

3.0 THE DEVELOPMENT PROPOSAL

3.1 INTRODUCTION

The SGH ASB Redevelopment will provide a modern, contemporary health facility that will address clinical priorities, meet changing clinical needs and provide for expanded activities.

The Project will involve:

- The Acute Services Building (ASB) - approximately 28,500m² of new construction above ED
- Vertical expansion of the multi-level carpark on Gray Street with 128 new car spaces
- Refurbishment of approximately 4,800m² of the existing hospital buildings
- Relocation of helipad facilities

The estimated CIV of the Redevelopment is \$204 million.



FIGURE 14: Rendering of SGH ASB Redevelopment from Gray Street

Source: Jacobs

3.2 SITE PLANNING AND PHASING

The campus wide Master Plan (refer to Figure 15), identifies a need to:

- Immediately expand acute services facilities – the current hospital cannot meet expected growth in acute services demand;
- Co-locate acute services within the ASB to ensure efficient and effective models of care and clinical service delivery – the ASB design integrates the key functions of theatres, ICU/HDU, acute in-patient beds, emergency department, ambulance and helicopter access (together with their support services) in one contiguous facility;
- Allow the future redevelopment of the Hospital – The masterplan allows the continued function of the hospital during future stages, and the next stage once completed will locate the ambulatory zone immediately adjacent to the new ASB, enabling the sharing of the central imaging services, cardiac catheterisation and day surgery and other centralised functions;
- Replace aging infrastructure – though maintained to a serviceable condition, the buildings on the St George campus are beyond their economic life. The campus stock has the lowest rating in the LHD for its asset condition and serviceability;

The following elements of the Master Plan are enabled by the ASB:

- Relocation and expansion of the acute clinical zone including operating theatres and intensive care
- Provision of additional inpatient units
- Creation of future consolidated ambulatory care zone
- Identification of future development zones to accommodate all functions required within the campus (noting the site constraints of the campus are a significant limitation on meeting the growth in clinical services required by the community)

- Creation of a new support services zone for back-of-house services and connections across the campus
- Establishment of a teaching, education and research precinct
- Provision of additional car parking, with pedestrian and vehicular access to meet the needs of the master plan



FIGURE 15: Master Plan Zones

(Source: Jacobs)

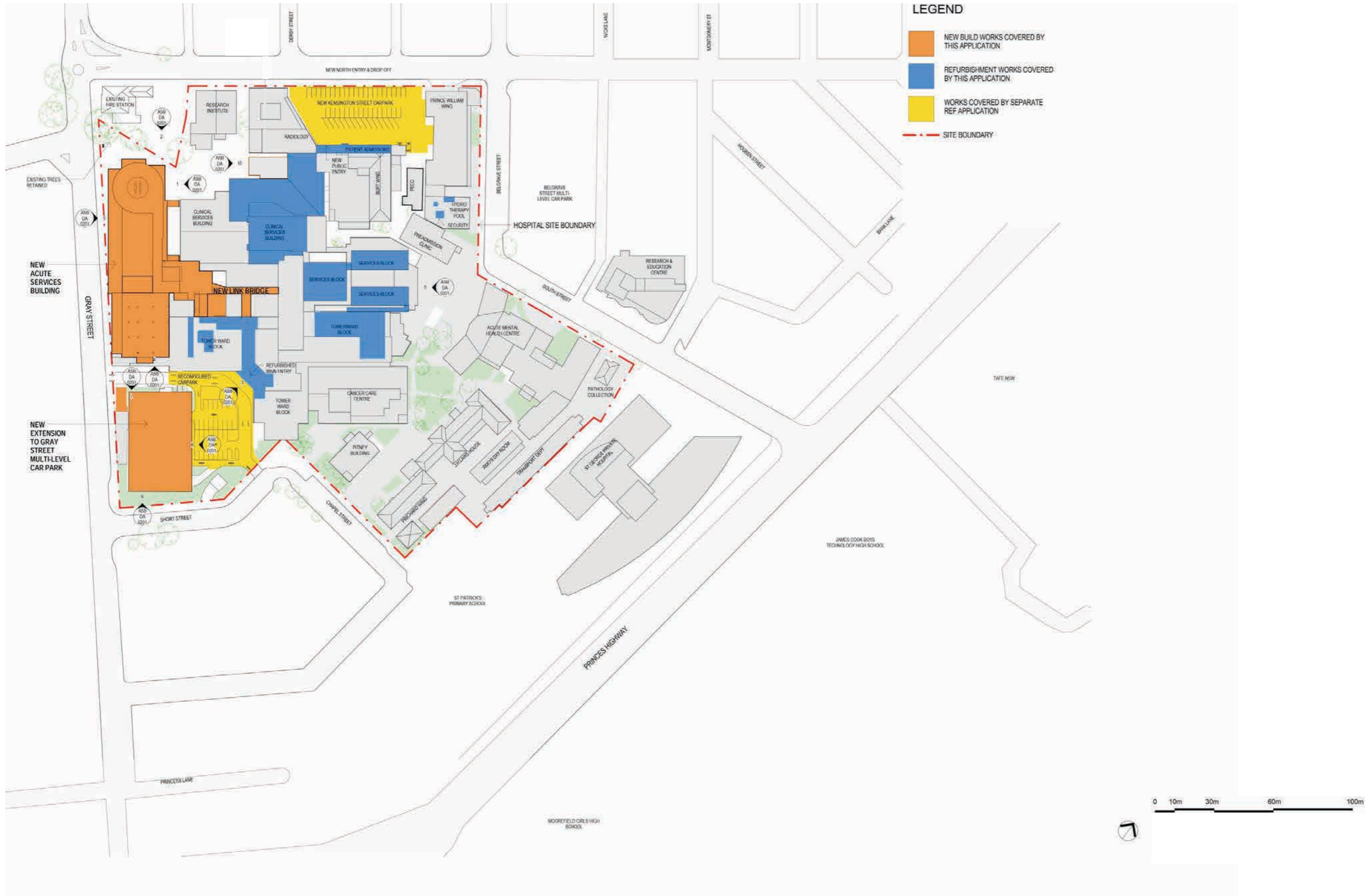


FIGURE 16: Elements of the SGH Master Plan for which approval is being sought

(Source: Jacobs)

3.3 ACCESS

Vehicular Access

Staff and visitors can park nearby in the Gray Street multi-level carpark (which is being extended as part of this project), the Belgrave Street multi-level carpark, or the various on-grade carparks around the hospital campus.

The existing entry road just to the north of the ASB building provides access to the CSB substation, the Psychiatric Emergency Centre at the rear of the new ED building, and access for hearses to the mortuary on the Ground Level of the CSB.

Emergency Ambulance/Access

Ambulance emergency access is via the vehicular entrance way in the Gray Street ED façade. The covered ambulance bay and associated circulation zone are separated from public circulation areas.

Emergency Access to the ASB is via the new ED building.

Emergency egress from the building is via the fire enclosed stairwells at the north and south ends of the ASB.

Emergency Helicopter Access

The existing helipad on top of the Gray Street carpark will be relocated to the rooftop of the ASB. The proposed rooftop helipad will be located on level 9 towards the north of the building which allows the east-west helicopter flight path to remain clear of the existing TWB. It will be used primarily for emergency arrivals and evacuations to

Stage	Year	Peak Parking Demand	Additional Supply	Balance
Stage 2 (interim)	2018 - 2022	212	219	+7
Stage 2 (ultimate)	2022 onwards	352	219	-133

TABLE 03: Future Parking Demand vs Supply (Source: Arup)

other health facilities. A detailed Aviation Report has been prepared by Avipro (refer to Appendix B).

Servicing/Service Vehicle Access

The ASB is generally serviced via the hospital's Service Centre at Ground Level in the middle of the campus. The loading dock facilities are accessed from Belgrave / South Streets.

The ASB is connected to the hospital's Service Centre through the CSB at Ground Level. The extensive loading dock facilities at the Service Centre have been designed with the ASB in mind and service trolleys will be able to move easily between the two buildings on staff-only corridors without any level changes.

Pedestrian and Cycle Access

Public pedestrian access to the ASB is via the main hospital entry on ground Level of the TWB, and is also available via a new pedestrian link bridge at Level 1. Staff-only pedestrian access from the TWB to the ASB is also available via new connecting corridors / pedestrian bridge links at Levels 1, 2, 3 and 4. Staff-only pedestrian access from the CSB to the ASB is available via new connecting corridors / pedestrian bridge links at Ground Level, Levels 1 and 2.

All storeys up to Level 7 are linked by 8 lifts. Two lifts continue to Level 9 servicing the plant and the helipad.

Parking Demand

At present there are over 1,000 carpark spaces in the two multi-storey carparks located in Belgrave and Gray Streets, together with a further 92 at-grade carpark spaces.

Following the scheduled completion of the ASB in 2018, the forecast levels of activity identified in the Transport Assessment Study (refer Appendix C) indicate a ramping up of clinical / support services activity through to 2022 as the range of new facilities are progressively taken up and become fully operational.

The identified parking demand associated with the ASB indicates an initial additional demand of 212 carpark spaces following completion in 2018 progressively increasing by a further demand for 140 additional spaces post 2022.

