SOUTH AUSTRALIAN HEALTH AND MEDICAL RESEARCH INSTITUTE (SAHMRI)
The Federal Government funded $200 million SAHMRI facility is the first Australian laboratory on track for an anticipated LEED Gold rating for environmental sustainability.

Unique in every way, the new South Australian Health and Medical Research Institute (SAHMRI) is the result of an outstanding collaboration between the design, construction and engineering personnel involved. The $200 million facility is the first Australian laboratory on track for an anticipated LEED Gold rating for environmental sustainability.

“Hindmarsh had a total of 30 staff working directly on the project in roles such as Project Management, Site Management, Site Safety, Coordination, Services Engineers, Administration, Graduates and Labourers. There were over 60 subcontractors involved, with a total peak workforce on site of over 300 workers; and there are seven key consultants working on the project including Architects, Structural & Civil Engineers, Services Engineers, Laboratory Specialists, Cost Managers, Building Surveyors, Environmental Engineers and Sustainability Consultants.”

Hindmarsh brought a high level of in-house engineering expertise to the project, for tasks including the structural facade as well as commissioning, BIM, shop drawing, value-engineering and rapid issue resolution.

“Our own engineers can design, propose and oversee construction and commissioning solutions to a contractor query,” explained Catherine Tanner – Hindmarsh Building Engineering Services Coordinator.

“With the complexity of the integrated laboratory systems, including a cyclotron area, was a challenge. To have a variety of functions as well as integrate them into a single building is quite unusual, and the relationships of the services with each other needed to be considered.”

In the Cryogenic Room, there are emergency push buttons, various gas detection devices and mechanical ventilation boosting requirements. In an emergency event, security doors disengage, CCTV activates, lighting initiates, and additional mechanical exhaust triggers – one button integrates many services, so there is a requirement for complete overall integrated services testing as well as testing of each individual system.”

Another major challenge was the mechanical air balancing, with levels three to nine open to two atria, and a requirement for every facade panel to be installed and sealed before accurate air balancing can occur. Catherine said the solutions included installing temporary walls where necessary, again a benefit of having construction management and engineering expertise on the same team.

For more information contact Hindmarsh, 57 Wyatt Street Adelaide SA 5000, phone +61 8 8228 4188, fax +61 8 8228 4199, email sa@hindmarsh.com.au, website www.hindmarsh.com.au
Fiberock (formerly marketed as Powerscape) developed gypsum for over 30 years, with the technology for synthesizing a new material called Fiberock. It came about in one of those serendipitous moments 15 years ago.

It came about in one of those serendipitous moments during some gypsum growing research, when some cellulose fibre inadvertently was added to the mix – this was only realized later when the experiment's results were analyzed, and the new possibilities of mixing gypsum and cellulose under specific conditions recognized.

"It is like paperless plasterboard, except plasterboard relies on the paper for its strength, and Fiberock is created by a patented process of growing gypsum under high pressure which interlinks the crystals with paper, so there is no paper needed on the outside. There is also no possibility of delamination, as it is a solid matrix," explained USG Australia's National Business Development Manager, Peter Wood.

Instead of using a variety of lining and board products throughout the SAHMRI, and dealing with all the complexity multiple sources and quantities entails, the project was able to implement the KISS principle by using one product from USG Australasia.

Supplied through Boral, USG's patented Fiberock was used for all the wall linings and wall partitions throughout the facility, including labs, research areas and offices.

A High Density Gypsum Fibre board, USG Fiberock covers a lot of bases – it’s resistant to water, fire, mould and impact, and has superior acoustic qualities.

In total, 30,000m² of Fiberock was supplied, with USG Australasia’s staff working closely with Boral and the builder, Hindmarsh, to make sure supplies were on ground in a timely manner. USG liaised with Boral to forecast project needs well ahead of program to ensure their stock level was increased appropriately.

“Boral were able to organize the entire supply of wall system requirements with one board, instead of up to five different types, which minimized complications in terms of site storage and the logistics of allocating loads to cranes for specific tasks,” said USG Australasia’s Southern Business Development Manager, France Tokay.

"Using one multipurpose board also substantially streamlined the fitout process.”

