricity supply and for supporting renewable energy generation such as wind farms.

The turnkey project was awarded to CTEC, a Perth-based global provider of energy and utilities solutions.

Areva T&D Australia, who supplied and installed the high voltage switchyard and auxiliary transformer/DC system, used Rocla® spun concrete power poles to construct four 132kV gantries in the switchyard.

Pairs of Rocla® poles (18m length, 44kN ultimate load) with steel cross-beams provided an economical alternative to steel truss gantries, which require extensive foundations. The concrete poles were simply and quickly installed by direct embedment, with concrete backfill.

Rocla manufactures high-strength poles from pre-stressed spun concrete for electricity transmission, as well as distribution poles from steel-reinforced spun concrete to suit a wide range of pole-top constructions, such as sub-stations and ABS applications.

Spun concrete poles are also ideal for a wide variety of other applications, including communications, CCTV, street lighting and floodlighting.

Concrete poles offer many strategic and technical advantages, such as durability, resistance to termites, corrosion and bushfires, and low whole-of-life costs.

For more information contact Rocla at Wodonga (02) 6024 7566 or Rockhampton (07) 4936 1233 or visit the Rocla website.
Concrete armour defends island against turbulence

Rocla A-Jacks® 275kg concrete armour units were recently deployed in an underwater installation at Kooragang Island, in the mouth of the Hunter River, to provide scour protection for new coal loading facilities.

Newcastle Coal Infrastructure Group (NCIG) is building a two-berth coal loading wharf on the southern side of Kooragang Island to expand the existing ship loading facilities at Newcastle.

Laing O’Rourke is constructing the wharf infrastructure, including land and marine piles, main wharf structure, shiploader support rails and maintenance access roads and walkways.

The southern arm of the Hunter River was also dredged to allow bulk coal carriers to be brought further upriver to the new loading facilities.

A-Jacks® units are concrete armour components engineered as two parts of equal geometry that fit together to form one complete unit.

The high stability A-Jacks® precast armour units are designed to interlock into a highly permeable matrix providing energy dissipation resulting in sediment deposition.

Rocla manufactured the 800 A-Jacks® units at its Emu Plains factory.

The A-Jacks® concrete armour half segments were delivered to site in palletised form. The units were laid out in lines and were assembled into single piece units by joining adjacent halves using approved Sika epoxy glue.

The construction specification called for individual units to be interlocked and installed in “bundles” of nine units.

In this case, three rows of three units were laid out on a steel sheet and a steel cable was tied around the “waist” of the bundle, locking the units into position.

A-Jacks® units welcomed in North Queensland

Rocla undertook a promotional visit to Northern Queensland in March to promote awareness of A-Jacks® precast concrete armour units. Presentations were delivered to representatives of local government, councils, consulting engineers and contractors in the coastal areas of Cairns, Townsville and Mackay.

All presentations were conducted by Frank Atkinson, Managing Director of A-Jacks Marine.

The use of A-Jacks® concrete armour in both coastal and river protection was discussed in detail and extensive footage was shown of successful revetment projects in the USA.

The river protection segment generated a significant amount of interest.

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Installing the A-Jacks® units in bundle form allowed nine units to be placed at one time and expedited installation in the murky water.

Laing O’Rourke installed the A-Jacks® bundles at the toe of the revetment, at depths of 12 to 18m, to protect the bank against scouring caused by turbulence from the ships’ propellers.

Conventional rock riprap was used on the batter but a ledge on the revetment was too steep to hold the rock securely.

Consulting engineers Aurecon specified the A-Jacks® units to stabilise the cutting.

A-Jacks® bundles were lifted and lowered into place on to the 100-metre long ledge using slings and mechanical crane.

Each bundle was installed using diver assistance because of the low visibility.

The high stability of A-Jacks® concrete armour is enhanced by the interlocking of the units into a flexible matrix.

The units can be installed either randomly or in a uniform pattern.

The interstices within the matrix can provide around 60% void space as a habitat for marine life when applied as a reef, revetment, or as a soil support system in river applications.

The arms of the units provided a solid foundation for the concrete armour and helped secure the riprap on the batter.
Rocla has been supplying a range of precast box culverts and headwalls for the Northern Expressway, a major road project designed to open up Adelaide’s north.

The 23km Northern Expressway, which links the Gawler Bypass with Port Wakefield Road, is being constructed by the Fulton Hogan York Joint Venture.

