PITCH PERFECT

The creation of a new Northern Stand at the SCG is the second of a series of major projects transforming the precinct into an iconic sports and entertainment hub within minutes of Sydney's CBD.

SYDNEY CRICKET GROUND REDEVELOPMENT / AW EDWARDS



immunining and

class sporting and entertainment venue.

With a project value of \$197.5m, the Stage 2 redevelopment involved the construction of the new MA Noble, Don Bradman and Dally Messenger Stands, including 13,360 seats and taking the ground's seating capacity to 48,000.

The project also included the installation of a 276m² video board, corporate suites and function rooms, kitchens, wet areas and back of house facilities.

"We started here in 2012. Initially we were on an Early Contractor Involvement, so we were at the site for six months before the project began. The first hole was dug in August 2012 and the first slab poured on the 7 November," AW Edwards Associate Director Matt Bourne said.

Initial works saw the removal of around 21,000 tonnes of material. A total of 36.000m³ in bulk earthworks was removed from the site.

Manager and

Sporting and entertainment events continued to be held during the redevelopment, including the Ashes Test in January and two Major League Baseball matches in March.

However, AW Edwards is certainly no stranger to working on active major venues. It completed the SCG's Victor Trumper Stand (Stage 1 of the ground's redevelopment) in 2008, the Sydney Showground Main Arena Redevelopment in 2012 and the GWS Giants Training and Administration facility at Olympic Park.

"We had different milestones in our contract because we were working with a live venue and had to put in a lot of planning, which can be difficult and time consuming. However the Sydney Cricket and Sports Ground Trust had a commitment to its clients and their events as well as sporting fans," Matt said.

"Our major milestone was to release 13,000 seats by the Ashes, which we delivered. Then the baseball came up, which was a late addition to the program, however we had planned quite well for that and were able to open the seating up again."

The completion of the Sydney Cricket Ground Stage 2 redevelopment by AW Edwards has transformed the sporting icon and further cemented the site as a worldThe company also had to plan around Rugby League and AFL games, but similar to the Ashes Test, had plans in place to ensure fans could cheer on their team.

"Basically we would retract the site so it could be opened to the public, then, once the event had finished, we would go back again - so we did a lot of planning. We also have a good relationship with the Sydney Cricket and Sports Ground Trust and are used to each other's expectations and standards," Matt added.

One of the other notable features of the redevelopment is its unique roof, designed by ARUP and roof sheeting supplied by Fielders.

"The roof was a major one. It is a Fielders freeform roof sheeting product with each sheet individually rolled and made for each section. These were all rolled on site and put up separately - the roof is one sheet from start to finish." Matt said.

"The lining with its horizontal gantries looks as if the roof is floating. It is quite a unique thing."

To ensure the ground and the site's infrastructure was not disturbed by scaffolding, two mobile platforms were developed to complete the roof.

This solution and AW Edwards' overall work and commitment to safety on the project, saw the company awarded the Master Builders' Association Excellence in Construction Award for Site Safety.

AW Edwards is continuing to work on a number of significant projects, including the new multi-million dollar Wollongong Private Hospital base building, the Children's Medical Research Institute in Westmead and St George Hospital Accident and Emergency Department. It is also starting work on a number of schools.

"We have quite a mix of private, public and sporting projects." Matt added.

For more information contact AW Edwards Pty Ltd, Level 1, 131 Sailors Bay Road, Northbridge NSW 2063, phone 02 9958 1474, fax 02 9958 6208, website www.awedwards.com.au.

DME was one of the major contractors commissioned to work on the new Bradman/Noble Stand at the iconic Sydney Cricket Ground. The company's brief was to fabricate four hundred and forty (440) tonnes of structural steel trusses and beams and to then install this architecturallycomplex, curved steelwork to create the entire roof structure of the new stand.

The stand is approximately seventy-five metres tall from ground level to the front edge – the team working at heights of up to 80 metres in places. The fabricated steel members were installed on to large vertical columns on either end and in the centre of the stand. These columns support the roof that "floats" over eighty-five percent (85%) of the stand's seats. Some of the distances spanned were over twenty five metres long. The roof structure is approximately150meters long , 45 meters wide and up to 6 meters deep.