The assessment has been based on functional briefs for various departments within the ASB and the progressive take-up of new facilities including:-

- Acute overnight beds
- ICU / HDU beds
- Operating theatres
- Procedures room
- Recovery beds

Additional Parking Provision

During the interim development stages associated with the progressive take-up of ASB facilities from 2018, increased demand will be addressed by an additional parking supply of 219 spaces. However, from 2022 onwards, there will be a requirement for a further 133 carpark spaces (refer to Table 02). The additional parking facilities are described below.

Kensington Street At-Grade Car Park

In association with the demolition of the existing ED building on Kensington Street, a new at-grade car parking area is to be constructed. The proposed layout includes provision for 51 at-grade parking bays, including:

- 39 ninety degree parking bays;
- 10 sixty degree parking bays; and
- 2 disabled parking bays.

In addition, 3 parking bays will be allocated to patient transport vehicles.

Gray Street At-Grade Car Park

A reconfiguration of the Gray Street at-grade parking area is being undertaken which will provide 32 parking bays (28 within the at-grade parking area and 4 in the ground floor of the multi-storey car park) for hospital users. This is an increase of 16 spaces relative to the current provision.

Gray Street Multi-Storey Car Park

Following the relocation of the helipad to the top level of the ASB, the Gray Street Multi-Storey Carpark will be expanded by two levels vertically and provide for an additional 136 carpark spaces.

The total additional parking to be provided is set out below.

Parking Facility	Additional Parking Spaces
Kensington Street at-grade car park	51
Gray Street at-grade car park	32
Gray Street multi-storey car park	136
Total	219

TABLE 04: Additional Parking Supply (Source: Arup)

There are a number of key drivers for where departments within the building are located and how they operate together. Some of these are listed below:

Servicing

The ASB will be connected to the hospital's Service Centre through the CSB at Ground Level. The extensive loading dock facilities already completed at the Services Centre have been designed with the ASB in mind and service trolleys will be able to move easily between the two buildings on staff-only corridors without any level changes. The use of staff only corridors is required to keep patients and services separated. The flow on effect of this is the need for a duplicate corridor system with adds to the space requirements on each level.

The ASB design makes provision for bridge links to connect to a future Ambulatory Care building that is being proposed on Kensington Street at Level 2 and all levels above. This approach is necessary to future proof the building to avoid redundancy and maintain efficiency in health delivery. In addition, this will avoid encroaching on the fire station site allowing the future link bridge to exit the ASB from its northern corner into the southern corner of the proposed future building.

All storeys up to Level 7 are linked by 8 lifts. Two of these lifts continue to Level 9 servicing the plant and the helipad. This vertical connectivity is essential to the functioning of the acute services and will allow lifts to be isolated in an emergency to transport patients to ED or theatre as required.

Clinical

The first level above the ED can only be used for functions which do not require substantial services penetrations as the ED must remain functioning during the construction of the ASB above. As a result this floor will be used primarily for offices, meeting or storage space. Some engineering plant is also located on this level.

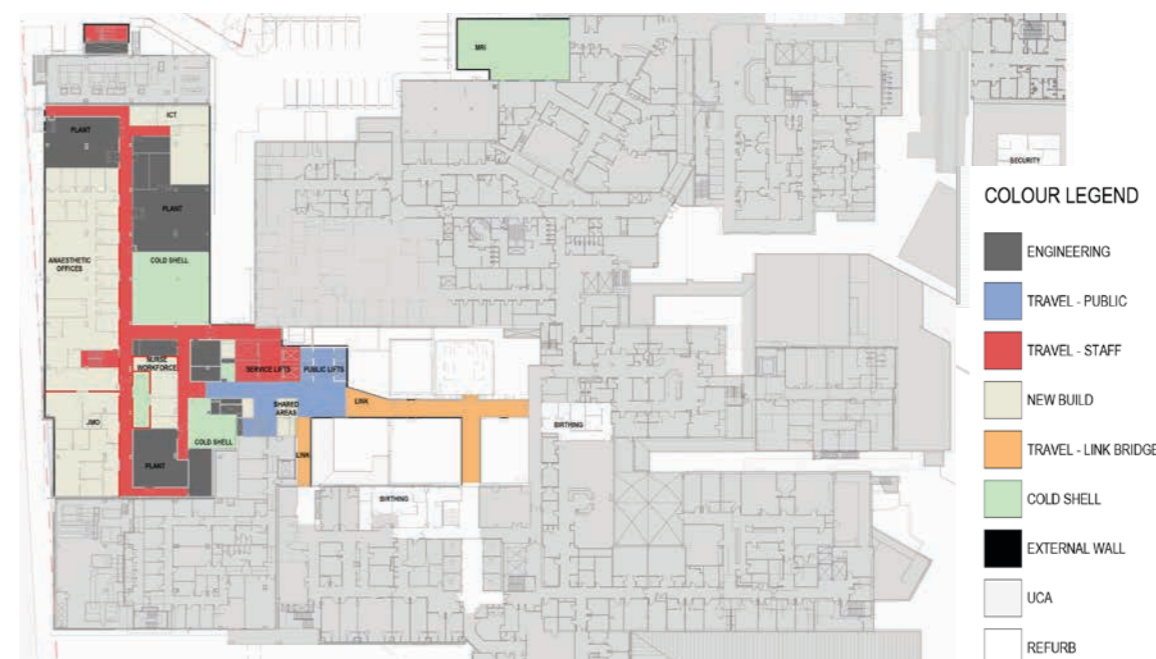
The Operating Surgical Procedure Suite needs to be collocated on the same floor (Level 2) as the existing Operating Suite in the CSB. This ensures that sterile equipment and staff can easily move between the two. Level 3 contains the Sterile Supply Department (SSD). A direct dedicated lift access for distribution and collection of sterile and dirty trolleys to the theatres below is required and therefore these must be adjacent within the CSB and the critical care services above. This also allows the decontamination area, packing area and sterilising area to be segregated and to stop personnel and patient flow and lead to improved infection control.

A dedicated stair connects the Staff Change/Amenities and office areas directly with the Procedural zone on Level 2. Proximity to theatres and acute care for these services is critical to ensure staff can maintain infection control procedures.

Cardiac Catheter Laboratories are located on level 3 with direct access to service lifts and provision to connect to a future Cardiology Unit via a link bridge. Co-location of Cardiac Catheter Laboratories with Emergency, Operating Theatres and Critical Care will enable improved access and transfers through a route that doesn't intersect with any public access for patient safety and privacy.



Ground Level Plan



Level 1 Plan

FIGURE 18: Department Location Plans

Source: Jacobs

The Intensive Care Unit (ICU) is accommodated over two floors. Level 4 includes the administration and support zone while the clinical inpatient zones are configured in two pods on each floor. It is important that these floors are connected by dedicated stair access to:

- Allow improved transfer between ICU and High Dependency Unit (HDU), to avoid the situation where patients may be kept in ICU longer than clinically necessary due to their clinical status, when they could be moved to HDU if transfer was possible. This results in much higher clinical and financial costs.
- Allow improved integration, coordination and networking of critical care services, providing an integrated model of care, whereby a patient receives all the services required in one location.
- Provide ability to change the use of areas based on demand for the service and less movement of patients for better infection control and handover practices.
- Provide increased capacity for isolation.

Level 5 also includes a 24 bed Neurosurgery Inpatient Unit, located as close as possible to the critical care functions.

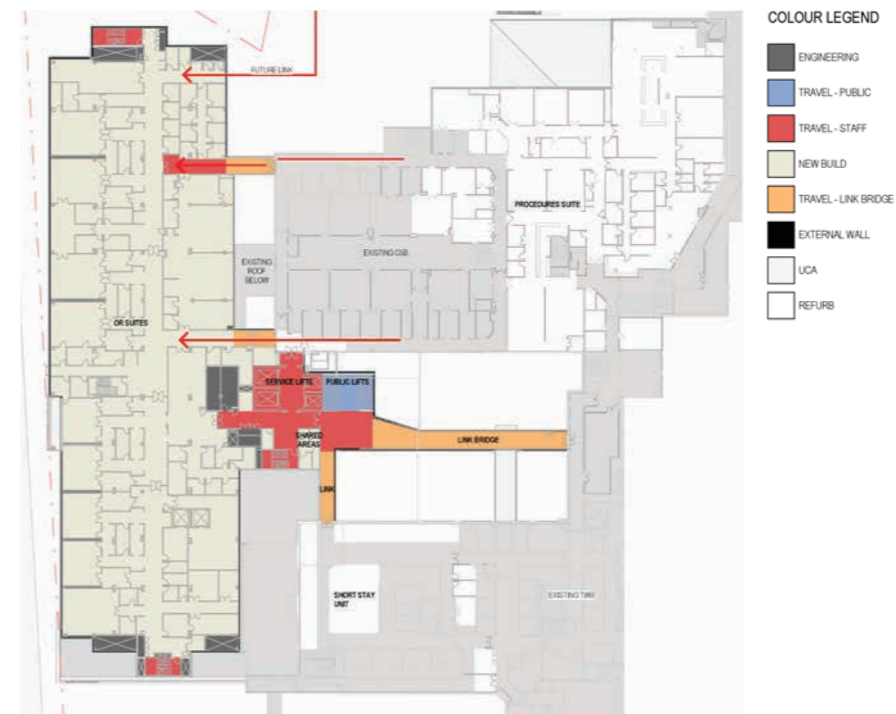
Levels 6 and 7 accommodate identical inpatient units, however as the floor plate of these two levels is narrower, these have had to be configured as 24 and 28 bed units based on the Australasian Health Facility Guidelines. These guidelines establish the space required per patient area, including ensuites etc. They also dictate the requirement for nursing staff to be able to see patient areas which determines the size and location of pods. Both are split into two pods, while a shared zone is located between the two units. This will allow inpatients to be cared for by multidisciplinary teams including nursing /midwifery, medical, pharmacy, allied health and discharge planning staff.

