WOOD & GRIEVE ENGINEERS

To us, it's more than just work

Wood & Grieve Engineers - Health Capability

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Our company is our people

Wood & Grieve Engineers (WGE) is an award-winning Australian engineering consultancy built on a strong culture of exceptional client service and best-practice technical engineering solutions.

We provide innovative multi-discipline engineering services to both private and government clients in land development and all sectors within the commercial property development markets. Our clients can access engineering specialists in all disciplines from civil and electrical to acoustics and sustainability.

Here at WGE our people are what truly sets us apart. Our high performance business model is dedicated to maintaining a unique employee culture that empowers our teams to deliver highly personalised, commercially viable and robust solutions.

It is this unique culture that drives our teams to go the extra mile and has seen Wood & Grieve achieve:

- "Best Employer" accreditation in the prestigious Aon Hewitt Best Employer survey in 2012, 2013, 2014, 2015.
- A triple win at the 2015 Financial Review Client Choice Awards for Best Consulting Engineering Firm (revenue $50m-$200m), Best WA Firm and Most Client Focused Consulting Engineer (Grant Holman)

The experience and dedication of our large engineering team is well known in the property industry and with over 500 staff throughout Australia, we have the capability and track record to deliver beyond client expectations on any project.

WGE by numbers

54

The number of years since opening our doors

8

Offices across Australia & internationally

50% +

Of our executive directors started as graduates

70%

Of our 55 principals have been with us for more than 8 years

Over 500

People - we grew by over 30% in the last 3 years

4th Consecutive year

We have been accredited an Aon Hewitt Best Employer

State of the art design for those that need it most

Caring for the sick and the elderly is something that all Australians aspire to do well and with compassion. State of the art facilities backed by state of the art design enables health professionals to do their job well and give optimal care. That's why WGE are the first choice for health and aged care projects.

We've been the team behind many of Australia's major tertiary hospitals, general hospitals, retirement villages and aged care nursing homes. Our team serve both the public and private sector and have been responsible for projects such as the Fiona Stanley Hospital, The Victorian Comprehensive Cancer Centre, Rockingham General Hospital, Affinity Village and St Stephens Hospital.

At WGE we know that our work makes a difference to communities. We approach our work with human eyes yet with a highly technical and clinical work ethic. This balance means outstanding results for you.

Why choose WGE for your next Health project?

1. **We're highly specialised.** Our multi-disciplined engineers have a deep understanding of the special requirements of health and aged care facilities. We have extensive knowledge of clinical processes, traffic flow requirements, various operating theatre requirements, infection control requirements and much more. It's highly technical work and finely detailed and it's what we do really well.

2. **We're engaged with stakeholders from start to finish.** We realise our work is vital to the functioning of your hospital or aged care facility. That's why we work closely from the start with all user groups such as nurses, doctors, clinical technicians, maintenance engineers, support staff and of course patients and residents. Every person is heard and cared for to ensure we deliver the optimal outcomes.

3. **Our most senior staff are at your service.** We understand the consequences can be huge if there is not continuity from design into construction. That's why the senior experienced Project Engineer who starts the job is responsible for the whole job from start to finish and long after completion. We put the most expert team together to ensure seamless outcomes for everyone.

4. **We make it human.** Our work is highly technical, clinical and functional, yet we never forget that the outcome must be warm, welcoming and human. We're driven by your patients and residents to ensure that they enjoy comfortable well-designed private spaces enhanced by warm and tranquil lighting.

5. **Business continuity is foremost.** WGE specialist health engineers understand why and how to achieve the desired construction goal with minimal disruptions to the working hospital. They understand that minimizing downtime and construction impact on the existing hospital is a mandatory requirement and we pride ourselves on this approach to business continuity.

Hospital and health facilities

ELECTRICAL VT MECHANICAL

St Stephen's Hospital Redevelopment

Project value: **$94 Million**
Completion: **2015**

Project description:

The St Stephen's Hospital redevelopment is located in Hervey Bay Queensland and is part of the Uniting Care Health Group. The Australian Federal Government has contributed funds as part of this project to enable it to be developed as the first digital hospital in Australia, operating as a paperless hospital.

WGE were the electrical, mechanical and vertical transportation consultants for this project. Being a digital hospital, the engineering systems such as power supplies and air conditioning were critical elements of the design. The hub of the digital hospital is located within a data centre on site which required redundant air conditioning systems and power supplies to be able to provide full functionality to the site even during power outages from the power authority. This was achieved via the provision of two standby diesel generators and two UPS units with n + n redundancy. Other system resilience measures include the reticulation of duplicated fibre optic cabling between communications racks via redundant paths throughout the facility and provisions for future stages to minimise disruptions to the facility during future construction.

This project was fully documented in Revit, allowing for clash detection and coordination between services, hydraulics and structure, which was particularly useful in coordinating the in ground services trench running the full length of the site from the central energy plant.

Stage 1 of the redevelopment includes the expansion of the existing surgical theatres to a total of 5 theatres, a three level inpatient unit consisting of 96 beds, admissions and administration offices, outpatient medical suites, CSSD and back of house facilities, and the central energy facility. Future stages include expansion of the inpatient unit to a total of 180 beds and a further three surgical theatres.

