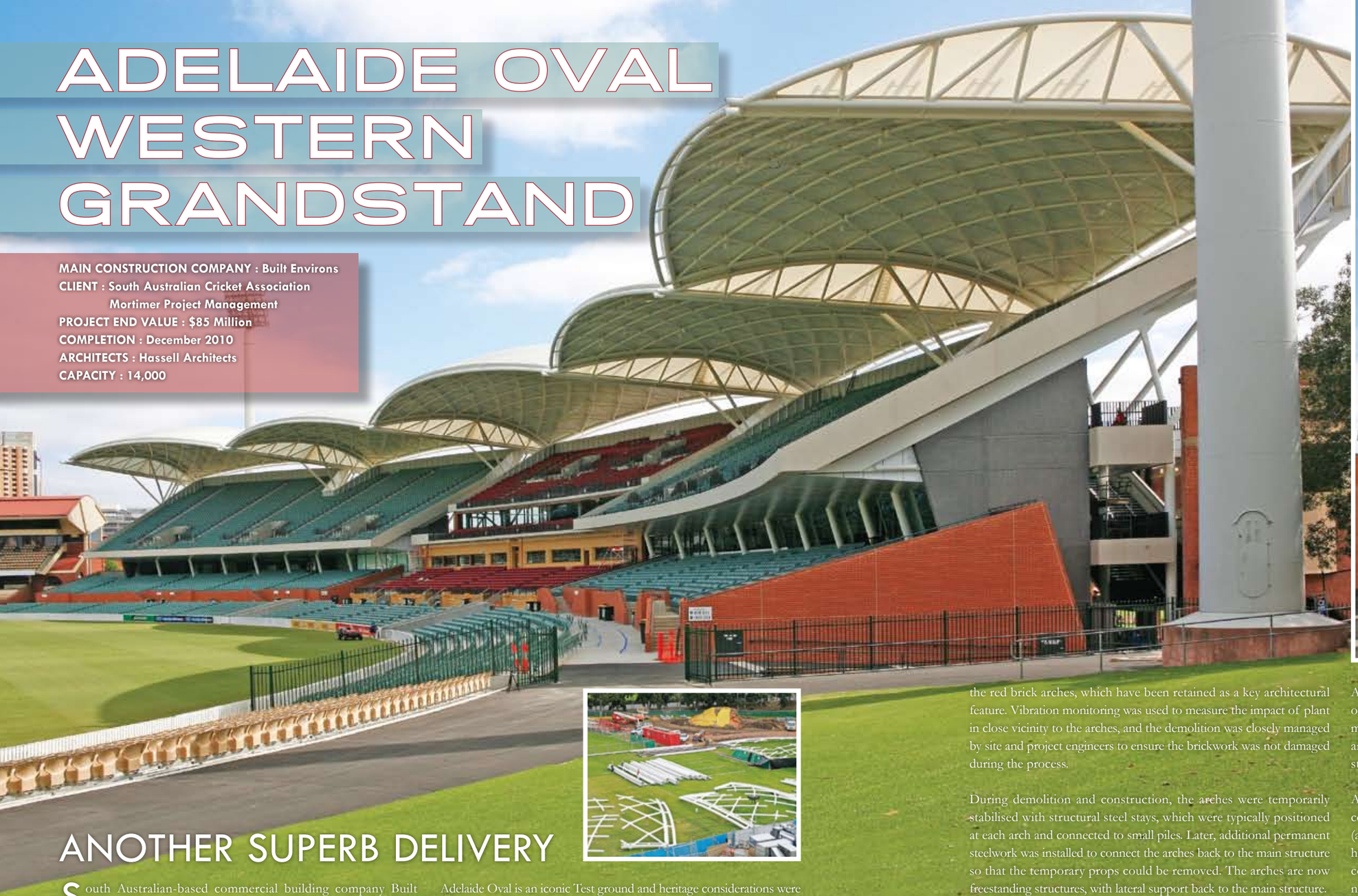
ADELAIDE OVAL WESTERN GRANDSTAND

MAIN CONSTRUCTION COMPANY : Built Environs
CLIENT : South Australian Cricket Association
Mortimer Project Management
PROJECT END VALUE : $85 Million
COMPLETION : December 2010
ARCHITECTS : Hassell Architects
CAPACITY : 14,000



ANOTHER SUPERB DELIVERY

South Australian-based commercial building company Built Environs has achieved on-time practical completion of the iconic new Adelaide Oval Western Grandstand for the South Australian Cricket Association (SACA) – well in time for The Ashes.

