

4 Proposed Development

4.1 Existing structures

The site for the proposed new Emergency Department is located along Gray Street in an area previously occupied by the Engineering building and brick and metal sheds which were used as a waste disposal area. These buildings have been demolished as part of separate works undertaken to comply with the Health Services Master Plan. Approval for the demolition of the buildings and the replacement buildings has undertaken under clause 58 of State Environmental Planning Policy (Infrastructure) 2007. The Engineering Building is being relocated to a new location off Belgrave Street. The former Waste Management structures were unsightly structures on the Gray Street frontage and these have been moved to a new structure erected behind Griffith House and adjacent to the Animal Hospital.

Additional works to prepare the site involve relocation of a substation and services diversion which do not form part of this application.

At this stage there are no firm plans for the redevelopment of the existing emergency development as further funding is not available. This building will remain in situ until further funding for the health services master plan becomes available.

4.2 Built Form

4.2.1 Design Rationale

The proposed new Emergency Department (ED) facility is a primarily single-storey structure with a partial second storey housing ED office accommodation and plantroom space and located along Gray Street. Detailed Plans and Elevations are attached at **Appendix C**. The necessary size for the facility to serve the district of Kogarah and environs, and the functional necessity that an Emergency Department ideally be located all on the one single street-accessible level, has generated a low large-footprint structure at ground floor level with only minimal elements at first floor level.

Therefore, the profile of the new structure as it will present to the street is long and low, and its vertical scale does not conflict with either housing or fire station built form nearby. Gray Street comprises primarily housing and apartment buildings on its western side, with the hospital itself comprising a substantial presence along its eastern edge between Kensington Street and Short Street. The main ward block of eight storeys is set immediately behind (to the east of) the site of the proposed ED, and to the south of the ED site is the existing four-storey carpark building with helipad on top.

Houses opposite the site (on the west side of Gray Street), are in the main single-storey buildings with pitched roofs. However there is also an apartment block at 39-41 Gray Street of three storeys (with pitched roof), and one at 43-47 Gray Street of four storeys with a flat roof.

The existing Fire Station at the corner of Kensington and Gray Streets is a two-storey structure with pitched roof, and is locally heritage listed.

The design addresses both the hospital master planning initiatives and the preference of the clinical and management staff. The ED is located in close proximity to the hospital main entrance, intensive care unit, operating theatres, ward blocks and helipad. It also has improved links to radiology and close adjacency to the Hospital Main Entrance and public multi-storey carpark.

The Emergency Department main pedestrian entrance is accessed from the entry driveway serving the

existing Main Hospital Entrance, with new drop-off parking positioned at this point and also nearby in Gray Street itself. Undercover access is available between the ED entrance and the Main Hospital Entrance. The new ED will link with the existing hospital through two main links:

- The southern link connects ED to the Main Ward Block lifts and provides covered public access to the main entry to the hospital, which then links to cancer centre and other related facilities. From the Main Ward Block lifts access is afforded and then to the helipad, ICU and Maternity as well as other inpatient units in this block.
- The northern link provides direct access into the Clinical Services Block and via lift to Operating Theatres. This link provides improved access to Radiology as well as direct access to Pathology, and also offers a possible discreet path of travel from PECC to Mental Health Unit. The ED design incorporates a satellite imaging unit in the department including a CT area, to address higher utilisation volumes in the future.

Ambulance access to the department is via a dedicated entrance and ramp off Gray Street. Through detailed consultation and investigation it has been established that NSW Ambulance Service will require eight bays as well as adequate turning capacity and safe movement to support the projected increase in ambulance presentations.

Access from the existing helipad to ED is achieved via the existing overhead bridge from the helipad (atop the multi-storey carpark), then via the main ward block lifts to the direct straight corridor into ED.

Access to transfer point for Mortuary has been discreetly located to the rear of ED, with vehicular access via the driveway to the north, adjacent Kogarah Fire Station.

The emergency department is an essential service needing to be both highly visible and easily accessible. These two design considerations have been made paramount in the design of the facility and have necessitated their overriding other concerns such as reduction of view impacts or obstruction. The building nevertheless has been kept very low in scale (primarily single-storey), with only minor sections of a second storey being provided to house offices for the ED, and plantroom space.

Lack of available site area at the St George Hospital campus meant that options to accommodate the necessarily large ED were very limited. In fact a suitably large site area could only be obtained by demolition of existing structures (maintenance and engineering building). The site area available even then was constrained, and in order to accommodate all the necessary brief requirements, and accommodate them all on a single level to satisfy functional requirements for this type of facility, the design has extended to the property boundary at Gray Street for a substantial extent of its westerly façade. The reasons behind this are further discussed in Section 4.7.3.

Nevertheless an effort has been made to incorporate along this façade some injection of landscaping wherever possible, broadening out to a wider landscaped area to the north of the ED building itself. Given the constrained site and the need to accommodate this extensive facility as much as possible on a single level, setbacks to the street are minimal. Wherever possible however, landscaping along the Gray Street edge has been provided for, and though existing on-site trees will be removed to accommodate the new facility, opportunities will exist to accommodate Council-provided street trees to supplement new on-site landscaping.