The new IPUs will maximise flexibility to provide improved opportunities to enhance care for a broader range of patients including:

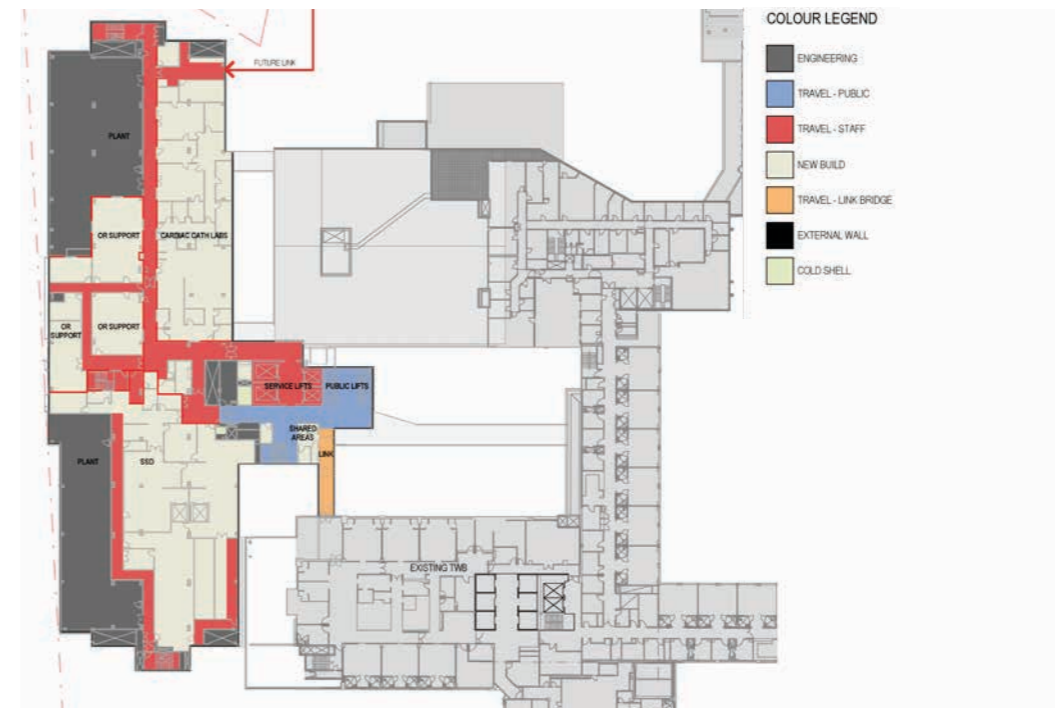
- Speciality Inpatient Units: grouping patients by speciality promotes adoption of best practice in that speciality and supports patient care and staffing models.
- Single rooms: An increased ratio of single rooms will enable best practise infection control, improved management of immunosuppressed patients, and increase the ability to provide patient comfort and privacy.
- Negative pressure rooms: an increase in the number of these Isolation rooms will assist preventing cross contamination and minimise the risk of infecting other patients.
- Special rooms: to improve SGH's capacity to manage with special needs (such as bariatric patients).

All of these IPUs are sized according to the Australasian Health Facility Guidelines.

The rooftop helipad allows the east-west helicopter flight path to remain clear of the existing TWB. It will be used primarily for emergency arrivals and evacuations to other health facilities.



Level 2 Plan



Level 3 Plan

FIGURE 19: Department Location Plans

Source: Jacobs



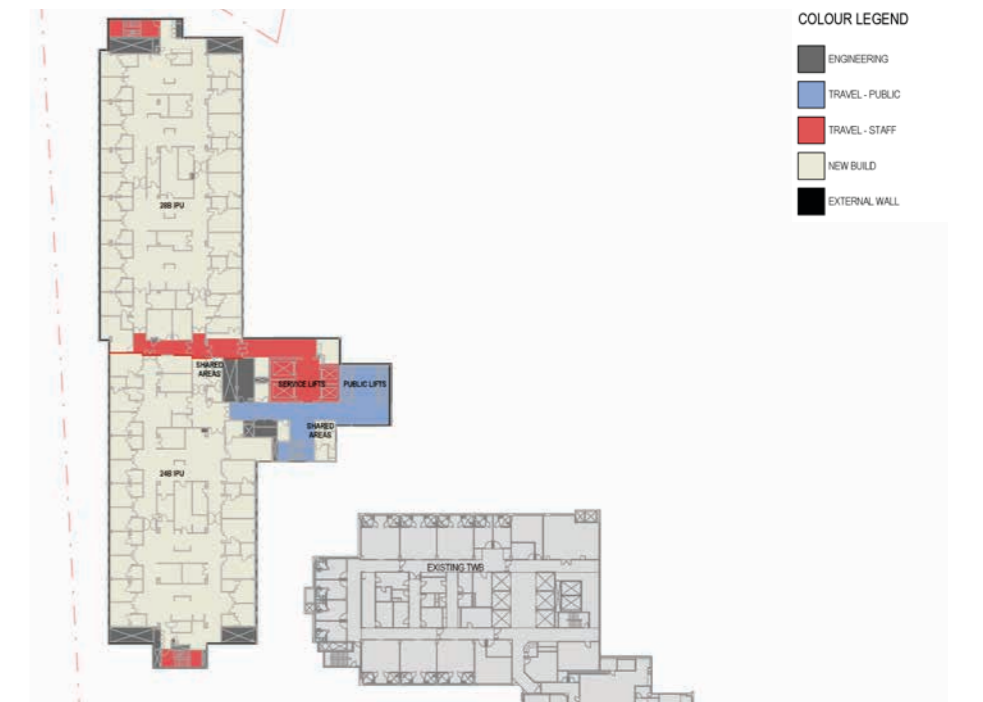
Level 4 Plan



Level 6 Plan



Level 5 Plan



Level 7 Plan

FIGURE 20: Department Location Plans

Source: Jacobs

Architectural Form

The ASB has been designed to be seamlessly integrated with the existing ED building.

The building form has been influenced by the need to construct the tower above the recently completed ED which will remain fully operational during the construction of the ASB. A new lift core will be built in the courtyard to the east of the building.

The architectural form of the ASB has been led primarily by clinical planning considerations. As a complex acute health services facility, the proximity of various services to each other is of prime importance, as demonstrated in the functional design which is summarised below:

Level 9	Helipad
Level 8	Plant
Level 6 & 7	Inpatient accommodation
Level 5 & 4	Intensive car, unit + Inpatient accommodation
Level 3	Catheter Labs and plant serving the operating theatres below including Central Sterilising and Supply
Level 2	Operating theatres
Level 1	Plant and offices (part has already been constructed during the ED works)
Ground Level	Emergency Department

