

BUILDING FOR THE 21ST CENTURY

Stage One of Global Switch's \$195 million world class Sydney East Data Centre comprises 24,000² of floor area and six storeys, offering power and cooling distribution.

CLIENT : Global Switch
BUILDER : Cockram Constructions
CONSTRUCTION VALUE : \$111 million
COMPLETION DATE : August 2014
CONSULTANTS : AREA3
ARCHITECTS : DEM



Cockram Construction (Cockram) and M+W Group formed a Joint Venture (known as M+WC) to construct Global Switch's Sydney East Data Centre under a Design, Development and Construction contract. The data centre offers high quality scalable data centre solutions with access to multiple carriers.

Global Switch is a leading large scale, data centre provider in Europe and the Asia-Pacific. The Sydney East Data Centre is located adjacent to Global Switch's Sydney West Data Centre in Ultimo and together they form the Global Switch Sydney campus.

Global Switch Sydney East Data Centre is a six-storey facility with a GFA of 12,000m² including 8,000m² technical space. The facility has a total electrical load of 21.375MW and includes controlled temperature areas.

When the project was announced in 2010, the former NSW Premier, Kristina Keneally, is reported to have said "Along with our rapidly growing information economy, demand for data centre space in Sydney is growing. This project will generate millions of dollars of new investment; increase data centre infrastructure capability, and reinforce Sydney's role as a global financial and IT hub."

The project is also a leading example of an environmentally sustainable data centre and will target a Leadership in Energy and Environmental Design (LEED) Gold Rating.

M+WC cultivated a collaborative and transparent relationship with the project stakeholders, which assisted strongly in fast tracking the highly technical design and construction process.

During the design phase, M+WC initiated and implemented design improvements to enhance constructability and boost cost benefits. They collaborated closely with the client, design team, subcontractors and suppliers in a number of workshops.

M+WC conquered a number of challenges during construction. Firstly, the building structure was located close to the Western Distributor Overpass, residential buildings, a rail corridor, and existing in-ground high voltage cables. Secondly, M+WC needed to avoid interfering with computer equipment in neighbouring

buildings, which required vibration mitigation during excavation. Thirdly, the detailed engineering works and sequencing for constructing the post-tensioned cantilever slab on Level 3 was particularly challenging.

Cockram is an Australian owned multidisciplinary construction services company. In operation since 1861, they are one of Australia's longest running construction companies. The heart of Cockram's business is the construction of thoughtfully designed, highly technical and innovative facilities within operating environments.

Cockram has over 300 staff in Australia, and projects in every Australian state. A company spokesman said "Our staff and systems are highly mobile ensuring the right project team with the appropriate skills is assembled for every project. Our company enjoys a very high staff retention rate, which is evidence confirming our reputation as a builder that cares about quality, professionalism, and its people."

Cockram has been involved in a number of significant Australian projects. For example, the \$80m+ Westmead Millennium Research Institute project located at Westmead Hospital and in late 2013, Cockram was also awarded the \$80m+ Australia Federal Police Forensic Facility in Majura, ACT.

M+W Group is a prominent global engineering and construction company, headquartered in Stuttgart (Germany), specialising in technology-based clients. Their core competency is in linking process and automation technologies, and complex facilities to integrated solutions. M+W Group primarily focuses on leading companies in the fields of electronics, photovoltaics, life science, chemicals, energy, automotive, security, IT & Telecoms, as well as research institutes and universities.

For more information contact Cockram Construction, Level 4, 41 McLaren Street, North Sydney NSW 2060, phone 02 8456 6500, contact Michael Read, email michael.read@cockram.com, website www.cockram.com

Below The team at AREA3 Consulting are extremely proud to see their huge project come to life.



From left to right: Charles Penny (Project Director) Charlotte Berry (Assistant Project Manager) and Richard Alder (Director – Superintendent).

“We have an energetic team who specialises in the efficient delivery of mission critical projects,” said Charles Penny for AREA3.

AREA3 is an Australian owned management consultancy. The company delivers project management services to a range of national and international clients, across the public and private sectors.

Darren Hawkins (Managing Director) and Charles Penny (Director), two internationally experienced senior consultants, established AREA3 Consulting Pty Ltd in 2009. They both shared the vision of providing a unique level of service and expertise to the project management industry.