The new ED building has been provided with brickwork at ground level, plinth level and up to windowsill level at ground floor, with painted fibre cement cladding above. Face brickwork has been selected to

these areas to reflect existing brickwork of housing and other structures (including fire station) within Gray Street.

A new electrical chamber substation and switchroom will be provided on the Gray Street side of the existing multi-storey carpark building. These will be finished in painted rendered concrete blockwork and the paint finish will match the existing finishes to the multi-storey carpark. The new emergency power generator will be housed in its own acoustically-protected enclosure and this in turn will sit within a fenced area for safety protection.

4.2.2 Solar access

A typical Emergency Department generally does not require windows for the purposes of a view. The concern for staff is more to do with preserving privacy and dignity of patients within, and therefore require few windows only. The main purposes of windows is to ensure there is an awareness of whether it is night or day, and the diurnal movement of sun, and consequent changes in daylight over the day.

On that basis an Emergency Department is designed such that patient treatment bays are clustered around a central staff station for clear sight by staff towards patients in order to monitor their condition. Therefore, with medical services wall-mounted behind the patient treatment bay, much of the 'back wall' behind the patient is occupied with these services, and limits the available space on the wall to accommodate glazing.

Hence the design downplays windows, and though windows do occur on the office level, minimal solar access is provided in keeping with the nature of this facility.

4.3 Operations

The Operational Policy for the St George Emergency Department is provided in **Appendix D**. A summary of the key policy outcomes has been extracted from that policy and is provided below.

The proposed National Emergency Access Targets (NEAT) will aim to have 90% of patients admitted, discharged or referred to another hospital for treatment within 4 hours of presenting to the Emergency Department. These targets will not overrule clinical judgment and will be linked to specific KPIs, funding and reporting. The NSW performance benchmark will begin with a target of 69% for the period January 1st 2012 to 31st December 2012 and increase annual at 7% (i.e) 1 Jan -31 Dec 2013 76.0%, 1 Jan -31 Dec 2014 83.0% and 1 Jan -31 Dec 2015 90.0%.

The Emergency Department (ED) will provide treatment for minor and major trauma cases, medical emergencies for adults and children and a range of other conditions, including surgical, medical, and mental health.

The service will operate under the direction of a full time Medical Director and Nurse Manager. It will provide for the reception, triage and assessment, diagnosis and initial treatment and stabilization of patients that present to the ED.

Major trauma patients are assessed and managed initially in the ED with a coordinated multidisciplinary team approach.

Model of Care:

Patients may present to St George Emergency Department by a number of methods. These include via ambulance (CDA) either as direct response from calls to the ambulance service or as transfers

from other hospitals; via self presentations to the triage station; via helicopter as part of primary or secondary transfers.

All patients presenting to the ED will be assessed by a triage nurse who will best determine where the patient will be initially assessed and treated. This process may occur in consultation with medical staff as required. The triage nurse is a registered nurse with a minimum of 12 months Emergency experience and having undertaken an accredited triage program. This may occur at a central triage station, ambulance reception area or at the bedside. Triage is conducted in accordance with the National Triage Scale, which assigns a numerical code based on the maximum recommended time to review by a health practitioner.

Care may be provided in a number of areas including the resuscitation bays, adult acute care bed, paediatrics, fast track or the consultation rooms and by a multidisciplinary team including medical, nursing and allied health staff.

The resuscitation bays are purpose built treatment bays designed to assess and manage acutely unwell or injured patients. They allow greater access to the patient, continuous monitoring and have specialised equipment to provide advanced life support. They are staffed with dedicated senior medical and nursing staff. Depending on the patient's diagnosis and management plan, they may be transferred to an inpatient area for further treatment eg operating theatre, cardiac cath lab, or they may be stabilised and moved to other areas with the ED for further treatment, observation and review.

The adult acute care beds will provide treatment bays for adult patients requiring a bed in order to provide assessment, non invasive monitoring and treatment. They are staffed with dedicated senior medical and nursing. Early senior medical input will help determine what diagnostic investigations may be required and well as early medical treatment and a disposition plan.

The paediatric precinct will provide care specific to the needs of this group of patients. There will be a dedicated distinct waiting area separated from the general waiting area as well as specific features and facilities designed for Paediatric areas such as cot spaces and play areas. Presentations suitable for a paediatric fast track model will be reviewed within the paediatric precinct. They are staffed with dedicated senior medical and nursing staff.

The Adult Fast Track/Urgent Care area will enable the Emergency Department to operate a "see and treat" model of care with this specific group of patients. These patients will likely require minimal investigations and ideally could be seen and treated within one hour of presentation. Dedicated medical, nursing and nurse practitioner staffing will be required to ensure continuous patient flow during the hours of operation

Patients may be triaged to specific areas within the Emergency Department depending on their needs, such as single rooms for isolation purposes or safe assessment rooms for patients with possible psychiatric presentations. Patients may also be directly referred to in patient units such as the Medical Assessment Unit if specific criteria are met. This process would be aided by the front loading of senior medical staff who can help facilitate this.

The ED will operate 24 hours a day 7 days per week.