Donald Earle, DME's Managing Director described the job as particularly interesting as "the trusses themselves were designed as single-manufactured members, twenty metres long and six metres high. Due to the RMS transportation restrictions of oversized loads the fabrication work had to be cleverly re-engineered in order to reduce the size of the members without compromising the structural integrity.

This also required a program of final fabrication and preassembly on site. We have a dedicated and highly experienced team at our large manufacturing facility located in western Sydney. The team of approximately thirty, relishes working with these types of challenges, they are continuously striving for the best manufacturing results for the client, in the most cost effective way."

Another major challenge to overcome on this project was that access to the roof structure for the installation was logistically difficult. The concrete base, upon which the stand sits, was limited with regard to the access equipment that could be used.

Therefore alternative access methods had to be pre-planned and engineered. The solution was to construct walkways and platforms, cleverly built into the structure, whilst preassembling the steel trusses and beams. Project manager Darren Latham said "It worked extremely well and allowed our site team, which numbered approximately sixteen, to work independently, avoiding holdups and potential bottle necks with regard to the limited access and the lifting equipment that was based on site. It was always an exciting moment seeing our large steel trusses and beams being lifted into place and fitting together with relative ease. It is a testament to the quality and accuracy of our fabrication that there were 25,000 bolts fitted with no modifications required during installation".

DME Engineering Services is dedicated to providing a high quality, dependable and efficient service that exceeds their customers' expectations. Its team of staff has experience across a wide variety of industries, meaning DME Engineering can provide the fast and efficient services its clients require.

Specialising in structural steel fabrication and installation, boiler, pressure vessel and pipework fabrication and installation, DME Engineering also specialises in mechanical maintenance contracts, crane hire and logistics, engineering and drafting.

DME Engineering Services' comprehensive list of past major iconic projects demonstrates the company's quality of work. This includes the SCG's Victor Trumper Stand, B9 Botany Mill Expansion, ANZAC Bridge Pedestrian Safety Fence, White Bay Overseas Passenger Terminal and M2 pedestrian bridges.

It also completed the manufacture and delivery of the Lucas Heights Nuclear Reactor, the pipework and structural steel for the Sydney Desalination Plant, the chemical recovery boiler for the Visy Tumut Expansion and the Sydney Harbour Bridge New Year's Eve effects.



For more information contact DME Engineering Services Pty Ltd, 70 Peter Brock Drive, Eastern Creek NSW 2766, phone 02 9725 5720, fax 02 9725 1300, email info@ dme-eng.com.au, website www.dme-eng.com.au





With the ability and experience to deliver complete electrical, communications and IT solutions to meet their customers' specific needs, Barnwell Cambridge has a proven track record when it comes to projects and ongoing services.

Formed in 1988, Barnwell Cambridge, which has more than 125 full time employees, is a major contracting and engineering company in the electrical and data communications services.

The Company has built a reputation of undertaking and completing projects that are complex, difficult and unique – which includes the SCG redevelopment.

"The Company has held a long working association with venues such as the Sydney Cricket and Sports Ground Trust, which assists us in the level of experience and understanding necessary in completing and maintaining facilities of this nature," Barnwell Cambridge's Anthony Cambridge said.

The extensive electrical works included the Design and Construction of general lighting, power, feature and external lighting, new roof sports lighting and relocation of sports lighting towers 1 and 6. Included was the installation of the new scoreboard power and communications feeders, services to new and upgraded video sight screens and a private high voltage substation (complete with 4 x 1600 kVA transformers).

The communications installation included fibre and structured Cat 6 cabling, lift and escalator monitoring cabling, and CCTV and security installation. Barnwell Cambridge also installed outside and inside broadcast infrastructure, DAS infrastructure, PA and AV systems and lightning protection.

"The project was unique for a stadium grandstand due to the high level of finishes and Information Services requirements to meet the Sydney Cricket and Sports Ground Trust's brief and to ensure the new stand fitted into the feel and heritage of the Sydney Cricket Ground," Anthony Cambridge said.

"The Trust required the new grandstand to be one of the best on the world stage and to further enhance the playing and spectator experience. The new Noble Bradman Stand featured new member's facilities including the exclusive Trustee Suite, Board Room and Dining Area – with the finishes to these areas rivalling any high-end CBD establishment."