ELECTRICAL FIRE PROTECTION HYDRAULICS MECHANICAL

The Wesley and St Andrews War Memorial Hospitals, Qld

Project Value: **Approximately $35 million**
Completion: **2017**

Project Description

Wood & Grieve Engineers have been engaged by UnitingCare Health for a number of recent projects at The Wesley Hospital and St Andrews War Memorial Hospital.

High Level Assessment and Gap Analysis

In 2012, Wood & Grieve Engineers carried out a high level assessment of the existing electrical and mechanical infrastructure. A review of the existing services provided advice as to the suitability of the new proposed additional 3 theatres and refurbished existing 4 theatres in The Wesley Hospital. Our review contributed to the budget associated with the electrical and mechanical infrastructure to be determined.

In 2015, we were again engaged to carry out a site investigations of The Wesley Hospital to assess the Mechanical, Electrical, Hydraulic and Fire Protection services and provide a report of the findings with costs for remediation and associated programme. This was part of a “Gap Analysis” exercise, to evaluate the current condition, economical life, adequacy and compliance of the equipment and systems associated with the Mechanical, Electrical, Hydraulic and Fire Protection services of the Hospital. Our investigations covered levels 1- 4 of The Wesley Hospital; covering the following areas: Dialysis, Caesarean theatre, birthing suites, IVF theatre, CCT Suite, CSSD department, Sterile store, Recovery area, Operating Theatres 1 to 7 in original hospital area, Operating Theatres 1 to 4 in Western Annex area and the plantrooms serving the areas.

Student Medical facilities

The upgrade to incorporate Medical Students facilities in each hospital has involved converting existing areas of each hospital to provide a student accommodation facility and varied learning areas including practical clinical-skills training, computer laboratory, traditional class room style teaching combined with sophisticated technology such as, wireless capability, projector screens and/or interactive whiteboards and microphone capability utilised for meetings.

The Wesley and St Andrews War Memorial Hospitals (continued)

The Wesley Hospital - Operating Theatre Expansion

This involved the construction of three new Operating Theatres (OT) 15 to 17 and the complete replacement of OTs 11 to 14 plus ancillary rooms. OT 17 is a hybrid theatre complete with a ceiling mounted CCT Imaging Unit. New Air Conditioning Plant Rooms have been constructed above the 3 new OT's 15 to 17 and the existing 25 year old chilled water plant has been replaced with a new larger system. This project also involved an upgrade to the back up generator, UPS and associated infrastructure.

St Andrew's War Memorial Hospital - Operating Theatre

St Andrew's War Memorial Hospital Operating Theatre upgrade involved converting the existing Operating Theatre 10 to a Hybrid Theatre. The installation involved a ceiling mounted imaging unit which in turn required the replacement of all ceiling mounted services and lights. The existing ceiling was replaced in its entirety. The air conditioning and electrical systems were upgraded to provide the additional capacity to the theatre plus imaging control and equipment rooms. Existing Operating Theatre 13 has been enlarged and the existing services and lighting pendants upgraded to suite.

"I would like to express my appreciation for WGE's assistance and professionalism on this project. In particular, I would like to thank Andrew Bell and Ashley Holm for their positive and pro-active attitude during the entire project duration. Their ability to resolve problems quickly and pragmatically, to the satisfaction of the relevant stakeholders was greatly appreciated and is a contributing factor to the successful outcome of the project. Throughout the project, their level of commitment, communication and ability were extremely high, acting with the utmost professionalism and integrity."

Lavinia Buckley, Calcutta Group (formerly with Aurecon Australia Pty Ltd)

Sunshine Coast University Hospital

Project value: **$1.8 billion**
Completion: **2017**

Project description:

The new Sunshine Coast University Hospital Project is Queensland's first ever hospital delivered as a Public Private Partnership (PPP) project. The hospital precinct incorporates the construction of an industry leading 738 bed public hospital with an emphasis on research and learning, a 250 bed private hospital, the duplication of Kawana Way and the construction of surrounding supporting infrastructure.

The development has an overall expected project value of $1.8 billion, with the private hospital construction completed in 2013, and the public hospital expected to be completed by the end of 2017.

Their background expertise in the engineering health sector, combined with their industry award winning client service reputation, positioned the Brisbane WGE civil and structural teams as ideal members of the State's senior technical advisors for the project.

Upon completion in 2016, WGE's involvement will span some 6 years of specialist technical advice from master planning through to construction phase auditing, to ensure the successful delivery of this iconic Queensland development

In the past 2 years, as part of this role:

- Assisted Queensland Health to establish the site's external services constraints.
- Briefed and coordinated with the stakeholders delivering the external municipal services to ensure that the proposed hospital site demands were catered for.
- Provided input into the site's masterplanned layout in terms of sewer, water, stormwater, roads, car parking, earthworks and access, how these integrated internally, and how they interfaced with external infrastructure.
- Established the technical Civil and Structural portions of the PPP Tender Brief.
- Reviewed and assessed all bid documents relating to the tenderer's proposed servicing arrangements.
- Provided detailed reports on the pros and cons of all bidder's proposals with an acute focus on risk allocation and future servicing flexibility.
- Undertaken detailed reviews of all civil and structural related design drawings and project reports.
- Undertaken site audit inspections throughout construction phase (2012 – 2016).
- Provide Queensland Health with pro-active risk based technical advice as part of their senior advisory panel.