Delivered under a managing contractor (MC) contract, the project required the sensitive partial demolition of the existing structures and the construction of a new 14,000 capacity grandstand and facilities, including a 500-seat dining room, four bars, event facilities, operational areas and state-of-the-art player facilities.

As managing contractor, Built Environs led the project team, helping close-out the design so that construction could proceed to the non-negotiable deadline. The Built Environs project team worked very closely with the client, architects HASSELL and Cox, Aurecon and specialist fabricators to refine the buildability of the design and finalise the design documentation.

Adelaide Oval is an iconic Test ground and heritage considerations were very high on the construction agenda. A lot of work had been invested in achieving a design that blended the aesthetic appeal of the ground with a state-of-the-art stadium structure, facilities, and – importantly – views. It was Built Environs's responsibility to realise these design subtleties through close and collaborative construction management.

Built Environs was also tasked with scheduling the construction programme in detail to accommodate sports and other events that were to be hosted at the oval during construction. For obvious safety reasons, the entire construction site on the western side of the oval remained off-limits. Certain events required media access for television footage, and Built Environs made special arrangements to ensure a safe work area for the media.

Demolition was a complex four-month process that required a staged approach that was sensitive to the heritage structure, in particular the red brick arches, which have been retained as a key architectural feature. Vibration monitoring was used to measure the impact of plant in close vicinity to the arches, and the demolition was closely managed by site and project engineers to ensure the brickwork was not damaged during the process.

During demolition and construction, the arches were temporarily stabilised with structural steel stays, which were typically positioned at each arch and connected to small piles. Later, additional permanent steelwork was installed to connect the arches back to the main structure so that the temporary props could be removed. The arches are now freestanding structures, with lateral support back to the main structure.

From the oval side, the most prominent feature of the grandstand is the shell-like roof structure. Each shell is supported by two trusses, with the whole structure supported by six precast columns, each of which is around 1300 mm by 700 mm in section and 20 m high.

Each of the five sections took around four weeks to complete, requiring craning and fixing of the 35 t 30 m-long trusses, placing of the roof segments, tensioning of the structure, placement of the purlins and cladding.

Around 1,300 t of steel was used in the main frame, with around 300 t used in the diagrid roof, which is actually quite light at 55 kg/m^2.

Other major elements in the stand include around 200 precast wall panels and 430 seating plats, as well as precast stair risers and treads.

All of this gives some idea of the complexity of the material aspects of the project. It was also a considerable exercise in relationship management, with multiple local, state and federal stakeholders and an intense media interest in the project, particularly during the SA state election.

As a follow-up to the success that Built Environs had with the 2003 construction of the Chappell Stands on the other side of the Oval (again, delivered to a strict event-driven deadline), the new grandstand has exceeded the client's expectations, and is a clear statement of the company's ability to deliver $100 million construction projects of national significance.