“This determined focus to achieve excellence, and the hard-working attitude of the AREA3 team has allowed the company to continuously grow and expand; what was once a two man entity with an office in Melbourne is now a 20 strong team operating in Melbourne, Sydney, Auckland and Jakarta,” said Charles Penny.

“As a result of the solid foundation, expertise and core values appreciated by all AREA3 staff, we are able to continue to deliver outstanding results for our clients across the life cycle of their projects; from inception to completion.”

AREA3 is the Project Manager and Superintendent for the Global Switch Sydney East Data Centre project. The company was responsible for Design Management, Project Management, Construction Management and Superintendency. AREA3 managed the feasibility phase, the design stages, tendering, delivery, final commissioning, testing and finally, the handover.

The AREA3 Project Team that contributed to the success of this project consisted of Charles Penny (Project Director), Darren Hawkins (Project Feasibility phase), Richard Alder (Director - Superintendent), Franc Coles (Director – Mission Critical), Tom Kelly (Director – Development), Wayne Martin (Associate), Charlotte Berry and Anastasia Liem (Project Consultants).

AREA3 Consulting overcame numerous challenges in this project. “The project is delivering innovation in approach, not seen in other Australian Data Centres,” said Charles Penny.

“The mechanical and electrical systems are paramount to the overall functionality and user requirements.” Other challenges included; implementing a contract and procurement strategy that best suited the clients’ expectations and the user requirements, managing a large team of consultants, implementing project protocols that allowed for the flow of information between all parties (Client, Contactor, peer review team) and working to a very tight program.

AREA3 identified opportunities in the construction program and worked closely with the contractor in order to mitigate project risks. The project management team sought to look at the big picture at all times and take a proactive approach to the project rather than a reactive approach.

Some of the other projects that AREA3 has been working on include Global Switch Sydney West Fitout, ANZ Data Centres, Toyota, Yarra Trams DR Centre, Vodafone, Endeavour Energy and ANU in Canberra.

“AREA3 is proud to have been a part of this substantial, innovative and high quality project,” said Charles Penny.

“We are proud of our achievements, the effort of the team, including the designers, contractor, sub-contractors, in addition to the Global Switch project team itself. We all worked very hard over the past several years to realise this remarkable development.”

For more information contact Sydney Office - AREA3 Pty Ltd, Suite 3.01, 55 Miller Street, Pyrmont, Sydney NSW 2009, phone 1300 786 500 or Melbourne Office – AREA3 Pty Ltd, Level 5, 111 Collins Street, Melbourne VIC 3000, phone 1300 786 660, email info@area3consulting.com, website www.area3consulting.com



Left to right: Wayne Martin (Associate Project Manager) and Charles Penny (Project Director)



DEM (Aust) Pty Ltd was engaged by Global Switch to design their new Global Switch Sydney East Data Centre in Ultimo and to secure a Part 3A major project approval for the new facility.

DEM, established in 1961, is one of Australia's earliest multi-disciplinary design practices. The company's services for the project included urban design, master planning, architecture/landscape/interiors design and documentation services as well as statutory planning reports and advice.

DEM undertook the design development, BIM documentation and tender documentation. Global Switch's selected design and construct contractor, M+W Group/Cockram Construction, retained DEM to provide construction phase architecture/interiors/landscape design and documentation input during construction.

The DEM team for the Global Switch Sydney East Data Centre project comprises Rudi Valla (Project Director), Jon Pizey (Project Design Director), Simon Jenkins (Project Team Leader), Edmond Tang (Associate - Architectural & BIM Team Leader), Garry Slater (Interiors Team Leader), Alex Beeston (Landscape Team Leader) Phillip Waterman (Senior Project Architect), Meng Ng (BIM Architect), Peter Hadijsavas (Interior Architect) and Nanette Illing-Kelly (Project Standards Manager/Specification Writer).

Global Switch's aimed to represent their international operations in Australia with the provision of a high quality, sustainable and iconic building for Sydney. DEM's design adopts a unique machine-like aesthetic to reflect the highly technical functions of the building.