Services provided: Structural and Civil (technical advisory role to Queensland Health)

STRUCTURAL CIVIL

"Wood & Grieve are providing a consistently high quality of engineering and technical advice to the …. project. The complexity of the project is matched by their expertise across a range of engineering disciplines.

Their pro-active and professional approach makes Wood & Grieve a pleasure to deal with..."

Roger Simons, Turner & Townsend Pty Ltd

HYDRAULICS ELECTRICAL MECHANICAL

QEII Jubilee Hospital, Qld - Emergency Department upgrade

Project value: $40 million
Completion: 2014

Project description

Wood & Grieve Engineers was appointed by Project Services QLD as the hydraulic services consultants for the Stage 2 works for the Emergency Department (ED) Project at the QEII Hospital. We are currently providing Construction Phase Services for mechanical and electrical services.

The project consists of an upgrade to the ED with the addition of 11 fast-track bays and an increased capacity for short stay patients requiring observation. As part of the upgrade a new transit lounge was included. The Endoscopy Unit is located on the first level and has been designed to function independently of the main hospital. The Endoscopy Unit comprises of two endoscopy procedure rooms, pre-procedure and post-operative recovery areas, outpatient consult rooms, reception and admissions area, ensuites with change rooms and procedure support areas.

Stage 1 works were completed in early 2012, which included the new palliative-care unit. The works entailed the refurbishment of a portion of the existing third floor ward area of the existing floor space into 4 x single bed rooms and 3 x 2-bed rooms giving a total of 10 new palliative-care beds; one single room was designed for bariatric patients.

Services provided: Hydraulic- All phases
Mechanical and Electrical- Construction Phase Services

Other QEII Jubilee Hospital projects:

- Site Investigation Works (Backlog Maintenance Remediation Programme)
- UQ Training Centre- Inspection & Report and Contract Administration
- Infrastructure Upgrade Investigation and Report- Bathroom Refurbishment
- Investigation and minor works Window Upgrade Project
- Backlog Maintenance Remediation Programme

ELECTRICAL FIRE PROTECTION HYDRAULICS MECHANICAL
STRUCTURAL VT

"On behalf of the families, we are so thankful that your involvement gives everyone involved in the process an absolute confidence in the construction process to deliver Queensland's only children's hospice."

Paul Quilliam, General Manager/ Cofounder, Hummingbird House

Hummingbird House

Project value: $8 million
Completion: Due for completion November 2015
Project description:

It's estimated that 3700 children in Qld are affected by a life-limiting condition, and they need the ability to access medical facilities and 24/7 hospice care in a special place like Hummingbird House.

When complete, Hummingbird House will be the only children's hospice in Queensland and the third in Australia. In Feb 2014 the project celebrated with a sod turning event attended by the Prime Minister Tony Abbot.

Wood & Grieve's engineering team is providing a building design that serves a dual purpose in offering a welcoming child-friendly home environment as well as a high level of pediatric care and safety.

The design team have included sustainable and cost effective features such energy-saving air conditioning system to accommodate 100% natural ventilation where necessary (i.e. when the doors are open). Further running cost reductions are achieved with the solar PV and solar hot water systems as well as LED lighting.

Fire design needed to take into account the mixed building classification as considered by the BCA and the Performance Based design achieved a high standard of fire safety for occupants across the various building uses.

ELECTRICAL | FIRE ENGINEERING | FIRE PROTECTION | HYDRAULICS | MECHANICAL | VT

Caboolture Hospital - 32 bed ward refurbishment

Project Value: **Approximately $8 million**
Completion: **2016**

Project description

In conjunction with Peddle Thorp, Wood & Grieve Engineers are working with Metro North Hospital and Health Service's (MNHHS) and the Caboolture/ Kilcoy Building Engineering and Maintenance Services (BEMS) to achieve a new 32 adult inpatient ward on the third level of the main hospital building.

To achieve this, the existing level 3 Administration area is to be decanted into demountable buildings alongside the hospital building, adjacent to the existing Education and Skills Centre. Wood & Grieve Engineers provided design services for the establishment of services, fit out and covered walkway between the demountable structures and along the Education and Skills Centre.

Progress on the ward refurbishment is planned to commence construction later this year is expected to be completed in late 2016. Wood & Grieve's aim has been to deliver an effective design which does not disrupt other areas of the hospital and, is flexible enough for potential future developments. We are working toward completing the project on-time and within approved funding.

Once completed, Caboolture Hospital will be able to treat an additional 2,500 adult patients each year.

ELECTRICAL | FIRE ENGINEERING | FIRE PROTECTION | HYDRAULICS | MECHANICAL

Mt Isa Hospital - Master Planning Report and A & B Blocks Redevelopment (Stage 3)

Project Value: **Approximately $13 million**
Completion: **2017**

Project description

As part of the $65.19 million Mount Isa Hospital redevelopment, $13.2 million has been allocated to the redevelopment of the maternity unit and central sterile service department.