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DESIGNING THE BEST VIEW OF THE ASHES IN AUSTRALIA

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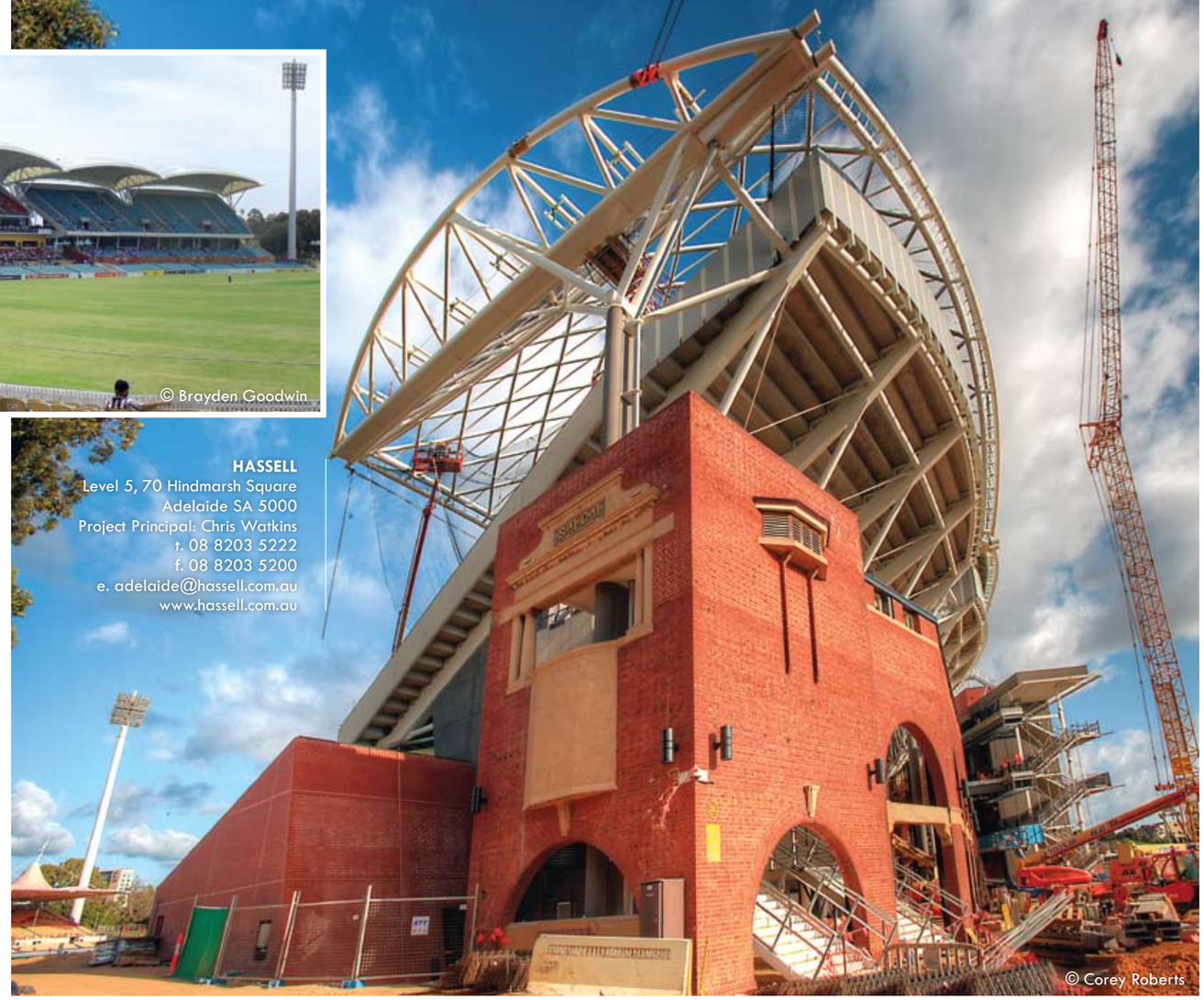
In preserving the essence of a place dear to the hearts of generations of cricket fans, while designing spaces for the future, HASSELL have played a stunning innings. International in practise, and Adelaide-based in origin, HASSELL were lead architect on the Adelaide Oval Western Grandstand project, working in conjunction with COX architects to deliver the design, documentation and contract administration of this, the largest redevelopment undertaken by the SACA (South Australian Cricket Association).

Design and documentation commenced in 2002, with initial lodgement of development consent paperwork. Over the next few years, the evolution of requirements for stadium facilities at the Adelaide Oval saw the design and subsequent documents undergo varied changes. The current 14,000 seat capacity Western Grandstand development is the first stage of a multiple grandstand development which will result in the Adelaide Oval having a seating capacity of 50,000. This will enable the venue to comfortably host international and domestic cricket, AFL, SANFL football and rugby.

Once contracts were awarded, HASSELL and COX worked in close conjunction with the building contractor Built Environs to meet a tight delivery program with the Ashes Series in December 2010 imposing a strict deadline on works. A multi-disciplinary team of up to 30 staff contributed their skills including architects, interior designers, planners, landscape architects and graphic designers.