The design also aimed to obtain a LEED Gold Environmental Sustainable Design rating which is one of the highest international environmental rating achievable for a data centre.

"This high tech approach represents with honesty the various engineering equipment and environmental building design requirements", said Rudi Valla.

"Technical real estate buildings, unlike commercial offices, do not require glazing for penetration of natural light or views, as these buildings are not generally inhabited by people but are used for the storage of technical equipment. The Global Switch Sydney East project design provides an innovative and appropriate solution for the architecture typology of a technical real estate building, whilst physically and functionally accommodating the building's technical requirements."

The building is of steel frame construction with concrete floors, metal faced cladding and glazing. DEM chose the facade materials to reinforce the design concept of the building

as a machine. A large part of the facade is clad in satin finish silver metallic 'veils' which wrap up and over the rooftop plant. This innovative building encasement form will screen visually undesirable plant areas from elevated vantage points such as the high rise buildings which line the surrounding western CBD fringe and residential developments in Darling Harbour and Pyrmont. Perforated portions of the veils provide ventilation for the engineering equipment where required.

Whilst the technical areas of the building require no natural light or views, large areas of translucent coloured back glass have been used at the northern and southern ends of the building. Recessed vertical slots provide a contrast between the 'veils' on the eastern facade and add articulation and rhythm to the facade. A colonnade is formed towards the southern end of the building. The building entry is expressed by a large area of glass together with a glazed entry canopy.

"The machine aesthetic provides an architectural style, form and materiality for Global Switch Sydney East which provides a contrasting yet complimentary counter play to the existing Global Switch Sydney West Data Centre which was also designed by DEM," said Rudi Valla.

"The adopted architectural style for the new Global Switch Sydney East visually articulates the new and existing buildings as two separate structures although they physically attached at certain levels."

In addition to the work DEM has undertaken for Global Switch, the company has completed a number of Data Centres and mission critical projects for clients such as the Reserve Bank of Australia, Westpac, Telstra and Bank Negara Malaysia. DEM are currently the architects, interiors designers and landscape architects for the Metronode Modular Data Centre roll out across Australia.

For more information contact Rudi Valla DEM (Aust) Pty Ltd, Level 8, 15 Help Street, Chatswood NSW 2067, phone 02 8966 6152, mobile 0411 758 045, email rudi.valla@dem.com.au, website www.dem.com



Opposite Air Solutions implement new technology to ensure the safety of the data centre's servers.

“A leading source of innovative products and systems” is how Air Solutions International Pty Ltd describes itself, as a distributor in the heating, ventilating, air conditioning and refrigeration industry.

Air Solutions International Pty Ltd is located in Sydney. It commenced business in 1992 as a joint venture and became an entity in its own right in 1996. The company's activities involve representation to specifiers (consulting engineers, government departments), installing mechanical contractors, and building owners and developers.

“Air Solutions International Pty Ltd has the right mix of technical and business expertise to ensure the successful entry, into the Australian market, of products related to the air conditioning industry,” said a company spokesperson.

“We work closely with our overseas principals to enhance Air Solutions' product knowledge so that we can correctly apply the product and present the salient features to building owners, specifiers and architects. Most, if not all, these products have energy reduction capabilities that assist in reducing the energy consumption of the mechanical services of a building.”

Paul Sewell, Director Manager of Air Solutions International, worked on the Sydney Data Centre. With the company's partner, Carel Australia Pty Ltd, Air Solutions International approached M W Group to interest them in using the Carel optiMist adiabatic humidifier.

“As optiMist is a relatively new product on the Australian market we had to convince M W Group that it was a superior solution than what was specified,” said Paul Sewell.

“The optiMist is used to maintain the humidity in the building, which is critical for a data centre. It was extensively researched by Carel and field tested in Europe before being released to this market. Adiabatic humidification is also more efficient energy-wise compared to isothermal humidifiers using steam. The maintenance cost is very low, which is a big saving over the years of operation.”

The optiMist is a complete system that includes evaporative cooling and humidifying in a single solution, which can be used to treat the air in an AHU (air handling unit) to both humidify the (output air) SA (direct evaporative cooling) and to indirectly cool the renewal air (OA) in order to increase energy efficiency. It has the ability to modulate the water flow to ensure the correct amount of water is supplied to prevent over cooling so that no reheating of the SA is required.