The $564 million expressway, the largest road construction project in Adelaide since the 1960s, is a joint initiative of the South Australian and Australian governments. The project includes a four-lane expressway, five interchanges, several bridges and a high-speed flyover interchange at Port Wakefield Road.

The four-lane freeway, expected to carry 37,000 trucks and cars a day by 2011, is designed to boost freight links from the Sturt Highway to Port Adelaide. Rocla supplied sub-contractor York Civil with hundreds of RCBCs (3000 x 2400) with link slabs (3000 span) for stormwater culverts, as well as more than 200 precast headwalls, all with special reinforcement and quality requirements.

The box culverts included a high proportion of special rail culverts (1200 x 600) designed and manufactured by Rocla to AS5100 300LA loadings, which allows the culverts to carry rail traffic with no fill or minimum cover.

They are being installed under an existing rail line to improve stormwater management.

enviss™ Sentinel wins environmental product award at CivEnEx

Rocla’s new stormwater treatment system, the enviss™ Sentinel filter pit, was recognised with an environmental award at the CivEnEx 2010 expo, held in Sydney during May.

The annual CivEnEx Construction & Public Works Expo has become a must-see event to discover new Australian technologies and products. The enviss™ Sentinel stormwater treatment system received a Highly Commended award in the Environmental Product category. Rocla’s Geoff Shadbolt and Martin Ryzak were on hand to receive the award and show off the product’s innovative features. The enviss™ Sentinel 600 is a unique stormwater treatment device that removes simple and complex contaminants such as nitrogen, phosphorous, metals and harmful bacteria. Designed and manufactured in Australia using natural and engineered media, the enviss™ Sentinel 600 excludes stormwater pollutants from entering stormwater systems on site. The simple, self-contained pits provide cost-effective design opportunities that complement Water Sensitive Urban Design principles.
Rocla® products are helping achieve water self-sufficiency for the huge Muchea Livestock Centre in Western Australia.

The $54.5 million Muchea Livestock Centre, located on a 300ha site north of Perth, is designed to service Western Australia’s regional and remote meat and livestock industry for the next 100 years.

The State Government facility, owned by the Western Australian Meat Industry Authority, can accommodate sales of up to 28,000 sheep and 3400 head of cattle a day.

With no local water supply, collecting and storing rainwater is an essential requirement for the Centre, which also features state-of-the-art environmental management and wastewater treatment.

Rocla Water Quality supplied a large Plastream® in-ground storage and detention system, as well as two CDS® Unit gross pollutant traps.

The 240kL Plastream® system provides potable water for the facility. Rainwater is collected from the 52,000 square metre roof of the livestock shed and stored in two Plastream® tanks, each 2250mm diameter and 34 metres long.

Two CDS® Units pre-treat stormwater for a storage dam

Captured water is purified using a UV system, pumped up to a tank on a hill, then gravity-fed to facilities, including offices and a canteen.

The tanks have almost 5m of cover, to bring them to the same invert as the stormwater system. Overflow from the tanks is discharged into a dam via the stormwater system.

Engineering design checks were undertaken by Rocla to confirm the suitability of the product for such a deep installation.

Installation of the detention system was carried out by Selected Plumbing. On-site welding of the pipe sections making up the tanks was undertaken by Innotech and the welds were spark tested after completion.

Plastream® tanks provided a cost-effective solution with minimal lead time compared to other products.

The CDS® Units (P1012 and P1512) specified by Pritchard Francis Consulting Engineers were installed by Marsh Civil.

Each unit has a 3000m² catchment area and are used to pre-treat stormwater runoff for the grey water dam, removing gross pollutants and hydrocarbons.

Rocla Water Quality was able to come up with a site-specific design to fit into the available footprint.

The muchea livestock centre aims at water self-sufficiency

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Rocla supplied 92 lengths of 1950mm Class 2 flush-joint RCP to Civil Contractors in January for a job in South-East Queensland that would normally take little more than two weeks.

Almost four months later, the final pipe section was laid. Installing 225 metres of concrete stormwater pipe is not usually a problem, even when the excavation is 5 metres deep. Unless it runs parallel to (and under) a busy road carrying 30,000 cars a day and also clashes with an existing water main.

The stormwater drain is part of the Parklands residential development by Kordan (Aust) at Raceview, south-west of Brisbane, and carries runoff from a natural watercourse, under busy South Station Road, to an outlet in Bundamba Creek.

Drivers complain that roadwork slows traffic to a crawl, but traffic also slows roadwork to a crawl.