"There were many significant challenges associated with this project. Among the largest was designing a facility that by its very nature had to be modern in appearance and functionality but sympathetic to the existing heritage fabric and remaining elements of the previous Grandstand," said Chris Watkins, Project Principal HASSELL.

"Being such an iconic place within the South Australian psyche also offered a challenge. Adelaide Oval has often been referred to as amongst the most picturesque in the world. Our challenge was to determine why this is so and ensure our design did not adversely affect such a reputation. This was a huge responsibility, but also a huge opportunity and a challenge we relished.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"We decided the most appropriate response was to break down the scale of the facility from what could have been one single element (so common in many contemporary stadia designs due to efficiency), into five separate bays, with a larger "pavilion" in the centre flanked by two smaller bays either side. The resulting scale of the smaller pieces is more suited to the smaller series of buildings and stands present on the site.

"The design of a grandstand is largely determined by the response to its functional and pragmatic brief. Factors such as how many seats, the optimum viewing angle for sightlines, the maximum distance of travel to an aisle or path of egress and therefore time of egress, the spacing of the seats and the percentage of seats covered by the roof. Other functional requirements such as food and beverage facilities, bars, kiosks, dining rooms, circulation and players facilities are then threaded into the structure taking care not to compromise spectator viewing, and maximise valuable "viewing frontage".

"However, a grandstand also needs to evoke an emotional response in patrons, part of the thrill of the event. This stand in particular needed to carefully plot a course between providing a modern facility and the need to retain the unique experience of the ground. We worked hard to avoid the lack of intimacy and sense of place that characterises other stands around Australia. The cricket experience here is intimate - one of catching up with friends, seeing the players and of course watching the cricket. It's very festive and the stand captures this. It's a very Adelaide grandstand".

"The structural engineering solutions required for this type of building – due largely to their size and requirement for uninterrupted, column free viewing – are often complex and sophisticated presenting the opportunity for a "structurally expressive" aesthetic where each structural member is visible and each connection designed to express the structural loads carried within it. The Western Grandstand Redevelopment explores this idea with its expressed structural diagrid roof, supported by the PTFE clad trusses, through to the expressed structure of the upper-bowl supporting steel. Care has been taken not to confuse this idea with all the structural load paths clearly identifiable to the ground."

In addition to the grandstand, new facilities include function rooms, members bars, corporate facilities and a 600 seat dining room all with views of the oval. As part of redevelopment works, SACA reshaped the oval, previously closer to a lozenge shape with a 'short', flat western boundary. The reshaping to true oval brings the stands up to 15m closer to the centre square in both pockets and lengthens the western boundary.

The overall result of HASSELL's efforts is a world class stadium, with unsurpassed spectator viewing and the best sight lines of any major Australian cricket ground, which still maintains the integrity of the Heritage features of the Adelaide Oval.


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AWARD WINNING ALL ROUNDER

From deconstruction to civil construction, All State Group put in an award-winning effort on the Adelaide Oval project. Their scope of works included engineering to design and construct of the piling for structural supports; design and construct and installation of the structural stays to support the Heritage wall; Asbestos removal; detailed deconstruction of the grandstand and full deconstruction of certain aspects of the grandstand; remediation of contaminated materials including transporting and disposal off site; bulk excavation, civil works and temporary building pads and car parks including heavy duty drive ways for heavy plant access and egress; and supply and install wheel wash bay for all trades at entry and egress points.

Their performance on the project was recognised with a 2010 South Australian Master Builders Association Award for Excellence in Services.

A total of 30 ASG staff including Engineers, Project managers, Site supervisors, Foremen, boiler makers, site safety officers and trained qualified operators, cranes operators and riggers, deconstruction and civil works staff worked at the oval over an eight month period.

Challenges included not only the ongoing operation of the oval, and therefore the presence of the public adjacent to the site, but also the sensitive nature of the work on the Heritage wall.

"To protect and ensure the heritage wall was maintained with minimal vibration, the client had installed vibration monitors to the wall to ensure we stayed within our limits," explained ASG Managing Director, Stan Kapoulitsas.