A leading global manufacturer of building materials and solutions, USG have been innovating with synthetic gypsum for over 30 years, with the technology for Fiberock (formerly marketed as Powerscape) developed 15 years ago.

"Our gypsum is a byproduct of coal-fired electricity plants, which use limestone scrubbers to capture the sulphur emitted from coal-burning. This converts the limestone to calcium sulphate, which we use to make gypsum, which would otherwise be sourced from mining.

"USG is passionate about the science of gypsum, and there is ongoing experimentation at our US operation into new possibilities. The company has been around for 112 years. We were the original inventors of plasterboard, and we have a large R&D Department in the USA.

"In Australia we provide supply of the boards and the joint compounds used with them to contractors and subcontractors, via resellers and distributors.

"The only real challenge with a project using Fiberock boards is for everybody involved to be well-educated in the process, as there are slightly different handling issues compared to standard plasterboard and other familiar systems.

"Specification has also been something of a challenge for us – getting it approved by Government departments who are used to familiar products. SAHMRI is a breakthrough project for us to be given the go-ahead for, as while the product is manufactured in the USA and there was a preference for Australian-made, there is no local equivalent.”

Fiberock has been used in the majority of recent major health infrastructure projects due to its high performance specifications which are ideal for settings such as Royal Children’s Hospital Melbourne, Gold Coast University Hospital, the Mater Queensland and Midland Hospital Perth.

"A hospital might require up to 70 different wall systems – we can narrow it down half a dozen," said Peter.

“It is a finished wall system, and the higher cost of the board compared to conventional plasterboard is balanced by the time, labour and logistical savings. A contractor can achieve with a single layer of Fiberock what other walls would achieve with a double layer.

"Education of architects and contractors is key so they can see the value in the boards – which also includes longevity, and an ongoing benefit is reduced maintenance of partitions and walls.

"As the company that invented plasterboard, this is the next evolutionary step, which helps the industry and the end-user.”

For more information contact USG Australasia, Suite 412, 1 Queens Road, Melbourne, VIC 3004, phone 1800 226 215, website www.fiberock.com.au
ENGINEERING THE LEADING EDGE IN GREEN AND GOLD

Australia’s first LEED (Leadership in Energy and Environmental Design) Gold rated laboratory facility presented Norman Disney & Young (NDY) with a worthy set of engineering challenges, and an opportunity to showcase innovative, sustainable and multidisciplinary expertise in resolving them. The engineering services NDY provided included mechanical, laboratory gases, thermal energy modelling, facade modelling, building automation, fire engineering, hydraulics, acoustics, specialist lighting and facilitating the complete 3D Revit Modeling of the facility.

“Laboratory buildings have a considerable amount of specialist services within the ceiling spaces and tiered spaces and hence require a high level of coordination. The use of 3D modeling in Revit was essential to ensure the services were adequately coordinated and that site clashes were minimized to avoid unnecessary costs and time delays. This also enabled congested spaces to be spatially optimized between services, architecture and structure,” said NDY Director, George Balales.

“The complete building is configured as an Intelligent Building with all systems and services connected over an integrated IP network with intelligent patching facilities over fibre and copper cabling.”

In SAHMRI’s basement, the Molecular Imaging Therapy & Research Unit (MITRU) facility included the installation of the first Cyclotron facility in South Australia producing isotopes for medical purposes. The design of the exhaust systems to the hot pharmacy areas included high efficiency filtration to ensure exhaust air quality meets Environmental Protection Agency requirements. Zone air pressure control and monitoring is also essential to provide the necessary pressure differentials between functional spaces for control of airborne contaminants, which could impact the manufacture of the radio-isotopes. Within the laboratory spaces, the need to maintain close volumetric flow control and accurate monitoring resulted in the use of variable air flow venturi valves on the air distribution system. These are being used in SAHMRI to a greater extent than any other laboratory facility in South Australia.

Other projects NDY Adelaide are currently working on include the Myer Centre Upgrade, Suncorp Data Centre, ALDI SA Distribution Centre, Masters Home Improvement Store, Pinewood Studios Malaysia, Westpac, Edinburgh Defence Building 575, Adelaide City Council building upgrades, West Torrens Council Civic Centre and Ashman Grove Aged Care Facility.