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Scurry Plumbing took advantage of the broad range of Rocla® drainage products when installing the stormwater and sewerage infrastructure for a new industrial estate at Redland Bay, south of Brisbane.

Redlands Business Park is a master-planned business community in one of the high growth areas of the booming South-East.

Located on 43.7 hectares of bushland, the project will deliver more than 220,000m² of general industry land.

Scurry Plumbing recently completed the civil works for stages 1 and 2.

Rocla supplied a wide range of precast products, including pipe, circular and rectangular access pits, culverts and headwalls, sewer access systems with pre-benched bases, as well as kerb inlets and grates.

Stormwater drainage products included around 1.5km of Rocla® reinforced concrete pipe in diameters up to 1500mm, with 40 stormwater pit systems, including Rocla CPO® pits in 900 to 1500mm diameters and Rocla RKO® pits in various sizes from 600mm square to 900x900, plus 69 precast kerb inlet lintels and grates.

For the sewerage maintenance holes, Scurry Plumbing installed 48 Rocla sewer access systems with pre-benched bases and appropriate access chambers for depths of 1.2m to 6m.

Rocla® 2400mm box culverts feature at the entry of the business park, with various other sizes throughout the site.

Precast headwalls were also used throughout the site, ranging in sizes from 300mm to 1500mm.

Scurry Plumbing owner Bill Scurry said the time and labour saving advantages of precast drainage products made them an economical option on large projects.

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Heavy rain during construction had workers frequently “up to their armpits in water” but the ease of installation of the precast products helped make up for lost time.
RAAF targets rainwater reuse at Amberley base

Rocla® underground stormwater harvesting systems are helping the RAAF achieve self-sufficiency in non-potable water use during the redevelopment of its Amberley base in Queensland.

The latest Rocla® rainwater reuse system at the Amberley base, south-west of Brisbane, was installed by Caswell Civil to supply the new Fire and Security Training Facility, built by Broad Construction.

The 660kL ecoHarvest™ stormwater harvesting system includes a CDS® 0506 Unit gross pollutant trap to pre-filter rainwater collected from the roof of the new building.

The design flexibility of the Rocla® storage system allowed the tanks to fit the tight footprint, using a triple cell configuration on two sides of the building, linked by stormwater pipes. The trafficability of the Rocla® precast system also proved valuable, as the tanks had to be installed in sections and backfilled immediately to allow access for heavy construction vehicles as soon as compaction and fill heights were achieved.

The finished tanks were filled immediately to allow landscaping to progress, using the rainwater to irrigate the lawns and gardens.

The water will also be used for toilet flushing. The Rocla ecoHarvest™ system was specified by GHD Consulting.

Caswell Civil took advantage of the fast installation times provided by the Rocla® joint profile, which allowed the tanks to be placed as quickly as laying a pipe.

Rocla® concrete poles deliver irrigation power to almond farms

Rocla supplied 115 spun concrete power poles to Powercor to deliver a 1MVA three-phase electricity supply to almond orchards at Lake Cullulleraine in northern Victoria.

The project, a part of Regional Development Victoria’s power infrastructure program, involved new works as well as the upgrading of an existing line to connect the orchards to the Merbein sub-station, 59km from Lake Cullulleraine. Around 87 poles were used for the greenfields (SWER conversion) work on the new line, plus approximately 28 poles for the upgrade of an existing backbone line, used as inter-poles to carry heavier conductors.

Poles ranged in length from 11 to 15.5 metres and ultimate strengths of 16kN to 24kN. The new 22kV supply will deliver 415V three-phase power for irrigation pumps at almond orchards owned by Lake Cullulleraine Almonds, Golden Grain Flour Mill and The Grewal Family.

Powercor Australia operates the largest electricity distribution network in Victoria, supplying power to Melbourne’s west as well as Central and Western Victoria, including the major regional centres of Ballarat, Bendigo, Geelong and Mildura. Concrete poles are required by Powercor in certain parts of northern Victoria because they are more resilient to termite infestation than timber poles.

Rocla® concrete poles require no toxic chemicals to control termites or rot, resulting in minimal or no maintenance.

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Precast Boardwalk System

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WON’T rot, twist, splinter or warp

FREE of hazardous chemicals and fasteners

Termite-proof and will not BURN

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ZERO MAINTENANCE structure

The Rocla PermaTrak® precast boardwalk system is the eco-friendly alternative to timber boardwalks. Reinforced concrete components provide strength, design flexibility and a long, maintenance-free life. The modular system is easy to install and can be expanded or relocated at any time.

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