4.4 Public Domain

4.4.1 Tree Removal

There are 31 trees that are located within the building footprint and were proposed to be removed. However the Arborist Report attached at Appendix P has recommended that three (3) of these trees - Trees 1, 3 and 12 which are considered highly significant be retained. In response to his recommendations the following actions have been taken:

- Tree 12:** The bin slab has been moved and reconfigured, to avoid affecting the structural root zone of the tree, and as well this adjustment substantially reduces impact on its tree protection zone. On that basis the tree can be retained.
- Tree 3:** The carparking space affecting both structural root zone and tree protection zone has been moved half-a-carpark-space to the west, avoiding affecting the structural root zone of the tree, as well as substantially reducing impact on its tree protection zone. This tree can therefore be retained.
- Tree 1:** This tree extends into driveway area needed for emergency access for Ausgrid maintenance vehicles to backup power generator and substation, and in this case the kerb and levels cannot be altered from the current design. The tree is actually located on Kogarah Fire Stations land and we are in discussions with Kogarah fire station and the arborist to determine whether the tree can be removed or any specific measures can be taken to ameliorate impact on the tree should it need to remain.

At this stage there will therefore be 29 trees removed as a result of the proposal. These trees have not been identified as significant and the recommendations of the Arborist have been adopted as mitigation measures to ensure protection of trees remaining.

4.4.2 Landscape Strategy

Though the site for the new St George Hospital Emergency Department is intensively occupied with new built structure, plus associated accessways for ambulances and for hospital servicing/maintenance and carparking, provision has been made wherever possible to incorporate new landscaping.

Firstly, an intensive landscaped edge along the Gray Street façade at ground level has been provided, mitigating an otherwise hard edge of the building at its interface with the footpath.

At the driveway entrance from Gray Street to the north of the ED structure, broader landscape development with enhanced variety and scale in plantings has been provided.

Wherever else on site that works are contemplated as part of the project, due consideration has been given to incorporating sensitively applied landscaping design. This includes landscaping to the enclosed courtyard area. A Landscape Plan is attached at **Appendix E**.

In selecting trees, shrubs and other planting for the project careful consideration has been given to:

- the use of plantings that are indigenous to the district;
- selection of species that require minimal maintenance;
- selection of species that have minimal watering requirements (e.g. drought-tolerant species);
- compliance with tree and shrub species listings recommended for the area by Kogarah Council.

Species selected are shown below and include:



Cupaniopsis anarchooides;
(Tuckeroo)



Howea forsteria
(Kentia Palm)



Callistemon 'Burgundy Knight'
(Purple Bottlebrush)



Correa reflexa
(Pink Correa)

Figure 11 Landscape Species

4.5 Transport and Accessibility

Cardno has prepared a Traffic and Transport Assessment which describes the proposal and its potential impacts. This report is attached at **Appendix F** and is summarised below.

From a traffic and accessibility perspective, the key changes to the site are:

- Relocation of the Emergency Department (ED) and reconfiguration of the drop off and parking area accessed via Gray Street
- Ambulance access and circulation routes from Gray Street to the ED;
- Reconfiguration of the northern ED carpark
- Access to the electrical infrastructure in this carpark;
- Maintenance of access for deliveries and for arrival and departure of hearses;

4.5.1 Parking

The northern carpark, which is accessed via Gray and Kensington Streets, caters for approximately 23 to 25 vehicles for clinical services and well and two (2) to four (4) vehicles associated with Griffith House. It also contains a number informal spaces previously used for engineering department and service and delivery vehicles. Access to this car park is restricted.

The proposal will result in a reconfiguration of this carpark will cater for 32 cars comprising ten (10) spaces created in a new carpark adjacent to Gray Street and a further 22 spaces behind the new ED building. This new arrangement will allow for an increase in three (3) to seven (7) spaces overall.

The existing ED and Main Hospital drop off carpark will also be reconfigured with an increased capacity from approximately three (3) spaces to around ten (10) and an increase in short term parking from 16 to 22 spaces – an increase of six (6). The table below shows this relationship.

Parking Component	Existing	Proposed
Northern Carpark	2-4 spaces (Griffith House) 23-25 spaces (Clinical Services)	9 spaces (Gray Street carpark) 21 spaces (Main carpark)
ED Drop Off	3 drop off spaces 16 short term	10 drop off spaces 21 short term spaces

Engineering/Service/Delivery	A number of formal and informal service bays and parking spaces	All service/delivery and engineering functions relocated to Belgrave Street
Belgrave Street carpark	44 spaces	0 spaces
Total	69-73 long term spaces 16 short term spaces 3 drop off spaces	30 long term spaces 21 short term spaces 10 drop off spaces

Source: Cardno, 2012

4.5.2 Public Transport

The hospital is located within 350 metres of Kogarah train station and bus interchange and is therefore well located to public transport. Kogarah is located on the Eastern Suburbs line which runs between Bondi Junction and Waterfall/Cronulla with around 13 services to the city running during the morning and afternoon peaks. Services from Bondi Junction vary between 9 and 13 in the morning and after noon peak respectively. These services are high capacity and high frequency.

Similarly bus services at the local bus interchange are frequent and travel to a range of local and further locations. More information is provided in the Cardno report.

4.5.3 Pedestrian Access

There is good pedestrian access to attractions and destinations around the site and local area. These linkages will not be significantly altered with the proposed new ED apart from an additional conflict point where ambulances cross the pavement in Gray Street. The existing ED generates most pedestrian traffic at lunchtime with 106 pedestrian movements during this time. This will relocate to Gray Street and is likely to increase to around 200 movements per hour.