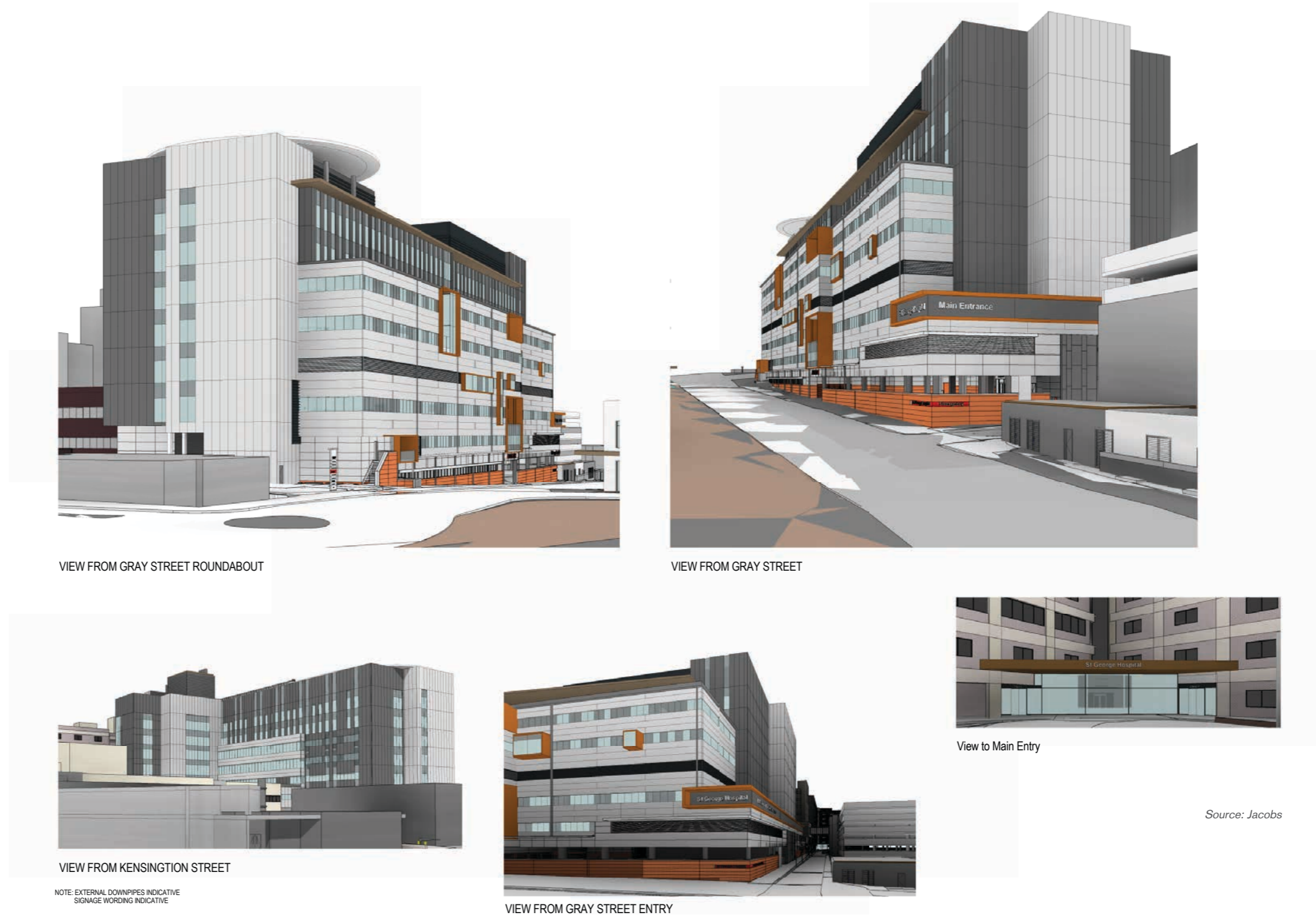


FIGURE 21: ASB Redevelopment 3D Imagery



FIGURE 22: West Elevation Existing

Egress stairs at the north and south ends of the building provide lateral support to the building's structure, and are fully enclosed, forming vertical towers that bookend the ASB.

The roof top helipad is located towards the north of the building which allows the east-west helicopter flight path to remain clear of the existing TWB.

The inpatient floors are shallower in plan than the floors below so that all patient bedrooms receive natural light. Therefore Level 6 and above are set back from the main façade of the building by approximately 8 metres. This is the minimum size floor plate for the IPUs.

The articulated form of the building reflects a range of structural and clinical planning influences. The ICU external terraces in the Gray Street façade of the building are treated as framed openings, providing further variety to the built form.

The pad mounted substation kiosk to the right of the entrance road on Gray Street will be removed as part of these works and replaced with a new integrated chamber substation in front of the multilevel carpark on Gray Street. The external walls of the substation will be constructed and finished to appear as a contiguous extension of the existing substation built as part of the ED works.

Architectural Drawings are provided in Appendix A.

A detailed assessment of the structural options that were investigated for the ASB and the recommended structural system are set out in the Structural Report prepared by Enstruct (refer to Appendix E).

A review of mechanical and vertical transportation requirements covering mechanical services, medical gas requirements as well as vertical transport strategies and ESD principles are set out in the report prepared by Aurecon (refer to Appendix I).