Ensuring the SCG remained operational throughout the redevelopment was essential. Two major sporting events took place during construction – the Ashes Test match and Major League Baseball's opening game.

"This created a major impact in construction, working through staged handovers, and ensuring BCA compliance for all events, whilst accommodating as many spectators as possible. While it was always in the construction program, the management of these events was a project in itself and took many hours of negotiation and review prior the event," Anthony Cambridge said.

"It was a credit to the whole team at Barnwell Cambridge, with site, office and management staff working around the clock at times to allow completion of areas that were not contracted, but necessary to ensure the spectators had the best possible venue at any time.

Barnwell Cambridge is also currently working on various data centre installations, health, industrial, commercal and fit out projects for both the private and government sectors. They are also undertaking works on Fujitsu Australia's North Ryde multi-level office fit-out.

"At Barnwell Cambridge we pride ourselves on the work that we undertake, proof of our success is in the long-standing relationships that we have with our trusted clients," Anthony Cambridge added.

For more information contact Barnwell Cambridge Pty Ltd, 9 Subway Road, Rockdale NSW 2216, phone 02 9556 1666, fax 02 9556 1566, email admin@barcam.com.au, website www.barnwellcambridge.com.au.





When working on the SCG development, General Cranes used two Favelle Favco diesel-luffing cranes. Crane 1 was a Favco 1500 with a 16-tonne winch capacity and crane 2 a Favco M440E, which can be rigged to a 48-tonne lifting capacity.

"Both cranes were chosen for the speed, performance and reliability that is associated with the Favelle Favco brand worldwide," General Cranes General Manager George Micevski said.

With a fleet of 85 tower cranes, General Cranes has one of the largest fleets of Favelle Favco cranes in Australia and is complemented by a range of leading European electric crane manufacturers, including Liebherr, Potain and Wolffkran. The company also took delivery of a new Grove 450 tonne all-terrain crane.

"The Favelle Favco 1500 tower cranes in the fleet have recently gone through an upgrade and refurbishment which included replacing the older "noisier" engines to new quieter fuel efficient Caterpillar engines. The Favelle Favco M440E's are the latest additions to the fleet from the recent acquisition of the LCR tower crane business in Sydney and Brisbane," George said. Each crane took 12 hours to erect. The team included four riggers, a head rigger and a fitter.

General Cranes NSW Operations Manager Mark Farrell, explained that prior to delivery on site the cranes required extensive pre planning and pre service maintenance.

The company's QA required all pre inspections and maintenance to comply with Australian Standards and local authority regulations. Each crane had an experienced three-man crew, including two driver/ operators and a lead dogman.

"One of our operators, who has been driving for 30-odd years was amazed at the amount of steel that went into the grandstand construction. We understand that some 400 tonnes of structural steel was involved with the roof construction alone," Mark said.

In closing, George commented, "AW Edwards are delivering a quality project to the Trust and its members, and General Cranes are proud to be part of that delivery."

For more information contact General Cranes, 14B Hill Road, Homebush Bay NSW, PO Box 428, Altona North VIC 3025, phone 02 9748 8996, fax 02 9748 8819, website www.generalcranes.com.au The striking metal façade of the SCG's new grandstand is not only testament to the experience and skills of The Townsend Group, but its ability to provide cost-effective engineering solutions for complex projects.

The company designed, engineered, manufactured and constructed the majority of the elements for the grandstand's façade.

This consisted of general wall cladding (including the perpendicular fins), ventilation louvres, louvre blade screening for the members' and public entries, and awnings above the food and beverage areas on Level 4. The façade's prominent perpendicular fins were also adapted to float in front of the atrium's glass curtain wall and the open central stairwell. Its commitment to innovation, quality and customer service is emphasised by the Townsend 360 model, which focuses on the circle of services needed to drive client projects from concept to completion.

The project required 4400m² of standing seam and profiled sheet wall cladding, 8000LM of perpendicular fins and 600m² of awnings and louvres. The use of alternative products (not seen before in the market place) provided significant time and cost savings.