The WGE building services team are involved in the delivery to upgrade the operating theatre complex, central sterilising department, the Children's Ward in Block B and the refurbishment of the Maternity Ward in Block A. This redevelopment will mean that the paediatrics ward which is currently temporarily located in Block A will return to its normal location in Block B when the new children's area is being developed.

WGE were also engaged to assist in the initial master planning for the redevelopment of Mount Isa Hospital.

ELECTRICAL | MECHANICAL | HYDRAULICS

ELECTRICAL UPD VT

Fiona Stanley Hospital

Project value: **$2 Billion**
Completion: **2013**

Project description:

The $2 billion Fiona Stanley Hospital is the largest building project ever undertaken by the WA State Government. This new health care facility is the major tertiary hospital in the south metropolitan area of Perth providing 783 beds including a 140-bed $225.7m State rehabilitation service.

The hospital includes the following:

- 150,000sqm of floor space over five main buildings
- 6300 rooms in the main building
- 83% single patient rooms in the main hospital
- State-of-the-art technology built into every level of the hospital
- 3600sqm basement, ground level and multi-storey car parking
- Major trauma centre
- 20 operating theatres
- New state burns unit
- New secure mental health unit
- State rehabilitation service
- Approximately 400 inpatient beds
- 4 bunker radiation oncology
- Imaging unit
- Central energy plant building

Many initiatives implemented within the scope of WGE provided services that contributed to this hospital being one of Australia's most technologically advanced hospitals. Such initiatives include:

- Utilisation of lighting control systems to provide greater control and energy efficient solutions
- A structured cabling system that truly incorporates all extra low voltage cabled services (not just the conventional voice and data). The system utilises a distributed consolidation point solution to provide a greater degree of flexibility
- A power infrastructure network which utilises diesel generators, gas co-generation plants and extensive load shedding capabilities to provide an enhanced level of redundancy

ELECTRICAL SUSTAINABILITY VT

Victorian Comprehensive Cancer Centre

Project value: **$1 Billion**
Completion: **2016**

Project description:

The Victorian Comprehensive Cancer Centre (VCCC) facility is located in the Melbourne suburb of Parkville, the heart of Melbourne's research and biomedical precinct.

The VCCC will be the new home of the world renowned cancer centre, Peter MacCallum and a new cancer research and clinical service for Melbourne Health (Royal Melbourne Hospital) as well as the University of Melbourne's cancer research and education facility.

VCCC will provide state of the art research facilities for 1,200 researchers that will be comparable to the best international facilities around, with the aim of attracting the best cancer researchers from the international community.

The facility includes the following specialist areas:

- 160 overnight inpatient beds
- A 42-bed capacity intensive care unit
- 110 same-day beds
- A dedicated clinical trials unit with 24 treatment places
- Eight refurbished medi-hotel beds, with additional space for overnight accommodation for families of country patients
- Over 25,000 square metres of specialised research space
- Eight operating theatres and two procedure rooms
- Eight radiation therapy bunkers
- Education and training facilities

As part of the design process and as part of the design team, WGE undertook a study of the best similar facilities in the USA and Canada. With this experience and understanding, coupled with collaboration of other international consultants, the team were able to influence the building design in areas of infrastructure, research and clinical requirements.

ELECTRICAL SUSTAINABILITY

Joondalup Health Campus

Project value: **$300 Million**
Completion: **2012**

Project description:

The project comprises of the redevelopment of the Joondalup Heath Campus. The project entails the refurbishment and new works to the existing public hospital and construction of a new Private Hospital component. The works are as follows:

- A new two storey private hospital consisting of 170 beds
- New emergency department
- New three storey Ward block
- New medical imaging
- New St John's Ambulance centre
- Inpatient wards and a child care facility
- Expansion of the existing public hospital
- Expansion of the existing public psychiatric unit
- A single storey private psychiatric unit; consisting of beds; and
- Enabling works including car parking, landscaping, relocation of central plant and ambulance depot.

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ELECTRICAL | FIRE ENGINEERING | FIRE PROTECTION | HYDRAULICS | MECHANICAL | SUSTAINABILITY | VT

Queen Elizabeth II Medical Centre Central Energy Plant

Project value: **$226 Million**
Completion: **2012**

Project description:

The Queen Elizabeth II Medical Centre Central Energy Plant (CEP) project was the major enabling project for the redevelopment of the QEII Medical Centre (QEIIMC) site in Nedlands and was delivered as a two-stage managed contract by Brookfield Multiplex during 2011 and 2012.

WGE were responsible for the design and construction phase services for all the building services disciplines on this challenging project.

This $226m project is the largest of its kind in Australia and was completed within an inflexible project programme and within the confines of a fully functional hospital site- a definite challenge for all involved.

The team's use of 3D Revit provided a significant tool for the visualization of the installation, co-ordination of the services and the ongoing operation and maintenance of the building through interfacing to the site's facility management system.