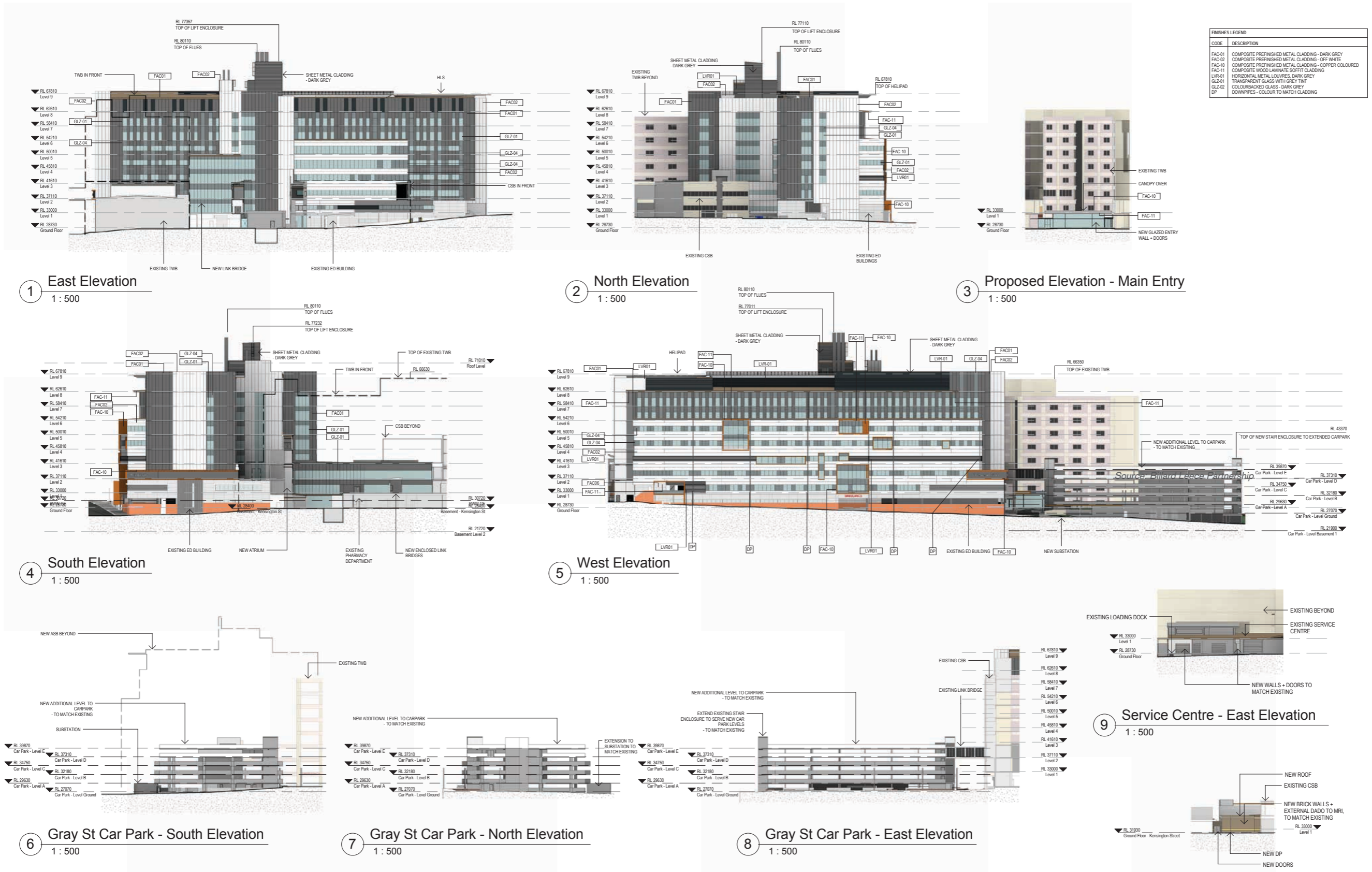


FIGURE 23: St George Hospital Redevelopment ASB Elevations

Source: Jacobs

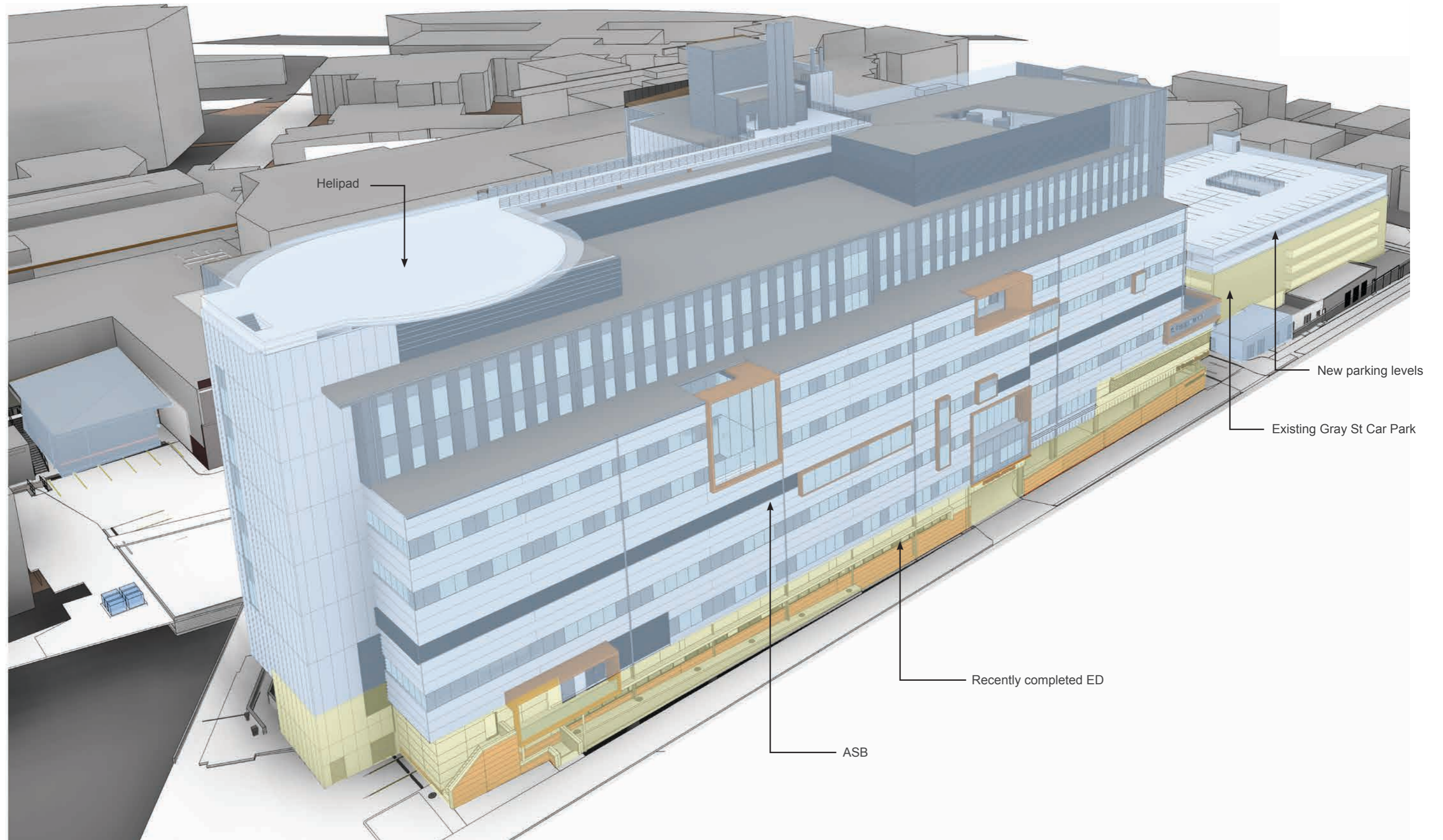


FIGURE 24: St George Hospital Redevelopment Stage 2 Integration

Source: Jacobs

Materials and Finishes

Material selection reflects the following criteria:

Durability and Maintenance

As a significant investment in health infrastructure, the building must be durable. To minimise recurrent maintenance costs, preference has been given to materials that do not require replacement or repainting in the medium term.

Construction

The building needs to be constructed with a minimum of disruption to the fully functioning ED below, the rest of the hospital, adjacent properties and users of Gray Street. The design reflects consideration of the building method and allows speedy assembly, utilising prefabricated elements where feasible, reducing the period of construction and minimising the safety risks associated with working at heights.

Sustainability

Preference has been given to materials that are locally manufactured, recyclable, and have high thermal and acoustic insulating properties. The principal cladding material will be insulated coated steel panels manufactured in Sydney.

Design Context

SGH is adjacent to Kogarah city centre, which has good public transport connections with the rest of Sydney and, like the hospital, is subject to ongoing development pressures. The hospital and city centre have a close, mutually supportive relationship. Building typologies have changed over time from predominantly suburban to more urban environments. Due to the rapid increase in demand for health services, the expansion of the proposed hospital is urban in scale and the proposed facilities have been designed with the aim of creating a high quality urban environment.

In contextual terms the Kogarah townscape exhibits:

- A variety of building styles that together appear more ad-hoc or casual than formal.
- Colour selections that are generally rich and warm.
- Horizontal banding on facades, common to both historic and new buildings (the adjacent Fire Station has deep red brickwork with intermediate natural stone horizontal courses).
- Existing hospital building facades that are a mix of masonry construction, some fairfaced, some rendered and painted (white, beige, pink and deep red). Horizontal and vertical structural elements such as columns and spandrels are articulated with form and colour.

An important part of the response to context is the use of colour outlined separately below.

Identity

Apart from the contextual relationship, the hospital also needs to develop a refreshed identity commensurate with its important role in the community and the prominence of its civic buildings in the urban environment. The nature of a hospital requires it to be welcoming, reassuring, clean and appropriately expressive of contemporary and developing approaches to healthcare. The existing buildings do not adequately fulfil this function being generic, and of little architectural merit. The proposed design of the ASB is intended to reverse this trend.



- FAC-01 Vertical coated steel cladding panel – Dark Grey
- FAC-02 Vertical coated steel cladding panel – Off White
- FAC-03 Horizontal coated steel cladding panel – Off White
- WF-01 Window Frames (Dark Grey)
- FAC-11 Laminated Timber cladding panel with frame formed from composite aluminium
- FAC-10 Frame for LTC-01 formed from composite aluminium cladding panels
- GLZ-01 Glazing, Clear grey tinted with frames to match FAC-01 (Dark Grey)
- GLZ-02 Colour-back glass to match WF-01 (Dark Grey)
- LVR-01 Louvres to match WF-01 (Dark Grey)
- MR-01 Sheet metal roofing to match FAC-02 (Off White)

FIGURE 25: Indicative Colours and Materials Palette

Source: Jacobs

Colour

Colour selection has been carefully considered to address the following issues:

- Identity. The intention of the colour selection is to project an identity for the hospital that is positive, joyful, diverse and inclusive.
- Context. The warm colour treatment of the framed forms on the Gray Street facade relates to nearby buildings, both within the hospital and in the surrounding area, including those with heritage value.
- Massing. Colour is used to articulate the different component forms of the ASB and to 'foreground' and 'background' particular masses. This avoids the perception of the ASB as a monolithic building and promotes its appearance as an assemblage of smaller distinct but compatible forms.

Internal Circulation and Spatial Organisation

The key features of the internal circulation strategy are:

- An Acute Services Building located above the ED on Gray Street with a central vertical circulation core.
- Accommodation of expanded acute 'hot services' in new purpose-built facilities directly above the new ED, including: Perioperative, Birthing/Special Care Nursery, ICU, Surgical and Medical overnight beds.
- A north - south circulation spine or 'Hospital Street', at Level 1 that will link the existing main entry with a new entrance on Kensington Street that has a new drop-off with parking in place of the demolished old ED (these works do not part of this application).
- A new main entry hall in the existing TWB at Ground Level, connected by a new stair to the Hospital Street on Level 1, providing a better identity, better access, and simplified wayfinding.

3.5 REFURBISHMENT WORKS

As existing services are relocated into the new ASB, areas of the existing hospital will be freed up for refurbishment. The refurbishment works include:

- Replacement of the main entry glazed façade and air lobbies including the overhead canopy to improve way finding and access to the existing hospital;
- Refurbishment of the main entrance lobby to the TWB to improve access to the existing hospital;
- The creation of a new Patient Reception Centre directly accessed from the Kensington Street car park;
- Improved public access through the hospital campus to improve service access;
- Expansion and upgrading of the existing kitchen to support the additional services and beds resulting from the ASB Redevelopment project; and
- Expansion of the Services Centre to service the new ASB.

The refurbishment works will not result in any increase in bed numbers beyond those provided by the ASB project, but will support the expansion of health services provided by the ASB.

Refer to Figure 16.

3.6 ECOLOGICALLY SUSTAINABLE DESIGN

Ecologically Sustainable Development (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.

Relevant Policies and Guidelines

The ASB has been designed in accordance with NSW Health's Engineering Services and Sustainable Development Guidelines (TS11)

Safety in Design

Safety in Design Reviews and Workshops have been held for each of the major phases of the project, with the information distributed to all relevant parties. The process aims to:

- Meet the Client's and Users' needs
- Be socially and environmentally sustainable
- Minimise the risk of harm to people
- Minimise the risk of harm to the environment
- Eliminate or reduce risks to constructability, operations, maintenance and decommissioning.

ESD is further discussed in Section 4.7.1.

3.7 DESIGN OPTIONS

NSW Health follows a rigorous approach to the development of its Master Plans, including options analyses and value management studies required by NSW Treasury as part of the business case process.

The ASB location and design resulted from an analysis of current and future clinical needs, functional relationships between services, business continuity, funding, site availability and staging, as well as physical constraints, risks and opportunities.

Once the functions required for clinical services were identified and the extent of required redevelopment determined, meeting those needs was assessed through a detailed analysis of the following options (Table 5):

- Option 1 - Do Nothing.
- Option 2 - Outsource services or change operational practices (non-capital solutions).
- Option 3 - Minimal Capital Investment – minor works only.
- Option 4A - New Acute Services Building in the vacated footprint of the existing ED building on Kensington Street.
- Option 4B - New Acute Services Building directly above the new ED on Gray Street.
- Option 4C - New Ambulatory Care & Primary / Community Health Services Tower in the vacated footprint of the existing ED building on Kensington Street.
- Option 4D - Build the new services on a different site.

The evaluation process resulted in the selection of Option 4B as the preferred option that met the key evaluation criteria, including:

- clinical capacity requirements
- contemporary models of care
- required adjacencies with the new ED

Clinical planning alternatives (blocking and stacking) were subsequently generated, tested and modified as the design team worked with the various clinical teams.