"We achieved 99.8% recycling on this project, everything bar the asbestos was recycled. Certain timbers were removed carefully and sent to Victoria to be treated and were reused on the new structure. All Asbestos containing materials were removed within our guidelines with no risk to all other trades including our own working on site."

ASG's Quality Management System is certified by SAI Global to AS/NZS ISO 9001:2008, and Health and Safety to AS 4801. This dedication is also applied to their Environmental Management Systems. ASG have been responsible for the safe and effective remediation of some of South Australia's most environmentally significant contaminated sites, and have also undertaken the removal of asbestos from some of the State's most heavily contaminated buildings.

The company takes a proactive approach to ecologically sustainable operations, working with stakeholders to identify environmental risks at an early stage of works, and implementing work practices which both prevent pollution and demonstrate responsible re-deployment of deconstructed materials.

ASG have been in business for a decade. In 2007, ASG bought out PT Building Services, a 30 year old company, making ASG now the most qualified and professional team in the industry.

With one of the largest most experienced demolition workforces in Australia and a comprehensive range of specialised plant & equipment, All State is a completely integrated company which can offer clients a complete package of deconstruction, remediation and civil works. With both civil and demolition teams working together on site, coordinated by ASG's experienced and safety-focused project managers and foremen, civil works and demolition works can be carried out simultaneously, resulting in enormous efficiency benefits and saving both time and money.

The planning methodology on every project involves proper consultation and coordination with local government, other relevant authorities and local stakeholders. All structures are systematically re-engineered and de-constructed to enable achieving the highest level of safety and minimise risks to persons and property.

Other projects ASG are currently working on include demolition and civil works for Burnside Village, entailing Asbestos removal, demolition, Bulk excavation, detailed excavation, piling, Shotcreting and remediation. ASG are also using highly specialised demolition methods to demolish the structure of a warehouse in Wingfield which had been comprehensively fire damaged, and another fire damaged warehouse in Pooraka which also needed technical demolition so as to protect a neighbouring wall from collapsing.

"We are all about service and professionalism, our core values are Performance, Quality and Integrity," said Stan Kapoulitsas.

"Our specialty is technical deconstruction of buildings, this is where the team at All State can show their true ability and professionalism."

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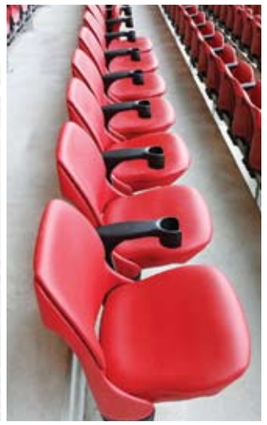

FANS SIT ON WORLD'S BEST

SEBEL FURNITURE
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Australian spectators have been sitting on Sebel Furniture seats for several decades, and the new Western Grandstand seating at Adelaide Oval is Sebel's latest design, offering excellent ergonomics and comfort.

Sebel manufactured and installed approx 14,000 seats for the new grandstand, in three different styles. The majority of the seats are the Viva tip up model, which is the same seat they have supplied for the world-famous Lansdowne Road (Aviva) Stadium in Dublin, where 52,000 Sebel Viva seats have just been installed in two complementary colours. The red shade was chosen specifically to complement the heritage values of the central stand and façade. Sebel also manufactured and installed 630 Podium Chairs for the Giffen Heritage Stand, a premium Members area, and the Encore model for the Players area. Sebel were also contracted to provide loose furniture as part of FFE, including dining tables and chairs for catering.

"Experience and track record are extremely important on these major projects," explained Sebel Spokesman, Declan Brennan. "Installation timeframes are often very tight and can become further compressed as the project develops. Experience provides the ability to foresee a potential problem and take the necessary preventative measures."

Sebel's local Adelaide representative, Peter Wells who has been serving the needs of SACA for over 20 years commented, "Adelaide Oval is also a world first in that it is the first installation of the Viva seat with the new larger backrest, which specifically takes account of the longer sitting time at cricket matches. Sebel is a world leader is this field, SACA are getting the world's best spectator seating."