Air Solutions is currently working on a variety of projects such as offices, hospitals, schools, sports facilities and military facilities. In recent times, the company has promoted a natural ventilation product called the Windcatcher from Mondraught UK with some success.

Air Solutions has a diverse range of products. These include Thermax absorption chillers, Powerpax centrifugal chillers, Carel humidification products (both isothermal and adiabatic), KE Fibertec textile duct systems, Heatex air to air heat exchangers, Climatemaster geothermal units, Sabiana fan coil units, CosaTron indoor air quality systems, Apreco air pressure control systems, SP Coils, Heatpipes, AET flexible space underfloor systems, Verdicorp Organic Rankine Cycle turbines, UVGI Ultraviolet Germicidal Irradiation Systems as well as some new technologies to be released soon

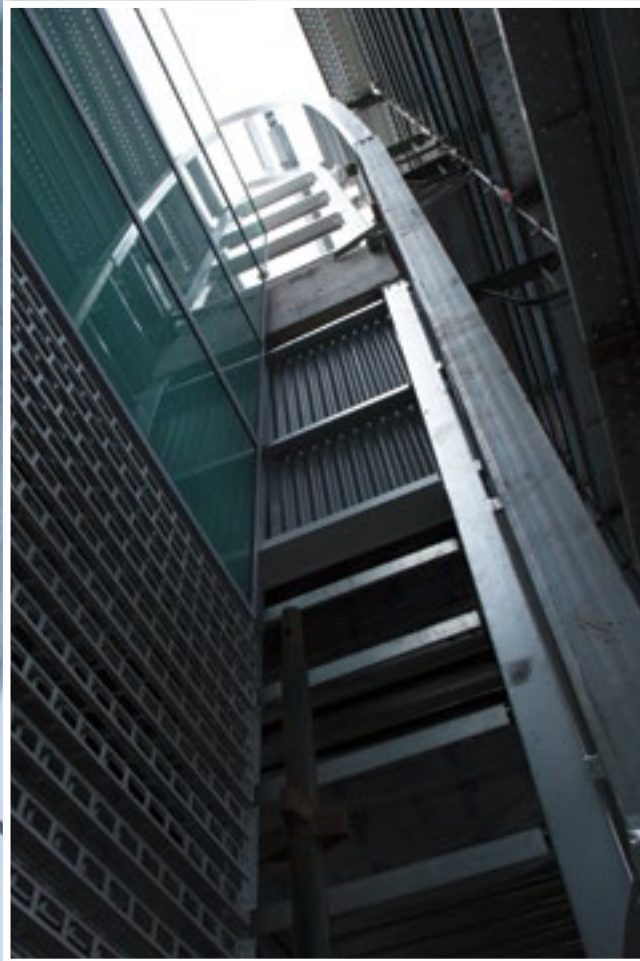
Air Solutions prides itself on its research into new products, on providing superior solutions to the building services industry and on its nationwide reputation.

“For over 20 year we have worked closely with our clients to ensure that the equipment supplied is of benefit to the installation, is installed correctly and provides the performance that is required,” says Paul Sewell.

“If there are any problems we work extremely hard to ensure that these problems are overcome. In simple terms, we back our products. We believe that the industry knows that and this gives them faith in our products and services.”

For more information contact Air Solutions International Pty Ltd, Suite 404, 20 Bungan Street, Mona Vale NSW 2103, phone 02 9979 7299, fax 02 9979 1145, email PSevell@airsolutions.com.au, website www.airsolutions.com.au





Below Solutions 4 Steel applied their experience and professionalism to provide a large scope of steel.

Solutions 4 Steel Pty Ltd is the structural steel fabricator that provided the structural steel elements to the Global Switch Sydney East Data Centre project. The Australian company's scope of works included structural steel shop detailing, fabrication and installation of the facade support structure, wall stiffeners, roof steelwork, mezzanine floors, stairs, balustrades and steel grating.

Solutions 4 Steel's senior management has a combined 40 years' experience in structural steel, even though the company is relatively new. With 35 full time employees and offices located overseas in the Philippines, China, Vietnam and Singapore, the company has undertaken a significant number of large projects.