This resulted in an ASB design that met the future requirements of the St George Hospital.

	Pathway	Pros	Cons
Option 1	Do nothing (Keep Safe and Operating)	Lowest initial costs Minimal disruption	Fails to meet clinical requirements. High level of operational inefficiencies and increased recurrent costs.
Option 2	Outsource services or change operational practices (non-capital solutions)	Low capital costs Minimal disruption	High recurrent cost Too much demand for services for them to be met from currently identified alternatives Cannot meet clinical capacity requirements, or achieve contemporary models of care
Option 3	Minimal Capital Investment - minor works only	Low capital cost Minimal disruption	Projected service growth too large to be addressed by minor works alone. Cannot meet all clinical capacity requirements or achieve contemporary models of care. Severely constrained site does not lend itself to 'Minor Works' as an opportunity to significantly expand clinical service priorities.
Option 4A	New Acute Services Building in the vacated footprint of the existing ED building on Kensington Street	Utilises available footprint	Dislocation from the new Emergency Department on Gray Street does not address the required adjacencies. Floor plate size insufficient to meet clinical capacity requirements, or achieve contemporary models of care. Complex staging (Medical Imaging) and ancillary facilities.
Option 4B	New Acute Services Building directly above the new Emergency Department on Gray Street	Achieves clinical capacity requirements, contemporary models of care and operational efficiency. Required adjacency with acute services.	Need to address building above an operating Emergency Department.
Option 4C	New Ambulatory Care Services Building in the vacated footprint of the existing ED building on Kensington Street	Ambulatory services are appropriately located on Kensington Street.	Does not address the Service Statement priorities, achieve clinical capacity requirements for acute care or achieve contemporary models of care. Floor plate size insufficient to meet clinical capacity requirements, or achieve contemporary models of care.
Option 4D	Build the new services on a different site.	Minimum construction disruption to existing services.	No suitable site identified. No adjacency with existing services to be provided at St George Hospital. Requires the highest level of capital funding to initiate. Longest procurement timeframe (land procurement, authority approvals).

TABLE 05: Analysis of Design Options

3.8 CONSULTATION

St George Hospital Staff

Between May and December 2014 presentations to the SGH Staff Forum, Medical Staff Council, and some eighty Concept and Schematic Design user group meetings were held with hospital staff to prepare schematic design layouts, preliminary equipment lists and outline the ICT requirements.

Kogarah City Council / Department of Planning and Environment

Consultation with Kogarah City Council was held in February, October and December 2014 to discuss the impacts on streetscape and car parking as a direct result of the project.

An additional briefing meeting was provided to the Mayor, General Manager and Director, Planning and Environmental Services, in May 2015. Meetings were also held with the Department of Planning and Environment in September and October 2014 and in April 2015 to discuss planning matters arising as a direct result of the project.

Comments provided by Kogarah City Council and Department of Planning and Environment were general in nature and did not necessitate any specific design responses.

Other Authorities and Utilities

During the early design phases, meetings were held with Kogarah City Council, Roads and Maritime Services, Sydney Water, Sydney Airport, Ausgrid, NSW Fire and Rescue and Telecommunications providers.

The utility providers have indicated adequate capacity of existing infrastructure to cater for the proposed ASB development.

Community

The “Kogarah CBD Task Force” established by Kogarah City Council (KCC) represents various organisations based in Kogarah including Kogarah City Council, Westpac Banking Group (St George Bank), St George TAFE, St George Public and Private hospitals, St George Local Area Command and Medicare Local South Eastern Sydney. These organisations represent over 10,000 employees working in the Kogarah CBD. Past meetings of the Task force have noted that ‘the Kogarah Town Centre is a major medical precinct with St George Public and Private Hospitals, Calvary Health Care and numerous other medical facilities servicing the community daily. Kogarah is also home to one of the State’s largest TAFE campuses and two major high schools (one of which is a NSW Selective Secondary School), as well as a major strategic location for the Westpac Banking Group.

At the quarterly task force meeting held on the 1st December 2014, an overview was provided outlining Health Infrastructure’s intention to accommodate a multi-level building and Helipad atop the new ED on Gray Street. It was also noted that the redevelopment planning included expansion for the multi-deck car park infrastructure on Gray Street and additional at grade parking as part of the enabling works. The project was well received and the proposal supported by the Task Force.

Communications regarding the beginning of the Acute Services Building Enabling Works were released and distributed in late October 2014 via a community letter box drop (circa 550 letters) to surrounding residents and businesses.

SACL

The Aviation Report (refer to Appendix B) identifies the need for approval for the proposed changes to emergency helicopter access to the St George Hospital.

Accordingly, discussions have been initiated with SAACL to secure approval under the Airports (Protection of Airspace) Regulations 1996.

The Application will be lodged with the Department of Infrastructure and Regional Development. Such assessments in Sydney are managed by Sydney Airports Corporation Limited, with advice from CASA. This process would have occurred previously as the existing hospital is above the OLS limit. Although the new HLS is at a higher level on the hospital building, the flight paths remain essentially the same and no additional issues are envisaged.

It is noted that the SAACL Application includes approval for the height of the proposed building.

4.0 ASSESSMENT OF ENVIRONMENTAL IMPACTS

This section specifically addresses the following EIS requirements under Schedule 2 of the Environmental Planning and Assessment Regulation 2000:

- (1) *An environmental impact statement must also include each of the following:*
 - (d) *A general description of the environment likely to be affected by the development, activity or infrastructure, together with a detailed description of those aspects of the environment that are likely to be significantly affected,*
 - (iii) *the likely impact on the environment of the development, activity or infrastructure*
- (2) *Subclause (1) is subject to the environmental assessment requirements that relate to the environmental impact statement.*

All other EIS requirements are addressed elsewhere within this report, as indicated on pages vii, viii, ix and x.

The environmental assessment requirements referred to in Clause (2) above were issued by the Secretary on 14 May 2015 and include:

- Statutory and Strategic Context
- Policies
- Built Form and Urban Design
- Environmental Amenity
- Transport and Accessibility
- Ecological Sustainable Development (ESD)
- Heritage
- Noise and Vibration
- Contamination
- Utilities
- Contributions
- Drainage
- Waste

4.1 STATUTORY AND STRATEGIC CONTEXT

The following State Environment Planning Policies (SEPPs) are relevant to the ASB Redevelopment and are considered below.

4.1.1 State Environmental Planning Policy (State & Regional Development) 2011

The aim of this policy is to identify development that is State Significant Development (SSD). Pursuant to the SEPP a project will be a SSD if it falls into one of the classes of development listed in Schedule 1 of the SEPP. 'Hospitals, medical centres and health research facilities' with a capital investment value (CIV) of \$30 million or more are identified as SSD and are considered to be development of State and/or Regional Significance.

St George Hospital ASB Redevelopment has a CIV of \$204 million. A Quantity Surveyors certificate confirming the total CIV of the proposal is attached at Appendix K. Accordingly the project is deemed to be State Significant Development.

4.1.2 State Environmental Planning Policy (Infrastructure) 2007

The aim of this policy is to facilitate the effective delivery of infrastructure across the State, including providing for consultation with relevant public authorities about certain development during the assessment process. The proposed development triggers consultation with the Roads and Maritime Services (RMS) under the provisions of Schedule 3 of the SEPP as the proposed ASB Redevelopment has over 100 beds with access from a Classified Road.

4.1.3 State Environmental Planning Policy No 33—Hazardous and Offensive Development

SEPP 33 - Hazardous and Offensive Development aims to facilitate development defined as hazardous and/or offensive, or potentially so, as defined in the SEPP by ensuring sufficient information is made available to the consent authority to assess whether development is hazardous or offensive, and in doing so impose conditions accordingly, taking into account measures proposed by the proponent to reduce or minimise any adverse impact to human health, life, property or to the biophysical environment.

A Hazards Report has been prepared and is provided in Appendix F. The report concluded that the proposed development is neither a 'potentially hazardous industry' nor a 'potentially offensive' industry. Accordingly SEPP 33 does not apply to the development.

4.1.4 State Environmental Planning Policy No.55 – Remediation of Land

SEPP 55 – Remediation of Land states that land must not be rezoned or developed unless contamination has been considered and, where relevant, land has been appropriately remediated.

Assessment and remediation of the site was undertaken as part of the ED works. The Contamination Assessment undertaken recommended that due to the presence of PAHs and TPHs in BH101, remediation and/or management of this area would be required to meet the requirements of SEPP 55. A remedial action plan (RAP) was subsequently prepared and implemented during the ED works.

4.2 POLICIES

4.2.1 NSW 2021

The NSW State Plan – NSW 2021 was released in September 2012 and is the Government's 10 year plan to deliver the best possible services to the people of NSW.

A key goal of NSW 2021 is to 'Provide World Class Clinical Service with Timely and Effective Infrastructure'.

The St George Hospital ASB Redevelopment contributes to achieving this goal by providing renewed critical infrastructure to meet health demands towards 2021.

4.2.2 Rebuilding NSW – State Infrastructure Strategy 2014

Following a period of extensive analysis and consultation, the Government has fully adopted the recommendations proposed by Infrastructure NSW to deliver this new State Infrastructure Strategy.