4.5.4 Ambulance operation and access

The new ambulance facility proposed as part of the emergency department is proposed to be accessed via a new driveway from Gray Street approximately 80m south of the Gray Street/Queen Street intersection.

The access has been designed to allow two vehicles to operate independently (i.e. vehicles can enter and leave without impacting on other vehicles entering and leaving at the same time) and is located in accordance with the provisions of the Australian Standard. The access to Gray Street will be designed with a "Keep Clear" zone on the frontage to ensure that vehicles do not queue past and block the access to this component.

The ambulance facility itself has been designed to accommodate eight ambulances including a bariatric ambulance and swept path assessment has been undertaken (refer Cardno report). The location of the ambulance facility on Gray Street (as opposed to Kensington Street) is not expected to have a significant impact on ambulance circulation patterns or trip lengths as shown in the Cardno Report.

The trip lengths increase when travelling from the north via the Princes Highway and the northwest on the opposite side of the rail corridor via Railway Parade (by 440m and 150m respectively), however the trips from the north have the opportunity to travel on the arterial road network at a higher speed which may offset some of the extra time required to cover the longer distance.

Trip lengths decrease when approaching from the south via Gray Street by approximately 280m.

4.6 Water Cycle Management

Due to the constrained nature of the site and the low scale of this proposal, there are no specific water cycle management initiatives being implemented on the project.

4.7 Heritage

The proposal requires the demolition of locally heritage listed “Griffith House”. A Heritage Impact Statement (HIS) has been prepared by Urbis that assesses the impacts of the proposal on the significance of the item. Below is a summary of the report which can be found at **Appendix G**.

Griffith House, erected in 1896, is located at 30 Gray Street adjacent to the Fire station. It is currently occupied for administration purposes and is on that section of the site required for the erection and access to the proposed emergency department. It was purchased by the hospital in the 1960s.



Figure 12 Griffith House (Source: Urbis)



Figure 13 Griffith House (Source: Urbis)

The following summary of the property's history is taken from the report by Urbis.

In 1894, St George Hospital was a “Cottage Hospital”, designed to give fairly limited first aid to those seriously ill or suffering from bodily injuries. It consisted of separated “wards” and was staffed by “nurses” under the control of a “matron”.

By 1914, the St George Cottage Hospital was not only alleviating, but also curing and bringing new life to the district. By 1924 it was a District Hospital, carrying out all these functions and saving lives with its surgical skills. By 1934, it was equal to any district hospital in metropolitan Sydney. By 1964 it was a teaching hospital with specialised departments and known as The St George Hospital. In the late 1980s, following a grant of more than \$200 million dollars, the hospital was to begin its transformation into a world class tertiary teaching hospital, providing the people of Southern Sydney with specialist health care services closer to home.

Over the following years the redevelopment of the physical facilities, expansion of services and acquisition of state-of-the-art technology would be complemented by the recruitment of nationally and internationally recognised staff. This elevation of the clinical standard has been accompanied by an enhanced reputation of the hospital as a teaching facility, resulting in the hospital becoming one of the most popular first preferences amongst graduates of both nursing and medicine as a place of employment in NSW.

In terms of the management structure, The St George Hospital has developed a high sense of organisational maturity, becoming a model for other major teaching hospitals to emulate. With a reduced length of stay for patients, the organisation was also running efficiently. In order to ensure that in becoming more efficient, the hospital could not sacrifice its high standard of care, as the drive towards efficiency has been paralleled by a concentration on quality assurance.

With the completion of the St George Private Hospital next door in 1995, a sense of optimism prevails around the campus that in the future, the presence of both public and private facilities will attract a high calibre of staff and allow the people of the St George District the very best choice in health care services. Medical practitioners will be able to operate out of the one campus, nursing staff will benefit from proposed combined educational opportunities and the commissioning of 300 private beds is expected to improve the availability of beds in the public arena.

4.7.1 Statement of Significance

Griffith House (formerly called Weruna) is a 'late Victorian' building c1890's of local cultural significance.

The building has been strongly associated with the development of Kogarah. It was first owned and occupied by Peter Herrmann, a local identity who was associated with local government and the development of community services including the fire brigade and the St George Hospital.

In 1961 the building's relationship with community services changed from one of proximity and association to one of usage when it was acquired by the St George Hospital and utilised first as a residence for senior hospital medical officers and their families and then for accommodation of Health Promotion and Orthopaedic Early Discharge Units.

The building plays a role in demonstrating the standard of living of local civic leaders around the turn of the century however has been subject to alterations and is in a poor physical condition. (Urbis, 2012, pp12)

4.7.3 Consideration of Alternatives.

During the design of the new emergency department, a number of options were considered to avoid the need to demolish Griffith House. The processes to avoid the demolition are described in summary below.