The project team for the Global Switch Sydney East Data Centre project included Jeff Rankin (Project Manager / Business Development Manager), Padraig Corrigan (Site Manager), Mairil Balagtas (Design Manager) and Rohan Arnold (Managing Director).

One of the major challenges the team faced was the timeline associated with the design and construct nature of the project.

"This meant that Solutions 4 Steel had to be an integral part of the design team and move with the project as required," said Rohan Arnold.

"A full BIM model deliverable was a client requirement and S4S delivered accordingly. Additionally, Solutions 4 Steel provided a fully hot dip galvanised solution to the project to enable long term corrosion protection and minimise possible Head contract defects."

Solutions 4 Steel imports fabricated steel to Australian standards for a wide variety of projects that include mining, mechanical, hospitals, universities, churches, schools, shopping centres, police stations, jails, factories and industrial projects.

Examples of hospital projects Solutions 4 Steel is currently working on or completed include the Canberra Hospital Acute Mental Health project, ACT, various buildings at the Royal North Shore Hospital and The Kinghorn Cancer Centre, Sydney, NSW. Examples of university projects Solutions 4 Steel has completed include the ANU College of Business and Economics in Acton, ACT and the University of Western Sydney Blacktown Hospital Clinical Site Building in NSW.

Solutions 4 Steel's involvement in unique and complex projects highlights the company's capabilities. Two examples in NSW, St Barnabas Church, Broadway, with its curved roof structure and the Ravenswood School

for Girls, Gordon, with its unique structural design, both required Solutions 4 Steel's attention to detail.

The Ravenswood School for Girls project consisted of three separate roof structures of which one consisted of 2 extremely large and unique wall trusses. These wall trusses acted to support a counter levered slab below. Each truss required hundreds of man hours of full penetration butt welds on site to ensure the integrity of the structural design. Once the trusses were fully erected and welded they were then tensioned with VSL bars down to ground level with 500 kN of force.

Solutions 4 Steel shop detailed, fabricated and erected over 800 tons of steel for the Canberra Centre project in Canberra City, ACT. The work included 2 pedestrian bridges, a cinema complex with approximately 220 tons of detailed roof steelwork, several awnings both at low level and high level throughout the project and over 200 tons of car-park screens. The extremely tight time schedule for completion meant that Solutions 4 Steel's dedicated team operated 24 hours a day onsite.

Solutions 4 Steel takes pride in having installed the facade steelwork for the Global Switch Sydney East Data Centre project with zero defects and therefore ensured that the following facade cladding contractor was able to progress in a rapid and efficient manner. "This is now the eighth contract Solutions 4 Steel has been involved with Cockram and each project has seen the relationship strengthen," said Rohan Arnold.

For more information contact Solutions 4 Steel Pty Ltd, Level 29, 2 Chifley Square, Chifley Tower, Sydney NSW 2000, phone, 02 9238 8001, fax 02 6260 5222, email jrankin@solutions4steel.com.au



Below Schneider Electric once again provided the most quality products to Global Switch on many fronts.

Below Mesh & Bar's experience in the reinforcement industry has resulted in another very successful major job.



Schneider Electric is a global specialist in energy management. Focused on making energy safe, reliable, efficient, productive and green, its 150,000 plus employees in more than 100 countries achieved sales of 24 billion euros in 2013, through a commitment to help individuals and organisations make the most of their energy.

The company has been present in Australia for about 50 years and currently employs over 4,000 people. It provided Global Switch with expertise, products and solutions.

Schneider Electric's StruxureWare for Data Centre software, has been installed at the Global Switch Sydney East Data Centre to manage the centre's building management system, energy monitoring system and SCADA system. To ensure the ideal room temperature is maintained, Schneider Electric Uniflair Computer Room Air Handling (CRAH) units have been installed.

Schneider Electric has also provided Global Switch with a solution for their energy distribution system, utilising the Premset Switchgear. This switchgear is SF6-free and uses the Shielded Solid Insulation System (2SIS), a breakthrough innovation that helps ensure a safe, trouble-free service life.

"The delivery of this project builds on a long-standing relationship between Schneider Electric and Global Switch," said Matthew Shannon, Schneider Electric's, Global Switch account manager.