Sebel combine strength in design, manufacturing expertise with knowledge and expertise. All the mouldings are manufactured in Sebel's Sydney factory. R&D is ongoing, as the company works to continually improve their products across the specialist areas of hospitality, education, healthcare and aged care, entertainment, outdoor and corporate furniture. A testament to Sebel's reputation is the large proportion of Sebel's products which are exported and can be found in over 50 countries worldwide.

Sebel are currently working on many other major projects; including 4,000 seats for the SA Aquatic Centre; the 25,000 seat redevelopment of Carrara Stadium on the Gold Coast; and seating for Newcastle's Energy Stadium. Also they are supplying furniture to Hansen Yuncken's PPP Super Schools projects across South Australia.

EXCELLENCE IN WATERWORKS

Bringing together the best available hydraulics solutions while respecting the heritage of Adelaide Oval gives Smith Brothers Plumbing (SBP) an enduring international showcase for the skills which make them South Australia's leading plumbing and pipeline contracting business. At the peak of works, the company had up to 20 plumbers, machine operators and apprentices plus two project managers on site undertaking the complete hydraulics contract for the Western Grandstand.

The first stage was the early works of redirections and disconnections of existing infrastructure prior to demolition of the old grandstand. Next, SBP installed new sewer and water connections, site sheds and amenities. From June 2009 until November 2010, the main hydraulic contract works were done; in ground works including sewer and stormwater pump stations, gas service upgrades, in ground fire services and water services.

"The largest challenge for this project was the program. With the structure for the project being so intricate it took a lot of time to be installed," said Smith Brothers Plumbing Site Project Manager, Michael Walters.

"We installed the GAP (Glenelg Adelaide Pipeline) water meter which runs reclaimed water from the Glenelg treatment works. This is installed into a manifold system at the boundary of the project which can be used for the irrigation of the ovals and surrounding areas. This GAP water is also plumbed into the Western Grandstand and feeds all of the toilet cisterns. SBP had to work closely with SA Water to have this system approved and audited prior to this water meter being turned on.

"This project is one of the highest profile projects in Adelaide, and with the international cricket Ashes Test Series this year, will have international recognition. As well as state and international cricket, there are proposed plans for AFL football matches at the oval in the future, and it is a privilege for us to be involved in the sporting future (and history) of South Australia," said SBP Project Manager, Jeff Hegarty.

Smith Brothers have invested in training, skill development and product research to develop expertise in environmentally friendly plumbing systems and products. The company has received numerous awards including the prestigious Minister's Award for Excellence in Apprenticeships in 2008, a reflection to the company's ongoing dedication to skill building and annual recruitment and training of future tradespeople.

Founded over 25 years ago, Smith Brothers Group employ over 130 employees in Construction, Service and Pipeline Technology divisions. Although a big company, they retain a close team approach to business, recognising their people to be the greatest point of difference.

Smith Brothers
Plumbing

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FORMWORK THAT SHAPES UP

When concrete's ready to pour, the formwork's got to be ready to hold it, and on a major project like the Adelaide Oval's Western Grandstand, that takes the combination of skill and logistics Newgen Formwork bring to a site. Newgen supplied and installed all the suspended formwork for the Western Grandstand, suspended stairs, two 30 metre lift cores and all the concourse seating plats.

It was one of the largest projects the company has undertaken to date, with an average of a dozen Newgen workers on site for sixteen months. They used a combination of timber/plywood on Rapid Shor shoring; permanent metal deck (Fielders KF70 Profile) throughout the suspended slabs and a RMD shutter system for the lift cores, which were poured in conjunction, making the accurate allocation of labour and materials a time-critical task.

"One of the major challenges was coordination with all the other trades. With everyone on site simultaneously, our crews were being moved from area to area, depending who was working above or below us," explained Newgen Director, Gary Pettman. "Two of the other trades, Samaras Group and Ferrari Bros Crane & Rigging Service, were of great help in coordinating some of the high access work."

"There was good assistance from Built Environs and especially their safety people on site. Towards the end of the project it became a seven day site, which was a labour management challenge for us, and our workforce was of great assistance with that."