“All NDY people understand and are committed to excellence in sustainable design. We collaborate in an integrated and complementary way to achieve long-term results for our clients and the community,” said George Balales.

“We take a holistic approach to buildings, energy, natural resources, and transportation technologies and how they intersect and impact on our built environment. Our approach to each project takes a considered view on how these elements converge – either individually or collectively – and prescribe solutions to minimize the environmental impact of each component.”

For more information contact Norman Disney & Young, Level 8, 11-19 Grenfell Street Adelaide SA 5000, phone 08 8290 6800, website www.ndy.com

The cutting-edge research which will be carried out at the South Australian Health and Medical Research (SAHMRI) is matched by the extraordinarily challenging structural design of the building. With their many decades of experience in engineering innovative building products, Rondo were able to supply solutions which resolved some of SAHMRI’s key construction challenges, backing them with expert technical advice.

Since the project commenced in 2010, Rondo has supplied their KEY-LOCK® Suspended Ceiling System, Steel Stud and Track, DUO® Exposed Grid Ceiling System, PANTHER® Access Panels, Shutfull and Walk-About Trafficable Ceiling System.

Rondo’s Technical Services team assisted in the design of SAHMRI’s external service walk ways, which are subject to external wind loads, and provided seismic designs for Rondo’s DUO® Exposed Grid Ceiling System.

Rondo’s Wall Design Wizards on the company website were also used by Ceiling and Wall Contractors to ensure several full height walls were achievable as specified. In some cases this resulted in design modifications, with wall heights adjusted to match those calculated on the Rondo Wall Wizard.

The interior of SAHMRI features a large curved steel stair case with spiral sides which were formed with Rondo’s 76mm Stud and Track as vertical support and with Flexible Track capping the Stud to create the spiral curve effect. The plasterboard lining the sides of the staircase is supported by Recessed Furring Channel which is curved around the stud work horizontally.

Rondo’s 76mm Stud and Track was also used to form the curved bullheads on each level of SAHMRI, which are one of the building’s many non-linear architectural features. The curve was set out with Rondo Flexible Track from which stud droppers were installed, and finished at the bottom with similar Flexible Track. The framing braced back to the structure with 76mm stud supports. This provided the framework to which the plasterboard was installed to form the curved bullheads.

Since pioneering the design and engineering of suspended ceilings in 1964, Rondo has grown into a world-leading Australian innovator in substrate systems for the lining industry with export markets in Asia, India and the Middle East in addition to a substantial client base across all Australian construction sectors. Other recent major projects for the medical sector include the award-winning Gold Coast University Hospital, Western Australia’s Fiona Stanley Hospital, Queensland Children’s Hospital and Royal North Shore Hospital Sydney.

For more information contact Rondo, Head Office 57–87 Lockwood Road Erskine Park, NSW 2758 phone 1300 36 7663, website www.rondo.com.au
The challenges included the installation of the atrium ceiling, the spiral staircase, expressed jointed mdf to L00-L03 lift well, expressed jointed plasterboard lining surrounding the main entry and plasterboard lined balustrading/bulkheads to the eastern atrium, which were all installed working from scaffolding.

“Access in many areas was difficult and given the amount of natural light in these areas, we had to ensure the finish was of a high standard.”

Since 1992 CWC has been providing high quality results for South Australian projects, with major showcases of their skills including Adelaide Oval Western Grandstand, M2 at University of South Australia, the Australian Taxation Office Fitout, Fort Largs Policy Academy and the Rundle Place Office Tower including the Bendigo Bank and Adelaide Bank Fitout. Their expertise includes specialist packages including acoustic systems, Barrisol ceilings, timber and carpentry packages, fire-rated systems and insulation.

“Whereas the trend today is to use large format tiles, the Architect went against this trend to create a new look instead with tiles which had a small format of 75x150 mm. To lay so many metres with this format required the team to be both meticulous and have a lot of patience,” said Italia Tiling spokesman Rajan Cherian.

“Having worked on the all recent major hospital projects around Adelaide, Italia Tiling is familiar with the exacting quality requirements a project like the SAHMRI requires. Their scope comprised the supply and installation of approximately 1500m² of tiling over nine levels, including screeding to falls and waterproofing to Australian standards prior to tiling.