"We have been their incumbent supplier for the past decade, and had we not done a good job over this time, by maintaining a long-standing, positive relationship, then we would not have been in such a strong position to be considered for work on the new data centre. Our success here shows that we can deliver a strong solution on many fronts."

Schneider Electric takes pride in their full range of services encompassing strategic consulting, design, engineering, maintenance contracts, support and education "When you partner with Schneider Electric you don't just get world-class quality and cutting edge products and solutions," said Matthew Shannon. "You also get the benefits of our five star total service and support package

For more information contact Schneider Electric (Australia) Pty Ltd, 78 Waterloo Road, Macquarie Park NSW 2113, phone 1300 369 233, website www.schneider-electric.com.au

Mesh & Bar Pty Ltd is one of Australia's leading independent reinforcing steel suppliers. This company supplied the Global Switch Sydney East Data Centre project with all its reinforcing steel requirements. Mesh & Bar met the very tight building programme, the major challenge of the project for a reinforcing steel supplier.

Mesh & Bar moved to larger premises in Sydney in May 2012 and now has offices in Newcastle, Wollongong, Melbourne, Brisbane and the Sunshine Coast.

"Mesh & Bar employs very experienced professionals from the reinforcement industry whose combined industry experience exceeds 100 years," said a company spokesperson. "It is this industry experience and expertise coupled with investment in the latest plant and equipment ... that has helped the company to grow to its present strength."

Mesh & Bar provide a full service of scheduling and supply. It supplies a wide range of concrete reinforcing products such as reinforcing mesh, reinforcing bars and concrete accessories. Welded prefabricated cages can be supplied for piers. Complex reinforcement bending and saw cutting are other services Mesh

& Bar can provide. The company can deliver with semi trailers or rigid body tray trucks which have fixed cranes on their body to assist with the unloading of materials on site.

Other projects Mesh & Bar are working on for Cockram Construction include the Northern Beaches Christian School the Barcelona Project. Other projects Mesh & Bar have completed in NSW for Cockram Construction include the John Hunter Hospital in Newcastle, the Medical Sciences Building West at Newcastle University and the Ravenswood School for Girls in Gordon.

Mesh & Bar's philosophy of customer service is to "provide cost effective solutions and proactive service with uncompromising quality" and "to establish long term strong relationships with its customers."

For more information contact Mesh & Bar Pty Ltd, 15 Owen Street, Glendenning NSW 2761, phone 02 9832 2000, fax 02 9832 2550, email salesnsw@meshbar.com.au, website www.meshbar.com.au

Below Townsend Group met the challenge to realise the modern architectural forms on a large scale.

Below Spacepark Global maximised room and convenience during construction of Sydney East Data Centre.

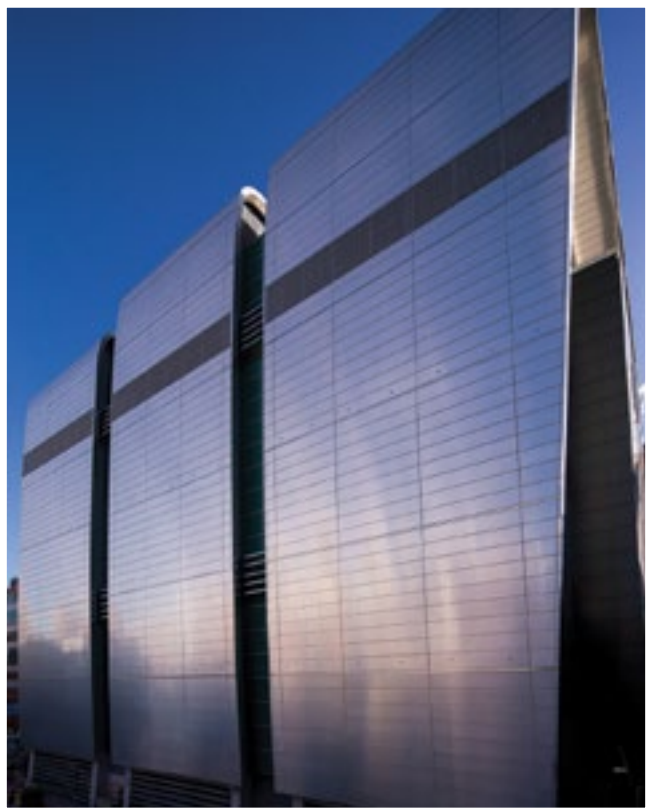


Photo credit: Josh Hill Photography

“The people for superior metalwork” is Townsend Group Pty Limited’s motto. The company is an award winning supplier of custom made and architectural metal components.