The QEIIMC precinct accommodates a number of current buildings, including the Sir Charles Gairdner Hospital, and has future healthcare facilities planned for the site. These future plans include the relocation of a $1bn New Children's Hospital (NCH) as well as the future relocation of the city's Women's Hospital. This meant that the CEP had to significantly expand to service these new facilities in addition to the existing site. The decision was made by the client that this provided the opportune time to relocate the current CEP to the rear of the site, forcing the incorporation of an extended service tunnel to connect existing infrastructure.

This intricate project was completed on time under a tight programme of work, staged to coordinate with the construction of the NCH. The existing services and CEP were operational during the construction of the new facilities necessitating meticulously planned construction, commissioning, integration and change-over phases.

ELECTRICAL VT

Port Macquarie Hospital

Project value: $110 Million
Completion:

Project description:

The Port Macquarie Base Hospital expansion project is a $110m extension of the existing facility, commissioned by NSW Health Infrastructure and constructed by Watpac Constructions in the growing regional city of Port Macquarie. The project included a new perioperative department that incorporated nine operating rooms, a cardiovascular interventional theatre and a new central sterilising and support department. Additionally the expansion included a new angio catheter laboratory, new intensive and critical care units, a new emergency department and new adult and paediatric inpatient units.

WGE were the electrical, information communications and technology and vertical transportation consultants for the project. The design was fully documented in Revit, which enabled detailed clash detection and coordination between services. This was particularly beneficial in designing services in areas that had limited ceiling void space.

Below is a summary of some of the project details:

- Significant infrastructure works including the undergrounding of an existing 33kV overhead power line and provision of new substations, main switchboard, standby generator and uninterruptible power supplies.
- A high level of digital integration was installed in all of the operating rooms.
- A converged Wi-Fi based telephony, duress and messaging system implemented throughout the new and existing buildings.
- Integrated IP-based telephony, CCTV and intercom systems have been rolled out in the new building and provide seamless integration with the existing systems on the site.
- The provision of redundant optic fibre cable links to each communications room offers a high level of IT system resilience in the building.

WGE worked closely with the local health department to ensure that their operational requirements were met within the budgetary constraints.

Kilmore District Hospital Redevelopment

Project value: $13 Million
Project description:

The project involves masterplanning for the site inclusive of asset assessment in accordance with the requirements of DOH. Also included the provision of Stage 1 inclusive of refurbishment of the Peri-operative area, a new 30 bed ward extension to the hospital and a new outpatient services building.

Services provided: Electrical, Communications / Security, Mechanical, Hydraulics and Fire.

Beleura Private Hospital – New Modular Ward/Day Services Suite & Hydrotherapy Pool Extension

Completion: In Construction, Due 2015
Project description:

WGE have provided full multi-disciplinary engineering for the new hydrotherapy pool & site infrastructure upgrades for the new modular extension comprising a

32bed rehabilitation ward and day-services consulting and physiotherapy gym, the supporting gantry frame and at-grade carpark extension and modifications.

Services provided: Structural & Civil, Mechanical, Hydraulic+Wet Fire, Electrical, Fire Engineering

Dubbo Base Hospital

Project value: **$80 million**
Completion: **2015**

Project description:

A new master plan and new Main Hospital Building including 6 new operating theatres and peri-operative suite and integration of scope procedures within one or more of the equally sized theatres:

- A new Central Sterilising Unit (CSD)
- Day Surgery & Extended Day Surgery
- A High Volume Short Stay Surgery (HVSSS) Expanded/upgraded Renal dialysis facility;
- Dialysis plant;
- New Maternity suite
- Specialist Consulting Suites

References: Michael Roxburgh, TSA Project Management Ph: (02) 9276 1400.

MECHANICAL

Royal Prince Alfred Hospital NW Precint

Project value: **$80 million**
Completion: **2014**

Project description:

A new 5 level facility comprising of mental health, renal dialysis, ambulatory care, eating disorders , consulting and meeting rooms.

References: Paul Edmiston, Savills Project Management, Ph: (02) 8215 8896.

ELECTRICAL VT

Armidale Hospital

Project value: **40 million**
Completion: **2018**

Project description:

The project comprises the redevelopment of Armidale Hospital.

Operational efficiency and on-going cost management has been a strong focus for HI during the concept and feasibility stages.

WGE have prepared a high level energy systems analysis in order to identify for both HI and the project design team of the design direction moving forward.

References: Catherine Lee, TSA Project Management Pty Ltd

MECHANICAL SUSTAINABILITY

Gosford Hospital

Project value: **$400 milliom**
Completion: **2018**

Project description:

The project comprises the redevelopment and extension to the existing Gosford Base Hospital.

As part of the Mechanical Services scope of works, a detailed Green Star pathway has been identified and in addition, consideration to the inclusion of an on-site gas co-generation system.

WGE have prepared strategic reports and concept feasibility for both of the above mentioned sustainability initiatives.

References: Cameron McClement, Aurora Projects Pty Ltd

MECHANICAL SUSTAINABILITY VT

Hospital for Specialist Surgeries (HSS), Baulkham Hills NSW

Project value: **$35 million**
Completion: **2013**

Project description:

The project comprises a five level conversion of commercial space into a private hospital. The hospital will incorporate perioperative areas, including ten operating rooms, in patient wards and rehabilitation services including hydrotherapy, CSSD, consulting and radiography facilities.