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There were two main challenges – managing manpower and materials flexibly across different levels to meet project timeframes, and the nature of the tiles themselves, which were imported from Europe.

“Italia Tiling’s team of up to six tilers and waterproofers used MAPEI waterproofing and adhesives throughout the project, due to the products’ low VOC indicators. All the waterproofed floors were flood tested prior to tiling, to ensure they would meet the high standards required.”

“It was a very prestigious project, and we had an extremely cooperative relationship with the Builder and the Architects,” said Rajan.

“We have worked with most major builders and believe we bring a quiet competence to the projects we are involved in to minimise the stress levels of the all involved. We have a professional, dedicated team who ensure we meet the exacting standards required for projects in a timely manner.”

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“Italia Tiling specialises in supply and fixing of both natural and manufactured stone and porcelain products for projects ranging from kitchen bench tops through to complete solutions in tiling and sealing. The company also provides a complete bathroom renovation service through a separate residential division. With a wide supplier network, and specialised team of tiling and waterproofing subcontractors, they have the resources to complete demanding and complex projects efficiently.

The company’s team, including Directors, Interior Architectural Designer Supervisors and Quality Assurance Manager have been working together for over 12 years, and purchased the business in 2011 to give it new impetus.

Other recent Italia Tiling projects have included the Port Lincoln Airport with Mosepy, Flinders Medical Centre Redevelopment with Baulderstone, and the Flinders Cancer Innovation Centre with Hindmarsh.

For more information contact Italia Tiling Services Pty Ltd, 73 Grange Road, Welland SA 5007, phone 08 8340 0016, fax 08 8340 0039
STUPENDOUS FEATS WITH STEEL

An entirely remarkable project like SAHMRI challenges everyone involved, and gives a company like SA Structural an opportunity to showcase exceptional design, fabrication, installation and project management expertise. SA Structural were engaged by Hindmarsh, Managing Contractor, to undertake a number of various structural steelwork packages within the SAHMRI Building and by Yuanda Australia, Head Façade Sub-contractor, for the delivery of the Diagrid Façade Steelwork package.

Some of the works undertaken for Hindmarsh on the project included the manufacture, fabrication and erection of the Feature Lift Steel Structure, Link Bridges, Animal House Structure housed in the basement, and the geometrically complex feature Spiral Stair Structure.

Yuanda Australia engaged SA Structural to undertake 2 structural steelwork packages for this project, the first being the supply, manufacture and erection of the Conventional Steelwork Package which included the curved BMU space-truss support structure, roof steelwork and western walkway structures. The second package involved the fabrication, re-assembly and erection of the feature Diagrid Façade panels to which were particularly complex and the level of precision required for their delivery extraordinary.

“There were significant design challenges and constructability issues faced during the shop drawing, initial design, fabrication and re-assembly process of the Façade diagrid panels,” said SA Structural Spokesman, Andrew Kantavelos.

“The majority of the frames were unique in size, shape, position and location. The tight tolerances specified required the engagement of full time surveyors using 3D technology throughout the processing, fitting, welding and re-assembly process to ensure adjacent panels would match-fit without expensive trial assembly of all frames. These unique model coordinates were also mapped by 3D survey onsite to verify that the erections tolerances were within the specified allowable deviations.”

Fabrication was undertaken in SA Structural’s facilities, with Structural 3D software used for all pre-fabrication modelling. The company has a staff of 110, with skills including 3D shop detailing and modelling, Boilermaking and welding, Quantity Surveyors, Steelwork Erection, Crane Hire and Project Management. “SA Structural’s ability to work collaboratively with Hindmarsh, Yuanda and the project team to deliver this truly unique structure was paramount for its successful delivery,” said Andrew.


Other landmark projects the company is currently working on include the New Royal Adelaide Hospital, the Adelaide Oval Redevelopment and the Adelaide Convention Centre Redevelopment.

For more information contact SA Structural Pty Ltd, Head Office 9-11 Playford Crescent Salisbury North SA 5108, phone 08 8285 5111, fax 08 8285 5122, email reception@sastructural.com.au