FormoreinformationcontactTownsendGroup,"Townsend was proud to be selected as a specialist subcontractor
in providing innovative engineering and products for this landmark
project," Townsend Group Managing Director Russ Hill said.50 Barry Avenue Mortdale NSW 2223,
phone 02 9533 4066, email sales@townsendgroup.com.au60 Barry Avenue Mortdale NSW 2223,
phone 02 9533 4066, email sales@townsendgroup.com.au

"Townsend Group has sought to provide a level of service that exceeded the client's expectation from a material selection, material finish and installation standpoint."

Founded by Mr CD Townsend as a metal spinning company more than 60 years ago, Townsend Group remains a family-owned and operated business. As an award-winning market leader, the company works on projects across Australia and internationally.

The SCG Stage 2 redevelopment is one of a number of projects Townsend Group has worked on with AW Edwards. Previous projects include the Epping Chatswood Rail Link, Liverpool Hospital car park façade, White Bay passenger terminal façade and Nepean Hospital car park.





Delivering a successful formwork package has a lot in common with a winning innings of cricket - it takes the right experienced team, superb skills, the best possible equipment and an ability to respond to specific conditions, as BKH Group demonstrated at the SCG Redevelopment. BKH designed and constructed all the formwork for the new grandstand structure, including the tiered seating works. The seating system required detailed formwork design, as did all the specific works areas within the grandstand structure.

"Typical floors generally involved high strutting in the design with particular care required to provide safe working platforms within the shoring works," said BKH Group Spokesman, Ben Geisker. "BKH implemented our 'Wexdek' table system and 'Wexplank' secondary deck system in combination with metal kingflor decking to allow safe and fast installation of shoring works. We also designed and implemented crane liftable box and shutter systems for all core walls to allow fast construction. "Resources and program have been key challenges on the project, with significant shoring equipment and overtime by our team to accelerate the program for AW Edwards. "BKH have created a good working relationship with our client (AW Edwards) by working closely together in providing engineering and program solutions to the project. We would like to thank the AW Edwards staff for their support and look forward to a valuable relationship into the

future." BKH worked on the project from early stages in November 2012 until final completion in November 2013. They deployed a daily site team of up to 65 people, including three supervisors, a site engineer and full time project manager.

With 18 years of projects to their credit, BKH bring considerable experience to construction programs and a level of engineering expertise which enables them to develop custom solutions for complex structures. By working with BIM and CAD technologies in conjunction with key suppliers and consulting engineers, they are able to resolve issues and construct effective and safe structure package solutions which meet specific project needs.

The company undertakes projects across the East Coast and also South Australia, with current projects including the Wet N Wild project in Sydney, Adelaide Hospital, Barangaroo Headland Park and, what is possibly the most challenging formwork assignment in the country, the organically-shaped and remarkable Dr Chau Chak building at UTS designed by Frank Gehry.

For more information contact BKH Group, 32 Tattersall Road, Kings Park NSW 2148, phone 02 9671 3071, fax 02 9671 2981, email ben@bkhgroup.com.au, website www.bkhgroup.com.au

Offering a comprehensive service, Base Fire Protection Pty Ltd are the specialists when it comes to fire protection including system design, installation, commissioning, servicing, certification and 24-hour maintenance.

The company has a long history of working on successful projects across a range of industries, including health, retail, education, residential, commercial, recreational, industrial and special risk.

It was Base Fire Protection's expertise that was used on the SCG Major projects for Base Fire Protection include the Epping redevelopment, where the company completed the design and to Chatswood Rail Link for AW Edwards, Port Macquarie installation of the complete fire services. This project followed on Hospital for Watpac Constructions and Deco - 155 Clarence from Base Fire Protection's successful involvement in building of Street in Sydney's CBD for Probuild. It has also worked the new Victor Trumper Stand at the SCG. on several ARV nursing homes at Castle Hill for Lipman Construction, Chatswood Civic Centre 'The Concourse' for AW Edwards and the University of Sydney Law Building This included the fire sprinkler system, smoke detection for Baulderstone/Lend Lease.

and warning system, portable fire extinguishers and kitchen suppression system.