1. The Emergency Department footprint

- a. *The Clinical Services Plan [CSP] issued by the Ministry of Health in 2006, detailed the number of treatment spaces SGH ED would require to meet the demand projections for ED services up to 2015/16.*
- b. *The CSP was developed into a schedule of accommodation in consultation with health planners, St George Hospital clinical staff and Ministry of Health Statewide Services Development Branch. This resulted in a requirement of in excess of 5000m² for the new Emergency Department, with the clinical spaces all required on ground floor.*
- c. *Over 32 options were considered at a number of locations on the congested St George Hospital campus.*
- d. *A site wide Health Master Plan was commissioned by NSW Health Infrastructure and carried out by Billard Leece Pty Ltd, which confirmed the location on Gray Street as the most suitable location on the campus for the new Emergency Department, notably due to:*
 - i. *The proximity to the Tower Ward Block, providing improved access to Intensive Care Unit [ICU] and ward blocks for admitted patients;*
 - ii. *The proximity to the Clinical Services Building, providing improved links to theatres, nuclear medicine and radiology;*
 - iii. *Much shorter travel distances from the helipad;*
 - iv. *Off street ambulance drop off from Gray Street, with the ability to provide eight (8) off street ambulance spaces, significantly reducing the number of Emergency Vehicles parked on public roads;*

- v. Secure and safe access for mentally ill patients dropped off by the Emergency Services;
- vi. Access to off-street parking [Gray Street Car Park] for emergency drop off and visitor parking;
- vii. The ability to provide public access to the Emergency Department within the hospital campus, in contrast to off the public street.
- e. The conclusion of the Executive Steering Committee and Ministry of Health was the new Emergency Department would be best placed on the Gray Street location.
- f. Given the above, the design team evaluated the following constraints in this location:
 - i. The 7 storey Tower Ward Block and 4 Storey Clinical Services Building to the West
 - ii. The hospitals main access road to the south
 - iii. Gray Street to the East
 - iv. The Fire Station and Griffith House to the north
 - v. A 4000m² + footprint from an agreed Schedule of Accommodation
 - vi. A prescribed model of care which requires specific functional relationships between internal departments to create a functioning Emergency Department
 - vii. Access requirements for any additional levels constructed in a future project, as identified in the master plan
- g. Given the above constraints, a number of options were reviewed by the project team to attempt to avoid the demolition of Griffith House:
 - i. Reduce the GFA of the ED – Not accepted as it would lead to a reduction in treatment spaces, which would result in SGHED not meeting the demand projections for Emergency Care.
 - ii. Create some ED treatment spaces on level 1, which would reduce the Ground Floor area and still retain the total number of treatment spaces. This was not accepted as it would require the transfer of critically ill patients up and down a lift. There is also no precedent for a 2 storey Emergency Department, nor is it recommended by any leading health planners.
 - iii. Relocate the EMU and PECC [the ED units which require the demolition of Griffith House] – Again, this was rejected as it would create a dysfunctional ED, with mentally ill patients having to be admitted to the ED by police through the main hospital building.

2. The access road

The access road is required adjacent to the boundary of the fire station due to the following reasons:

- a. Access is required to the mortuary in the CSB building, for the pick up of bodies
- b. Access is required to the main hospital substation located in the CSB building
- c. Access is required for the safe and secure drop off and pick up of mentally ill patients by the police to the PECC at the rear of the building
- d. Access is required for pathology drop off and pick up for urgent testing of blood samples

The options considered to not build the access road in the location of Griffith House were as follows:

- a. Building a two way road from Kensington Street [between radiology and the research facility]. This is not possible as a two way complaint road is wider than the space currently available, which would require the relocation and demolition of either the radiology department, or the research facility which was not feasible as they are both two storey buildings
- b. Relocating the existing substation, mortuary, pathology and [proposed] PECC to avoid the need for the access road – Rejected as it would create a dysfunctional ED as mortuary, PECC and pathology are all required to be adjacent to the ED.

- c. *Negotiate land purchase with the fire brigade – not feasible as the fire brigade building is also heritage listed.*

An assessment of the impacts of the proposed demolition of Griffith House is addressed in Section 6.11 of this report.

4.8 Services and Infrastructure

4.8.1 Mechanical Infrastructure

A new plant room is required to serve the new department which will be located on the 1st floor in between the two lift shafts. The existing hospital chilled water system has sufficient capacity to serve the new emergency department. Medical gases and oxygen tank are to be located adjacent to the theatre block. An audit of the existing steam powered hot water and heating system has been conducted with a view to decentralise the system to improve energy efficiencies.

The new ED building will be interlinked with the existing central chilled water system for the hospital. Additional heating hot water plant will be provided adjacent to the existing systems serving the tower ward block. Air handling plant will be located in 2 plant rooms at Level 1 of the building, one at each end of the site. Louvres are provided along the facades for both air intakes and clean discharges. Exhaust systems discharge through the roof.

Medical gases for the new building will come from the existing centralised systems created as part of the Service Centre package of works.

4.8.2 Electrical Infrastructure

Electrical power supply to the building will be initially from the temporary kiosk substations located on Gray Street, and then the permanent substation also to be built on Gray Street (this work is not part of this application). The nurse call, security and communication systems will be extended from the existing systems on the campus. External lighting will be in compliance with AS 1158.

4.8.3 Hydraulic and Fire Services

Hydraulic Services

Sanitary drainage and plumbing shall consist of PVC-U pipe and fittings to convey sewer and waste from site fixtures and fittings. The system shall comprise of a series of gravity pipelines and inspection pits/clear-outs that allow direct rodding access. The sanitary drainage system shall discharge and connect to the existing on site 225mm vitrified clay sanitary drainage system. Tundishes shall be located throughout the building for mechanical condensate drains.