Newgen has 35 employees, and has provided formwork for other major projects including Hansen Yuncken's redevelopment of the QE Hospital Stage Two and is currently on site at the Women's and Children's Hospital. Newgen have also provided formwork for Cedar Apartments, two eight storey apartment towers built by Marshall and Brougham at Westlakes, Flinders Cancer Institute Building for Hindmarsh and a ten level carpark at Wakefield Street for BMD.

The company has been in operation for five years, with hands-on directors Gary and partner Chris Pozzebon bringing decades of major project construction experience into the enterprise. Newgen's approach to the formwork trade is safety-conscious and green, with all timber elements re-used whenever possible. With their own crane truck transport and Manitou forklift, and 4,000m^2 of storage at the company's yard, the company is building a solid reputation for providing top class formwork services for all sectors of the Adelaide construction industry.

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NILSEN'S SWITCHED ON WORK FOR SACA

With just short of a century in the electrical technology field, Nilsen contributed essential expertise to the Adelaide Oval Western Grandstand project, resolving crucial coordination issues during the construction phase. With a non-sequential works program for the electrical installation, rapid and effective communication between Nilsen and Built Environs ensured work could meet the tight time frames and have the lights on for the Ashes action in December 2010.

Nilsen had two senior staff overseeing work for twelve months from October 2009 to October 2010, a Project Manager and a Project Administrator, in addition to a site crew of Project Foreman, three Leading Hands and 25 trade-qualified electricians.

To overcome the challenge of a fixed delivery date, Nilsen, in conjunction with Built Environs, were required to plan works sequentially by the hour for critical work elements.

"Nilsen employed a tailor made CBUS automated lighting program to the Adelaide Oval. We spent numerous hours direct with the client (South Australian Cricket Association) to give them a product which was both easy to use but complicated in its design. The end result was great, the client by the touch of one button could set a program such as Event Night which would set the scene of a match being played at night. The client now has many options at the touch of a button such as Function Day, Function Night, Event Day, Event Night, All On or All Off to mention a few. This has resulted in a major time and energy saving for the client, due to the whole building being able to be shut down in total at the end of each event/function," said Project Supervisor, Mark Camilleri.

"The project was difficult but rewarding - to see a result with all parties involved happy with the end product was the icing on the cake."

Nilsen are a family-owned company with a national presence, operating at the leading edge of electro-technology delivering installation, maintenance and manufacturing services from design to lifetime maintenance and upgrades. Their capabilities span contracting; communications and data; electrical and high energy services; and switchboards.

From offices in every mainland capital city, Nilsen have switched on clients and projects including ANSTO (Victoria), VicRoads, Westfields, Woolworths, Coles Myer, Prominent Hill Copper Gold, Adelaide Airport, Brisbane's South Bank Education and Training Precinct, Perth Arena, One40William Street, Claremont Quarter, WA's Police Forensics Building, Royal Perth Hospital and Perth's Technology Park Fibre Optic Network.

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SAFETY FIRST SCAFFOLDING

When it comes to worker safety, the precautionary approach is a winner. Built Environs ensured the safety of all workers at the Adelaide Oval site through extensive use of overhead protection scaffolding supplied and installed by CD Scaffolding (CDS) beneath the crane working area. CDS also supplied and installed all edge protection and access equipment, including stair accesses, work platforms over escalators, handrails, gantries, slabs and all types of scaffolding.

At the peak of works, CDS had up to 17 workers on site seeing to ongoing installation, moving and safety checking of their access and safety equipment. All CDS staff are trained in working at heights and safe working practices. Company founder and Director, Colin Delaine, has been in the trade for 25 years, and since the company commenced operations in 2005, CDS have completed numerous jobs for Hansen Yuncken, McConnell Dowell and Built Environs. CDS have been supplying scaffolding to Baulderstone for the HNA1 and HNA2 RAAF Base projects for two years now.

With an acre of scaffolding equipment, forklifts for use on site and at the yard, flat tray transport and a location adjoining Adelaide Airport, CDS are perfectly placed to meet the needs of SA's major projects.

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Adelaide Oval Western Grandstand, SA