Services provided: Mechanical, Electrical, Medical Gases, Lifts, Fire, Hydraulic, Acoustics, Structural and ICT services.

"Wood and Grieve's combined practical based engineering experience with enthusiasm, cooperation and such thoroughness that our Board is confident will continue to be reflected as we start to enter the development / building phase in mid-2013"

John S. Fox BE MBBS FRACS FAOrthA

Lismore Base Hospital, Lismore NSW

Project value: **$80 million**
Completion: **2012-2015**

Project description:

The $80 million Lismore Base Hospital redevelopment project will provide improved access to and equity in the delivery of a wider range of services, and additional capacity to respond to the rapid growth in demand and the needs of the local community.

The Stage 3a redevelopment will deliver a new 5 storey building consisting of an Emergency Department, Emergency Medical Unit, Pathology Unit, Renal Dialysis, Medical Imaging and a temporary Mortuary. The services between the existing and new portions of the hospital will be integrated.

- A new and significantly expanded Emergency department
- Emergency Medical Unit / Care / Fast Track zone
- Expanded Medical Imaging capacity
- A new ambulance drop-off and bay
- A new renal dialysis unit
- A new Hospital Mortuary
- Future expansion space, and
- Refurbished spaces will accommodate an expanded community health unit consisting of purpose designed consult and interview rooms
- A new Pathology Unit and temporary 10 bed Maternity Dept.

Services provided: Electrical, ICT, Security, Lighting, Power and Nurse Call systems

Parkes Hospital, Parkes NSW

Project value: **$41 million**
Completion: **2015**

Project description:

Parkes Hospital provides acute and sub-acute services including emergency, obstetric, paediatric, general medical and surgical services together with a comprehensive range of community and primary health services for the communities living in the Local Government Areas (LGAs) of Forbes, Lachlan and Parkes. The redevelopment comprises a new facility on a new alternative site in the Parkes township, which will include:

- Main entrance and drop-off zone
- 28-bed inpatient unit
- Birthing unit (2 birthing rooms)
- Emergency Department
- Community and Ambulatory Care zone, including 6 chemotherapy chairs and 2 dental chairs
- Clinical Support Services, including SSU, Pharmacy; Pathology Laboratory and Medical Imaging
- Non clinical support services, including a Linen Distribution Centre for the district
- Associated services infrastructure to support the above, including on-grade car-parking
- Relocating health services to the new facility and decommissioning the existing facility.

Services provided: Electrical, ICT, Security, Lighting, Power and Nurse Call systems

Forbes Hospital, Forbes NSW

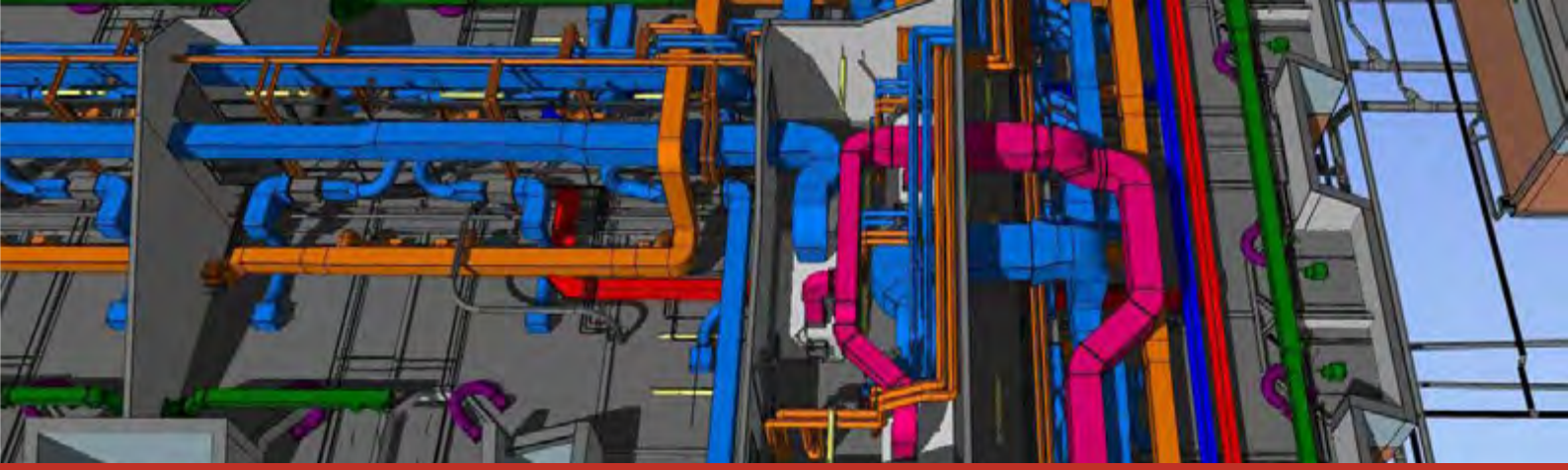
Project value: **$72.5 million**
Completion: **2015**

Project description:

The Forbes Hospital Refurbishment will involve part refurbishment to the existing facility and part new build comprising of:

- A new and refurbished single-storey building to the west of the site encompassing:
  - » Main entrance and drop-off zone
  - » 27-bed inpatient unit
  - » Birthing unit (2 birthing rooms)
  - » Emergency Department
  - » Medical Imaging Department
- Refurbishment of existing buildings to the east to accommodate:
  - » Ambulatory services, including 2 new Dental chairs and expansion of the existing Renal Unit from 6 to 8 chairs
  - » Staff office accommodation and Medical records within the Heritage building (listed on NSW Health Heritage Register)
- Associated services infrastructure to support the above, including on-grade car-parking as required
- Associated staging and decanting

Services provided: Electrical, ICT, Security, Lighting, Power and Nurse Call systems



Revit coordination

2006 - 2015
WGE utilising BIM framework
We currently use Revit 2015

WGE offers a full design studio integrating all Civil and building services into one building model

WGE is committed to the benefits that BIM provides our clients in the short- and long- term.

The implementation of BIM on numerous projects nationally has clearly provided value, both to our clients and WGE:

- Greater clarity for the clients on what they are getting – visual representation
- Improved spatial planning
- Reduced construction related variations due to clashes
- More competitive tender pricing due to greater design clarity
- Reduced project risk for our clients and designers

Recent health care projects in REVIT include:

- St Stephen's Hospital Hervey Bay
- Epworth Hospital
- St John of God- Berwick
- Dubbo Base Hospital
- Gosford Hospital
- Armidale Hospital
- Narrogin Hospital
- Hollywood Hospital- mental health wards,
- Fiona Stanley Hospital
- Karratha Health Campus
- Port Macquarie Base Hospital
- Queen Elizabeth II Medical Centre Central Energy Plant
- Latrobe Regional Hospital Gippsland Cancer Care Centre

Our continual consideration of integrated project delivery has led us to enhance our data integrity. We maintain a considerable knowledge of technologies and software and have had a reasonable influence over the industry with regards to what can be achieved through BIM. We understand that it is a great advantage to use BIM so that the entire project can be documented within one package. We recognise that by using a 3 dimensional model, the potential conflicts are identified at a much earlier stage. Our documentation is delivered in a more meaningful manner. We now utilise colour schemes to make systems and various design data more distinguished. The schedules that are produced are taken directly from the BIM and thus have a higher degree of accuracy.

Our extensive Revit library for all building services has been accomplished through rigorous testing to certify that every element appears and behaves correctly. Consequently, the client can appreciate a more aesthetically pleasing product while we can be confident that the engineering aspects are performing to a satisfactory level, now and in the future.

WOOD & GRIEVE ENGINEERS

Making Green Star easier for you

Wood & Grieve Engineers are leading the sustainability industry by becoming the first consultancy to be approved as a **Green Star 'Recognised Provider in energy modelling'.**

Our team worked with the Green Building Council of Australia (GBCA) to develop and drive this new initiative. Our joint aim:

'To make the Green Star process easier, faster and more consistent.'

You gain greater confidence knowing that you're working with proven Green Star experts.

What does this mean for you?

It means that if you choose Wood & Grieve Engineers to complete your next Green Star project you gain the confidence of working with an experienced and validated provider of Green Star services. This will give the entire project team more certainty surrounding the Green Star submission.

Benefits of working with a Green Star 'Recognised Provider'

- Clients have greater awareness of risk factors within their project
- Increased confidence in expected outcomes
- Our quality control processes are tried and tested
- Reduced, streamlined documentation
- We have the knowledge and experience to make better decisions

"Recognised Providers are technical experts in Green Star - working with a Recognised Provider makes sense"

Romilly Madew, GBCA Chief Executive

There are up to **20 points available** in the Green Star Energy submission category. We have the robust procedures and processes in place to give us the confidence to understand exactly what your project will be eligible for.

This allows our team to focus on other value-add points to get projects the maximum first round rating.

greenstar Recognised Provider.

Our services

Mechanical

It's about comfort not mechanics. We get the solution right from the outset. There really is no project too challenging or too demanding. We thrive on challenges!

Electrical

Electricity is something most of us take for granted. We don't ever really think about it, until of course, we don't have it. At WGE we think differently.

Hydraulics

Buildings are complex structures requiring the skills of many engineering disciplines. Yet there's one discipline that's vital to keeping the whole building operational and the people in that building healthy – hydraulics.

Fire Engineering

Building fires cause millions of dollars of damage each year. The two major causes are electrical fault and human error. That's why the Fire Engineering team at WGE take their job very seriously.

Acoustics

Noise in a building can seriously affect the interactions within and around that space. At work, noise can affect our productivity. At play, noise can affect our ability to unwind, rest and relax. At WGE Acoustics, noise is what we know best.

Fire Protection

We give you peace of mind. Whether you're building a football stadium, a tunnel or a commercial building, protecting people in the event of fire, is an absolute priority.

Sustainability

It's no longer an option to be sustainable, it's an expectation. That's why the companies serious about doing the best they can for the environment are turning to the WGE Sustainability team.