The emergency shower will not be connected to sewer and will be provided with a pit with a removable access clear-out for tanker removal. The sanitary fixtures and tapware will be rated as water efficient type (WELS) in order to minimise energy and water costs.

The existing hydraulic services infrastructure serving the existing Emergency Department building has sufficient capacity to supply the new building.

Cold Water Supply

Potable water supply shall be fed from the existing metered 100mm cold water service coming off Sydney Water 150mm water main in Gray Street. The potable supply has existing water filtering to ensure an acceptable high quality of water is maintained to the facility. Materials for water pipe and

fittings shall be copper tube for main lines and polypropylene and cross linked Polyethylene (PEX) for dead leg branch piping.

Potable water will be reticulated to all fixtures, fittings and hose reels. The piping layout will incorporate ring mains where required to ensure continuity of supply. Isolation valves shall be located on the service lines to individual fixtures or group of fixtures in accessible locations at ground level.

Hot water supply

The proposed hot water plant shall comprise of natural gas supplied instantaneous hot water heaters with storage tanks located in the Mechanical Plant room. A flow and return system shall be located to provide a logical distribution throughout the building to maintain thermal efficiencies within the hot water system. Reticulated Natural gas supply shall be provided as fuel for hot water use for the facility. The system shall be extended from the existing system in the main building located in the service tunnel.

The hot water plant will generate 65°C hot water and shall incorporate a ring main flow and return system to reticulate around the building supplying hot water to fixtures as required. RPZD's shall be fitted for zone protection where required by AS3500. Warm water to all patient and staff ablution fixtures will be provided through thermostatic mixing valves located in the wall in a lockable stainless steel box. Branch pipework groups of outlets shall be minimised and dead-legs shall not exceed three metres for 15mm diameter pipe. Each branch shall be equipped with an isolation valve for maintenance purposes located adjacent to the cold water supply branch isolation valve serving the same outlets. Main isolation valves located in the ceiling space shall be kept to a minimum.

Fire Services

An automatic fire sprinkler system consisting of distribution, range piping and sprinkler heads shall be provided to protect the entire building to comply with BCA and AS2118.1. The system shall be extended from the existing system in the main Tower Ward building via the ceiling voids.

An internal fire hydrant system consisting of piping and landing valves generally located in fire exit stairs and elsewhere due to fire compartmentation is being extended from the existing service in the Tower Ward Block to provide coverage to all parts of the building.

Fire hose reels will be supplied from the new fire hydrant service and will be arranged to serve any fire compartment with a floor area greater than 500m². They will be located externally or internally within four (4) metres of an exit. They shall be arranged so that the fire hose will not need to pass through fire or smoke doors. The fire hose reels must be 36 metres in length.

A new fire detection system is proposed as an addressable system for the new ED building. A Sub-FIP (SFIP) will be located to serve the new ED building and connected to the existing MFIP within the Fire Control Room.

To allow investigation of alarms, a delay of up to 3 minutes will be provided to the new SFIP in accordance with AS 4428.1 prior to alarm being raised to the external monitoring station and hence Fire & Rescue NSW.

Portable fire extinguishers shall be provided throughout the building and will be selected, located and distributed in accordance with the BCA and AS 2444.

The new Emergency Department will require a fire hydrant service which will require extension from the existing Tower Block service. This has been agreed with the NSW Fire Brigade.

4.8.4 Sewer and Drainage

Sewer

This sewer main has sufficient capacity to take discharge from the proposed new Emergency Department Building. Sections of existing drainage within the hospital in the vicinity of the proposed ED building may require deviation depending on their depth in relation to the structure.

Stormwater Drainage

Stormwater drainage for the site will be provided generally in accordance with Kogarah City Council's Water Management Policy (2006). These include Kogarah Council's Water Management Policy August 2006, Australian Rainfall & Runoff 1998, Managing Urban Stormwater - Soils & Construction Volume 1 2004 (Landcom), RTA Road Design Guide and Austroads Guide to Road Design standards

The following design criteria have been adopted for design of stormwater drainage systems:

- Drainage of pavement surfaces including gutter flow width and depth 1 in 20 year Average Recurrence Interval (ARI).
- Piped system, including pits generally designed for 1 in 20 year Average Recurrence Interval (ARI).
- Overland flow paths generally designed for 1 in 100 year Average Recurrence Interval (ARI).

The DRAINS software package was utilised to ascertain the flows and hydraulic performance of the existing and proposed stormwater systems.

The proposed ED works will require the adjustment and/or relocation of existing stormwater systems that currently exist within the ED site area. The existing stormwater drainage pipe running north south on the east side of ED will be relocated and upsized to the west side of ED and connected to the existing detention tank located under the main entry off Gray Street. The existing detention tank (approximate storage volume 415m³) has sufficient capacity for this building. The site area currently drains to the existing detention tank and pre developed flows are maintained.