Townsend Group designed, engineered, manufactured and constructed the elements of the facade for Global Switch Sydney East Data Centre. Townsend Group developed a close liaison with the architect, builder and Global Switch to ensure that the design intent was achieved. The building’s primary façade is in the form of a continuous curve, starting with the roof then draping over the edge of the building, described as a ‘veil’ by the architect.

Townsend Group was up to the challenging task of providing a seamless transition of wall to roof cladding over different planes. Townsend Group’s manufacturing facilities are equipped with the latest technology. Its 3D modelling capability allows it to simulate virtual assemblies and test a components function prior to manufacture. Overall, there was 4,400m2 of Alucobond wall cladding, 535m2 of profiled wall cladding, 142m2 of perforated, profiled wall cladding, 706m2 of louvres and 465m2 of curtain wall.

Townsend Group has completed many projects in Australia and Asia. Some of its projects include; Telecom Corporate Headquarters,

Melbourne (access flooring); Epping Chatswood Rail Line, Sydney (ceilings/cladding/louvres); Federation Square, Melbourne, (Cladding); Oakford Apartments, Melbourne (glazing); Westfield Sydney City Centre (stainless steel cladding and ceilings); and New Parliament House, Canberra (furniture). The company has won a number of Engineering Excellence Awards (National Maritime Museum, Sydney; Tsing Ma Bridge, Hong Kong; Expo Railway Station, Singapore; Zurich Financial Services’ HQ, North Sydney).

“Townsend Group’s leading market position has been earned through an awareness of customer needs, adaptability and innovation in design, a culture of quality in manufacturing, and first rate customer service,” said Mark Ryan, General Manager Sales, Architectural.

“The Global Switch Sydney East Data Centre represents one of many modern architecture forms to come, which are both challenging and rewarding. Townsend Group is proud to have the technical expertise, plant and machinery and the construction skill sets to create these new forms”, said Mark Ryan.

For more information contact Townsend Group Pty Limited, 50 Barry Avenue, Mortdale NSW 2223, phone 02 9533 4066, fax 02 9153 8504, email sales@townsendgroup.com

Spacepark Global Pty Ltd supplied and installed the truck turntable in the loading dock for the Global Switch Sydney East Data Centre project. Spacepark

Spacepark Global boasts an experienced team, dedicated to solving parking problems. They conduct ongoing research to source the latest technologies for their parking solutions, paying close attention to everything from drive systems to motors and controls.

“We make parking cars, trucks and freight simpler than ever, with rotating turntables and car stackers for residential, commercial and industrial spaces that need creative parking systems,” says a company spokesperson.

“Made from top-quality, Australian-made components, our vehicle turntables are tough, reliable and built to last.”

Spacepark Global is an Australian-owned, family-run company which has been operating for more than 30 years. Spacepark Global install vehicle turntables in driveways, loading docks, auto workshops, warehouses and a range of other commercial and residential spaces.



The company has a standard range of vehicle turntables ranging from 3.6m in diameter for a 3 ton car to 12.5m in diameter for a 30 ton truck. There are options of using different materials for the turntable surface including tiles, pavers, concrete, timber and galvanised, checker plate flooring.

“Because of our in-house design and manufacturing resources, we have the unique ability and flexibility to respond quickly and intelligently to particular customised demands. We pride ourselves on responding to client needs and wants,” said a company spokesperson

For more information contact Spacepark Global Pty Ltd, 1/3 Gatwick Road, Bayswater VIC 3153, PO Box 182 Park Orchards VIC 3114, phone 1300 64 00 70, fax 1300 640 072, email info@spacepark.com, website www.spacepark.com



The turntable in Sydney East Data Centre is 10 metres in diameter.