Vertical Transportation

Getting people from A to Z. Whether it's a lift or an escalator at a school, retail precinct, commercial building or a hospital, there's nothing our specialist VT team hasn't tackled.

Underground Power Design

It's more than just power. We're experts at telecommunications and NBN services, urban lighting, solar power lighting, power generation, infrastructure master planning and so much more.

Specialist Lighting

There's no doubt that lighting affects the ambience of a building and its surrounds. A great ambience makes for a positive experience and happy people. That's why it's important to consider the WGE Specialist Lighting team before you start work on your next project.

Property Asset Management

There are plenty of engineering consultants out there willing to give advice. But how do you know if it's the right advice or even the best advice? You look for a team with a great track record and who are highly recommended like the WGE Property Asset Management team.

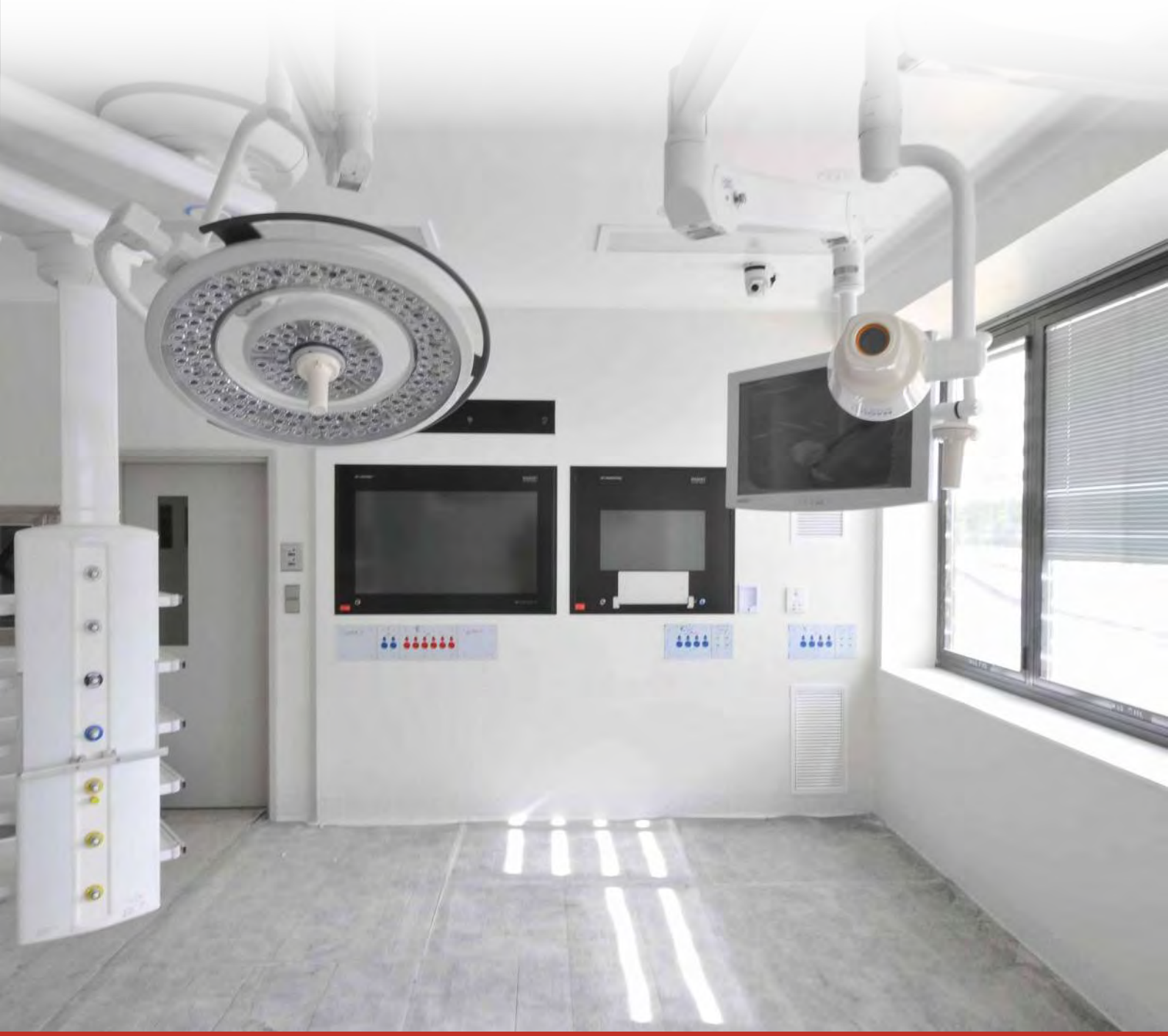
Civil

It's more than just turning dirt. Civil engineering is one of the oldest engineering disciplines in the world and WGE have been practicing it for well over 50 years.

Structural

It's about your vision – we think beyond the structure. Every great design requires a great structural engineering team behind it. No matter how large, complex or unusual your project may be, the hallmarks of a great structural consultant are the ability to deliver innovative, commercially viable and highly buildable solutions.

WOOD & GRIEVE ENGINEERS



To us, it’s more than just work

www.wge.com.au