The ED service road that bridges between Gray St and Kensington St has been graded in order to provide continuous fall through to Gray Street and through access for site traffic. The levels of this grading have been dictated to an extent by the required accessible gradients and turning path details for design vehicles including the Franna Crane to access the existing substation as well as the hearses that will be using the service road. Grading the carpark in accordance with the levels designated on the architectural plans resulted in overland flows being conveyed south along the service road to the proposed access area for the hearse. Given this, areas of the carpark and service road have been raised in order to convey overland flows to Gray Street away from the hearse access area and proposed building footprint.

Rainwater sumps, gutters and downpipes will be capable of collecting and disposing of water flows of greater than 1% AEP (1:100 year) rainfall event for a time of concentration of 5 minutes. Provision will be made in the form of a concrete base slab under the ground floor void space to enable the installation of a rainwater storage tank in the future however the storage tank does not form part of this application.

4.9 Waste Management

The South Eastern Sydney Local Health District, of which St George Hospital is part, has an Environmental Management Plan that deals with how all waste is managed. A copy of this Plan is attached at **Appendix H**. The aims of the Waste Management Plan for the storage, handling and transportation of hospital waste are:

- protect public health and safety;
- provide a safe working environment by minimising the risk to employees, as well as patients and visitors;
- minimise waste generation and environmental impacts of waste treatment and disposal; and
- ensure compliance with legislative requirements

Waste streams are listed in the policy along with the appropriate methodology to follow in dealing with each waste stream. The proposed facility is replacing the existing emergency department and while larger, will not deal with any additional waste streams than currently addressed by the plan. There will be no cytotoxic waste or hazardous materials handled in the ED.

4.10 Environmentally Sustainable Development

NSW Health has a comprehensive set of Engineering Services and Sustainable Development Guidelines (TS11), which are intended as a handbook to be used during the briefing and design process. These guidelines have been issued to the design team as part of their brief to ensure a fully compliant design is produced. The key sustainable development objectives outlined in TS11 are:

- comfortable and healthy indoor environment (in terms of thermal comfort, visual comfort and indoor air quality)
- minimised non-renewable resource consumption (e.g. energy, water) and environmental impacts (e.g. greenhouse, other air and water emissions, solid waste), and
- cost-effectiveness over its whole life cycle.

These principles are underpinned by the following sustainable development drivers:

- Government Energy Management Policy (GEMP) objectives of the NSW Government's Sustainability Advisory Council NSW Water Conservation Strategy, and
- NSW Government's Waste Reduction and Purchasing Policy (WRAPP). These principles are endorsed by NSW Health and are to form part of the design development for the works at SGH.

All design consultants are to confirm their adhesion to the principles in TS11.

St George Hospital Emergency Department design has considered the following initiatives for implementation:

- Energy efficiency generally
- Potential use of solar hot water
- Harvesting of rainwater for watering of adjoining landscaped areas
- Minimisation of non-renewable resource consumption
- Minimisation of solar gain in summer and maximisation in winter by careful design of sun shading and the use of insulation as well as technological options such as solar-efficient glass
- Opportunities for day lighting where viable and where the opportunity exists to assist in improving patient well-being
- Use of renewable energy systems
- Use of environmentally sound materials

The plans have been developed with the basic principles of good environmental design recognising southern Sydney's temperate coastal climate. The project will be certified to conform to the BCA requirements (under Part J) for energy management, as well as the specific energy requirements laid down in the health engineering documentation TS11.

5. Director General's Requirements

The following table lists the Director-General's requirements for this development application and Environmental Impact Statement and identifies where these are addressed in this report.

Issue	Location addressed
1. Environmental Planning Instruments (EPIs) Address the relevant statutory provisions applying to the site contained in all relevant EPIs, including: • SEPP (State and Regional Development) 2011; • SEPP (Infrastructure) 2007; • SEPP 33 - Hazardous and Offensive Development; • Kogarah Local Environmental Plan 1998; <i>Permissibility</i> Detail the nature and extent of any prohibitions that apply to the development. <i>Development Standards</i> Identify the development standards applying to the site. Justify any development standards not being met. <i>Contamination</i> Demonstrate that the site is suitable for the proposed use in accordance with SEPP 55 <i>Relevant Policies and Guidelines</i> Managing Land Contamination: Planning Guidelines - SEPP 55 Remediation of Land (DUAP)	Sections 6.1, 6.2 and 6.3
2. Policies, Guidelines and Planning Agreements Address the relevant planning provisions, goals and strategic planning objectives in the following: • NSW State Plan; • Metropolitan Plan for Sydney 2036 and the draft Sydney South Subregional Strategy; • DCP 5 - Kogarah Town Centre; • Council's Section 94 Plans; • Development Near Rail Corridors and Busy Roads - Interim Guidelines 2008; • NSW Groundwater Policy Framework Document - General; and • NSW Groundwater Quality Protection Policy. Detail how the development promotes or is consistent with these provisions and strategic objectives.	Sections 6.4 and 6.3
3. Built Form and Urban Design • Address the height, bulk and scale of the proposed development within the context of the St George Hospital, including how it fits with the schools, residential, commercial and retail uses within the area.	Section 4.2 and 6.5