For more information contact Base Fire Protection Pty Ltd, Having been in the fire protection service industry for 10 years, 2/13 Watson Road/PO Box 319, Padstow NSW 2211, phone Base Fire Protection has 50 employees all who have been selected 02 9764 5555, fax 02 9764 5559, email enquiries@basefire.com.au, for their extensive knowledge in their particular field of fire website www.basefire.com.au

protection. Several of the company's managers and designers have had over 35 years of involvement in the fire industry

Through its use of up-to-date technology and design, Base Fire Protection's systems are always to the latest standards. Its personnel have also worked in the areas of special risk fire protections, including CO2, Novec, Inergen suppression systems, deluge and foam sprinkler systems.



Starting out as a small operation more than 20 years ago, Langton Roofing and Constructions' reputation for quality workmanship has seen it grow into a company that now handles large-scale projects such as the SCG redevelopment.

Langton Roofing's main work on the project involved the installation of roofing sheeting (using Fielders freeform roof sheeting) and other accessories including gutters and trims. Langton Roofing also installed the skylights and structure for the ground's scoreboard and speaker, and light niches as well as fibreglass nose cones to the perimeter of the structure.

Patrick Langton of Langton Roofing said "In roofing, safety is the number one challenge on any project. This particular project, due to its unique shape and appearance, had many challenges, which were overcome with a combined and committed approach by all trades, personnel and AW Edwards site team."

"This particular project had a tight schedule and ran over the Christmas/ New Year period, this meant staff working overtime and weekends. Due to the size of some of the materials required, nighttime deliveries were required so this meant staff also worked into the night. "On average there were about 15 tradesmen on site at any one time supported by office staff ensuring paperwork was up to date and materials were ordered and delivered on time to meet programme"

Langton Roofing and Constructions had a number of other projects on the go while it was working on the SCG redevelopment. These included the HMAS Albatross at Nowra, Mackay Base Hospital, University of Technology Sydney at Broadway and University of NSW at Kensington. "We have also worked extensively on hospitals, shopping centres, arts centres, schools, universities, and television studios. We even put the roof back on the beautiful Hayman Island Resort after the devastating cyclone Yasi in 2011," Patrick added.

Langton Roofing also has the ability to weld on site and fabricate unique, job specific components as required. It also has trained and qualified staff to design and install Height Safety Protection systems. "We use only quality systems compliant to Australian Standards, backed by Engineers and well known reputable companies. We can also inspect and recertify systems to ensure installed systems remain code compliant."

For more information contact Langton Roofing and Constructions, 1 Watson Road, Padstow NSW 2211, phone 02 9792 4600, fax 02 9772 1408, email langtonroofing@bigpond.com Working around sporting events and to an extremely tight deadline presented the biggest challenge to Neverstop Water on the SCG redevelopment project.

Five Neverstop employees worked on the project, which involved installing the pumping, controls and irrigation equipment in the basement of the new grandstand development.

"Due to the intensive watering requirements of the SCG during their peak sporting season, we only had a small window of opportunity to complete the bulk of the works with less than two days to decommission, relocate and recommission the equipment, which we were able to do," says Director Renni Pitkanen.

"There was a lot of preparation and fabrication prior to the scheduled relocation – about 10 days overall on site including planning the works and plenty of site meetings."

Specialising in water harvesting, irrigation and turf drainage projects, Neverstop Water Group of Companies (formerly solely as Neverstop Irrigation) has been in business for 10 years and has 21 employees.

Below Neverstop Water installed the pumps, controls and irrigation equipment for the SCG Development.

Neverstop Water has undertaken works for local government, sports organisations, commercial and industrial sites, golf courses, civil and landscaping contractors, schools and more.

It is currently working on the Chifley Reserve Stormwater Harvesting and Irrigation Project for Statewide Civil and Randwick Council, Whitlam Leisure Centre Pool Backwash Harvesting and Treatment System for Liverpool Council and the Moorebank Unit Relocation Irrigation Stage 1.

Neverstop Water recently constructed the state-of-the-art irrigation/ drenching system for fire mitigation at the internationally acclaimed EucFACE Climate Change Facility for the University of Western Sydney Hawkesbury. It also constructed the new irrigation system and pumps for the Hurstville Golf Course redevelopment for Hurstville Council.

For more information contact Neverstop Water Group of Companies, 10/32 Campbell Ave, Cromer NSW 2099, phone 02 9982 4553, email info@nswater.com.au, website www.nswater.com.au