This Strategy highlights the importance of sustaining productivity growth in our major centres and our regional communities.

Rebuilding NSW will:

- Reserve \$1.1 billion to invest in the WestConnex northern and southern extensions, and the Western Harbour Tunnel.
- Reserve \$7 billion for Sydney Rapid Transit, to fully fund a second Harbour rail crossing.
- Recognise the importance of sporting and cultural assets by increasing the commitment of a Sports and Cultural
- Fund from \$500 million to \$1.2 billion, capitalising on our existing iconic assets and precincts, and increasing the presence of facilities in Western Sydney.
- Reserve an even greater investment in regional transport of \$4.1 billion, to underpin economic growth across the whole State.
- Reserve \$1 billion for regional and metropolitan schools.

- Reserve \$1 billion for regional and metropolitan hospitals.
- Reserve \$1 billion for water security for our regional communities.
- Reserve \$300 million for regional tourism and the environment.

The ASB Redevelopment is consistent with the recommendations adopted by the strategy regarding health service in terms of the modernisation of health facilities through best practice clinical redesign and the implementation of new models of service delivery.

4.2.3 A Plan for Growing Sydney

The NSW Government released A Plan for Growing Sydney in December 2014. The Plan sets the framework for the Sydney Metropolitan Region for the next 20 years, on issues such as land use, economic development, housing, jobs, transport, innovation, centres, corridors.

The Plan sets the planning context for the provision of suitable health facilities in Sydney. Major health facilities are to be clustered around existing health precincts to improve functioning, knowledge sharing and spatial relationships with other like facilities.

The St George Hospital ASB Redevelopment is located within the existing St George Hospital campus. The surrounding land uses, including the private hospital and independent medical practices and clinics, together with the upgrade of the hospital are consistent with the Plan's objectives of clustering facilities around existing health centres. The site is easily accessed by public transport and is close to major road infrastructure ensuring opportunities for access to employment.

The proposed development is therefore considered to be consistent with the objectives of the Plan and for the specific objectives for the subregion outlined below.

4.2.4 NSW Long Term Transport Master Plan 2012

The NSW Long Term Transport Master Plan sets the framework for the NSW transport system. The NSW Long Term Transport Master Plan will guide the NSW Government's transport funding priorities over the next 20 years, providing the overall framework for how our transport system develops.

Within the Long Term Transport Master Plan, Kogarah is identified as a Health care and social assistance employment area.

4.2.5 Sydney's Cycling Future 2013

Sydney's Cycling Future presents a new direction in the way Sydney plans, prioritises and provides for cycling. This supports the change in culture we are seeing in Sydney with more people choosing to ride a bike for transport.

A bicycle network plan has been developed with council around the Kogarah Centre. It is aimed at better connecting centres with others centres and urban growth areas.

How the SGH ASB will further encourage cycling is addressed in Section 4.7.1 Transport Assessment.

4.2.6 Sydney's Walking Future 2013

Sydney's Walking Future is a policy document which aims to create a culture of walking for transport by promoting walking as a viable and attractive transport choice, especially for getting to and from work and school.

The ASB Redevelopment will encourage walking through the establishment of a green transport plan.

4.2.7 Healthy Urban Development Checklist, NSW Health

The purpose of the checklist is to assist health professionals to provide advice on urban development policies, plans and proposals. It is intended to ensure that the advice provided is both comprehensive and consistent. The checklist is principally about helping to answer the questions:

- What are the health effects of the urban development policy, plan or proposal?
- How can it be improved to provide better health outcomes?

The ASB Redevelopment will have positive health effects by creating capacity to expand high priority clinical services in intensive care, high dependency and cardiac care together with expansion of operating theatres and inpatient units.

4.2.8 NSW Planning Guidelines for Walking and Cycling

The NSW Planning Guidelines for Walking and Cycling exist within a broader policy context which includes the NSW Government's Integrating Land Use and Transport Planning Policy Package and Action for Bikes; the NSW Government's action plan to promote physical activity, Simply Active Everyday and the NSW Bikeplan 2010; and the Commonwealth Government's The National Charter for Integrating Land Use and Transport and The National Greenhouse Strategy.

The Guidelines provide recommendations for improved awareness of the various public and active transport options available at a site (Transport Access Guides) and recommendations for cycle and cyclist facilities.

4.2.9 Development Near Rail Corridors and Busy Roads – Interim Guidelines

The aim of these Guidelines is to assist in reducing the health impacts of rail and road noise and adverse air quality on sensitive adjacent development.

The Interim Guidelines have been considered in detail in respect to the proposal and its location in respect to the rail corridor and Highway. Advice from the Traffic and Transport Consultant is that these Interim Guidelines do not apply to the proposal.

4.2.10 NSW Groundwater Policy Framework Document and Quality Protection Policy

The Goal for the management of groundwater in New South Wales is:

“To manage the State's groundwater resources so that they can sustain environmental, social and economic uses for the people of NSW.”

It is the policy of the NSW Government to encourage the ecologically sustainable management of the State's groundwater resources, so as to:

- slow and halt, or reverse any degradation of groundwater resources;
- ensure long term sustainability of the systems ecological support characteristics;
- maintain the full range of beneficial uses of these resources;
- maximise economic benefit to the Region, State and Nation.

Adoption of the State Groundwater Policy means that the sustainability of groundwater resources and their ecosystem support function will be given explicit consideration in resource management decision making.

A Groundwater Report has been prepared and is provided in Appendix D. While excavation for the lift core may intercept groundwater, the report indicated that this would not significantly affect the sustainability of the groundwater resource or ecosystem.

4.2.11 Draft Sydney South Subregional Strategy

The Draft Strategy identifies Kogarah as a Major Centre and provides direction for the future regeneration of the Town Centre. The actions in the Strategy include the encouragement ...”of residential development within proximity of Kogarah Station and support increased commercial and retail activity east of the rail corridor”. This will impact on the demand for hospital resources. The Strategy also identifies hospitals as magnet infrastructure.

4.2.12 Crime Prevention Through Environmental Design

The guidelines under Section 79C of the EP&A Act 1979 relating to Crime Prevention Through Environmental Design (CPTED) seek to influence the design of buildings and places by:

- Increasing the perception of risk to criminals by increasing the possibility of detection, challenge and capture
- Increasing the effort required to commit crime by increasing the time, energy and resources which need to be expended
- Reducing the potential rewards of crime by minimising, removing or concealing ‘crime benefits’
- Removing conditions that create confusion about required norms of behaviour.

The four key CPTED principles used in assessing crime risk (Department of Urban Affairs & Planning, 2001) are incorporated in the project design:

- Surveillance
- Access Control
- Territorial Reinforcement
- Space Management

The ASB has been designed with the utmost consideration for patient, staff and visitor wellbeing and security. The proposed new SGH ASB project will provide the community with a secure and modern health care facility.

4.3 LOCAL PLANNING INSTRUMENTS AND PLANS

4.3.1 Kogarah Local Environmental Plan 2012

Under the Kogarah Local Environmental Plan 2012 the site is zoned SP2 Infrastructure which has as its objectives:

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure

The zoning map identifies the site as 'SP2 Health Services Facilities'. Within this zone no development is permitted without consent. A number of uses are permissible with consent including:

"Car parks; Child care centres; Community facilities; Depots; Environmental facilities; Environmental protection works; Markets; Places of public worship; Recreation areas; Respite day care centres; Roads; Signage; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose"

The proposed development falls within the health services facility category. Therefore the use is considered permissible with consent. There are no other development standards contained with KLEP (2012) that apply to the site.

Part 4 - Principal Development Standards

Minimum Lot Size

- There is no minimum subdivision lot size applicable to the site.

Height of Buildings

- There is no maximum height applicable to the site.

Floor Space Ratio (FSR)

- There is no maximum FSR applicable to the site.

Part 5 - Miscellaneous Provisions - 5.10 Heritage Conservation

The adjacent Kogarah Fire Station is listed as a Heritage Item under KLEP 2012.

4.3.2 Kogarah New City Plan, 2015

A New Plan for Our City is a Planning Proposal currently on public exhibition. It is in response to the growing population and steadily increasing and shifting demographics

The Plan proposes to create a framework that will deliver housing to meet the needs of Kogarah's current population and the needs of future generations.

Under the New Plan for Our City, the objectives and Planning Controls for the St George Hospital area replicate those defined in the Kogarah Local Environment Plan 2012.

4.3.3 Kogarah Development Control Plan (DCP) 2013

While Development Control Plans do not apply to State Significant Development, the key criteria of the Kogarah Town Centre DCP are discussed below.

Part E1 of the Kogarah Development Control Plan 2013 outlines controls for Kogarah Town Centre. The vision for the Kogarah Town Centre is that:

"The Kogarah Town Centre will be a vibrant urban village providing learning, leisure, living and working opportunities and services (especially medical and healthcare) for residents in the City of Kogarah, the St George Region and the wider Southern Sydney Region."

To preserve and enhance Kogarah's distinctive identity and character, Council's planning and development approval processes will ensure:

- the village atmosphere is maintained and strengthened
- the human scale and people friendly environment is enhanced
- new buildings and streetscapes display a distinctive character
- new development respects and enhances existing items of heritage
- streets and open spaces are safe and attractive for all pedestrians, including people with disabilities
- emphasis is placed on encouraging opportunities for social activities and community celebrations.