• Design quality, with specific consideration of the overall site layout, setbacks, axis, vistas and connectivity, open spaces and edges, primary elements, gateways, façade, rooftop, mechanical plant, massing, setbacks, building articulation, materials, choice of colours, landscaping, safety by design, public domain and compatibility with surrounding development. • Consideration to design quality of the two proposed pad mounted substation kiosks to minimise visual impact on the existing streetscape and the front of the Gray Street car park. • Undertake a view analysis, including photomontages and perspectives of; ○ Each elevation; ○ Key elements and views of the development from key locations; ○ Key views, vistas and view corridors from the public domain that may be impacted; and ○ Design considerations to mitigate any impacts	Section 4.2 and 6.5 The sub stations do not form part of this application but are shown on Drawings at Appendix C. Appendix C Section 4.2 Section 4.2
4. Ecologically Sustainable Development (ESD) Detail how ESD principles (as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) will be incorporated in the design, construction and ongoing operation phases of the development <i>Relevant Policies and Guidelines:</i> NSW Health's Engineering Services and Sustainable Development Guidelines (T511)	Section 6.6
5. Amenity Including solar access, acoustic impacts, visual privacy, servicing requirements (including but not limited to, waste management, loading zones, mechanical plant), view loss, overshadowing and wind impacts. A high level of environmental amenity must be demonstrated.	Sections 4.2, 6.7 and Appendix C
6. Landscaping • A detailed landscape plan including the intention of the existing landscaping strip along Gray Street. • Landscaping should be sensitive to encourage patient well being, in accordance with Kogarah City Council's biodiversity and species recommendations. • A detailed arborist report should be submitted that addresses any trees to be removed and any trees affected by the proposal. <i>Relevant Policies and Guidelines:</i> AS 4970 2009 Protection of Trees on Development Sites	Section 6.8 and Appendix E Appendix P
7. Noise and Vibration • Identify the main noise generating sources and activities at all stages of construction, and any noise sources during operation,	Section 6.9 and Appendix M

including the new generator and ventilations system and accumulative impact of all plant and equipment operating simultaneously. Identify effected residential premises and outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land <i>Relevant Policies and Guidelines:</i> NSW Industrial Noise Policy (EPA); Environmental Noise Control Manual (sleep disturbance); and Interim Construction Noise Guideline (DECC) Relevant Australian Standards	
8. Transport and Accessibility (Construction and Operation) - Provide a Transport & Accessibility Study prepared with reference to the NSW 2012 objectives, the NSW Planning Guidelines for Walking and Cycling, the Integrated Land Use and Transport policy package and the RTA's Guide to Traffic Generating Development, considering the following: - Demonstrate how users of the development will be able to make travel choices that support the achievement of relevant NSW 2010 targets; - Detail the existing pedestrian and cycle movements within the of the site and describe the measures to be implemented to promote vicinity sustainable transport and improve access/usage of public transport, pedestrian and bicycle linkages. Address future demand for increased public transport and pedestrian and cycle access; - Assess the implications of the proposed development for non-car travel modes (including public transport use, walking and cycling); the potential for implementing a location-specific sustainable travel plan (eg 'Travelsmart' or other travel behaviour change initiative); and the provision of facilities to increase the non-car mode share for travel to and from the site; - Identify potential traffic impacts during the construction and operational stages of the project, and measures to mitigate these impacts, including the preparation of a Traffic Impact Study; - Daily and peak traffic movements likely to be generated by the proposed development, including the impact on nearby intersections and the need/associated funding for upgrading or road improvement works (if required). The key intersections to be examined include: - Kensington Street and Belgrave/South Street; - Princess Highway and South Street; - Princess Highway and Gray Street; and - Gray Street and Railway Parade. - The traffic impact assessment should consider base models with future traffic generated by the proposed redevelopment;	Section 6.10 and Appendix F

○ Identify and consider any environmental impacts associated with proposed road works, including the proposed closure of any roads associated with the redevelopment of the Hospital on existing vehicle access arrangements (e.g. taxis, community transport vehicles and other vehicles), and measures to mitigate these impacts; ○ Details of the proposed access and service vehicle movements associated with the proposed development including: • details of service vehicle movements including vehicle type and likely arrival and departure times; and • compliance with the requirements of the relevant Australian Standards (ie: turn paths, sight distance requirements, aisle widths, etc.) (note: the new service and ambulance entry / exit should comply with Section 3.2.3 of AS 2890.1:2004); ○ Details of the proposed car parking provisions including: • Proposed number of car parking spaces, opportunity for future parking to be provided within the hospital, provision of short stay off street parking for drop off and pick up of patients (including taxis) and compliance with the appropriate parking codes should be addressed; • Adequate levels of on site car parking for the proposed development, having regard to the level of accessibility of the site to public transport, opportunities for car sharing, local planning controls and RTA guidelines (note: The Department supports reduced parking provisions, if adequate public transport is available to access the site). <i>Relevant Policies and Guidelines:</i> Guide to Traffic Generating Developments (RTA); and NSW Planning Guidelines for Walking and Cycling.	
9. Heritage • A heritage impact statement (HIS) and statement of significance of the likely impacts of the proposal on heritage items, including: ○ the relationship to any heritage items; ○ justification for the removal of Griffith House, including a local comparative analysis to determine the rarity of the item, and whether the building is aesthetically an exceptional building and the structural condition of the item. A discussion of alternative means of access to the facility that does not require the demolition of the building is required; ○ construction and operational impacts on adjoining heritage items;	Section 4.7, 6.11 and Appendix G