Council will build on Kogarah's strengths as a:

- significant transport interchange
- regional employment centre
- regional centre for medical services
- centre for education and learning
- centre for civic and social services
- banking centre.

The DCP identifies St George Hospital as its own precinct. It outlines the desired future character principles for Gray Street as:

"Enhance the poor existing character of car park and blank walls with human scaled, articulated facades and substantial tree planting."

There are no other specific controls contained with the DCP that impact on this development proposal.

4.4 BUILT FORM AND URBAN DESIGN

The SEARs state that the following items must be addressed:

- Address the height, density, bulk and scale, and setbacks of the proposal in relation to the locality and the surrounding development, topography and streetscape.
- Address design quality, with specific consideration of the overall site layout, streetscape, open spaces, façade, rooftop, massing, setbacks, building articulation, materials, colours and Crime Prevention Through Environmental Design Principles.
- Detail how services, including but not limited to waste management, loading zones, and mechanical plant are integrated into the design of the development.

4.4.1 Height

The overall height of the building has been determined by the clinical space requirements set by the Australasian Health Facility Guidelines, as well as the relationship between co-located acute services that are critical for service delivery. Approximately 30,000m² of new construction is needed to accommodate the required health services, utilising the maximum area of each floor (approx. 4,000m²) as determined by the ED footprint (Ground and level 1).

Floors up to level 3 match those of the existing hospital buildings to facilitate patient transfer between health service facilities, especially the existing operating theatres within the CSB which need to be level with the new theatres within the ASB.

From Level 4 upwards, floor to floor heights are based on clinical best practice, i.e. 4.2m for the remaining clinical floors up to and including Level 7.

Level 8 is allocated to services plant and requires a 4.5m clearance. The Helipad and access lifts are required to be the highest point of the building and sit above the plant floor.

The design team was conscious of the need to minimise the visual and solar impact of the building. Design initiatives to reduce apparent height and building bulk are identified in 4.4.2.

4.4.2 Bulk

While larger than the majority of surrounding buildings, the proposed ASB will be of a similar scale to the existing TWB. It will have an important civic function, with high visibility enhancing its function as an emergency destination.

The View Analysis over the following pages includes photomontages showing the existing and proposed views from the following locations:

- Figure 26 - View of ASB from the junction of Belgrave Street and South Street
- Figure 27 - View of ASB site from the north on Gray Street
- Figure 28 - View of ASB site from the south on Gray Street
- Figure 29 - View of ASB site from corner of Short Street and Grey Street
- Figure 30 - View of ASB from the corner of Kensington Street and Belgrave Street



Existing

Source: Jacobs



Proposed

Source: Jacobs

FIGURE 26: View of ASB from the junction of Belgrave Street and South Street



Existing



Existing

Source: Jacobs



Proposed

FIGURE 27: View of ASB site from the north on Gray Street



Proposed

FIGURE 28: View of ASB site from the south on Gray Street

Source: Jacobs

The following actions have been integrated to address apparent building height and bulk of the ASB:

- **Setbacks.** the upper floors are set back from the Gray Street façade so that from the street the building appears lower.
- **Façade articulation.** The façade is articulated.
- **Scale.** The scale of the proposed development is consistent with the context of the SGH, and supportive of the high quality urbanism anticipated for Kogarah city centre's current expansion and densification.
- **Gateway.** The new ASB will become a distinctive gateway, providing a refreshed identity to SGH.
- **Roofscape.** Mechanical plant is integrated within the built form, predominantly at levels 1, 3 and 9. Air intakes and exhausts are integrated with the façade as louvred panels. External cooling towers on the roof at Level 9 will be visually screened by louvres and acoustically attenuated. Flues and exhausts at the top of the building are positioned away from the Gray Street frontage so that their visual impact is reduced.



Existing

Source: Jacobs



Existing

Source: Jacobs



Proposed

Source: Jacobs



Proposed

Source: Jacobs

FIGURE 29: View of ASB from the corner of Short Street and Gray Street

FIGURE 30: View of ASB site from corner of Kensington Street and Belgrave Street

4.5 ENVIRONMENTAL AMENITY

The SEARs state that the following items must be addressed:

- *Detail amenity impacts including solar access, acoustic impacts, visual privacy, view loss, overshadowing, lighting impacts and wind impacts. A high level of environmental amenity for any immediately adjacent residential land uses must be demonstrated, or detailed justification provided where significant impacts cannot be avoided.*

4.5.1 Solar Access

Within the site

The ASB will shade the Gray Street multi-storey carpark and the adjacent on-grade carpark during the afternoon. The existing TWB already overshadows these areas, though the extent will be increased, especially later in the afternoon.

Gray Street

Reviews of solar access options shows that any additional height to the current podium leads to solar access impacts on Gray Street properties. The acute services functions could not therefore be met by lowering the height of the building or changing the footprint of the ASB.

A series of solar access impacts at 21 June have been prepared showing the existing solar access pattern at 21 June at hourly intervals together with the future solar access pattern for the same hourly intervals.

Solar access impacts (existing and proposed) have also been prepared in elevational form for the same timeframes (refer to Appendix M).

Once the ASB is completed, of the 4 multi-residential building sites affected at the winter solstice, 2 would still receive at least 3 hours sunshine per day to 70% of their facades, and 2 would receive less than 3 hours sunshine.

In summary, there will be shadow impacts from the proposed ASB on some existing dwellings and existing residential apartment buildings on Gray Street. Two of the identified apartment buildings will not achieve 3 hours of solar access between 9am and 3pm during autumn/winter nor a number of free standing residential dwellings.

Ocean Street

Solar access impacts have also been identified on properties in Ocean Street. The solar access diagrams in Appendix M indicate that a number of properties will be affected by overshadowing for approximately one hour during the morning period at winter solstice. Accordingly, they will be able to achieve a minimum of 3 hours of solar access between 9am and 3pm.

4.5.2 Privacy

ASB windows primarily face either Gray Street or the CSB. Privacy blinds / venetians will be provided to all bedroom windows in intensive care and the inpatient units on Levels 4, 5, 6 and 7.

4.5.3 Wind

The ASB is to be constructed above the completed ED Building which is effectively a two storey building adjacent to the current Chapel Street entry to the St George Hospital complex.

The ASB will effectively link the existing 8 storey Tower Ward Block and the lower Clinical Services Building into a contiguous eight storey built form structure. Accordingly, the wind impacts generated by the development will be similar to those currently experienced with the present built form.

The refurbishment of the main entrance to the existing hospital will include reconfiguration of the air lobbies which will be designed to prevent excess wind ingress to the foyer area.

4.6 TRANSPORT AND ACCESSIBILITY

The SEARs state that the following items must be addressed:

- *Include a transport and accessibility assessment, which details, but is not limited to, the following:*
 - *the existing and proposed pedestrian and cycle movements within the vicinity of the site;*
 - *an estimate of the total daily and peak hour trips generated by the proposal, including vehicle, public transport, pedestrian and cycle trips;*
 - *the adequacy of public transport to meet the likely future demand of the proposed development;*
 - *measures to promote travel choices that support the achievement of State targets, such as a location-specific sustainable travel plan;*
 - *the daily and peak vehicle movements impact on nearby intersections, with consideration of the cumulative impacts from other approved developments in the vicinity, and the need/ associated funding for upgrading or road improvement works (if required);*
 - *the proposed access arrangements and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and cycle networks;*
 - *proposed car and bicycle parking provision, including consideration of the availability of public transport and the requirements of the relevant parking codes and Australian Standards;*
 - *service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times); and*
 - *traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact.*

- *Relevant Policies and Guidelines:*
 - *Guide to Traffic Generating Developments (RTA)*
 - *EIS Guidelines – Road and Related Facilities (DoPI)*
 - *NSW Planning Guidelines for Walking and Cycling*
 - *Austrroads Guide to Traffic Management Part 12: Traffic Impacts of Development*

4.6.1 Transport Assessment

Site Access

No additional vehicular access points are proposed to service the ASB development. As part of the enabling works for the project, the main entrance forecourt is to be reconstructed to increase parking and provide a two lane vehicular entry. This will improve traffic circulation and increase capacity along the main entry road.

Specific elements of the proposed enabling works include:

- Removal of the existing pedestrian ramp, to be replaced by a DDA compliant footpath (maximum 1:20 grade);
- Creation of two continuous traffic lanes within the site;
- Construction of a raised pedestrian (zebra) crossing;
- Closure of existing southern entry point to Gray Street multi-storey car park;
- Relocation of existing northern exit point from Gray Street multi-storey car park;
- Reconfiguration of existing at-grade car park, increasing parking capacity from 16 to 28 spaces; and
- 4 additional parking bays on the ground floor of the Gray Street car park.
- Construction of the Kensington St Car Park

These works are scheduled for completion between July and September 2015.

Public Transport

As noted previously, the campus is well served by public transport infrastructure, with Kogarah rail and bus interchange located some 500m from the campus. Based on the anticipated levels of activity to be generated by the ASB site, and existing travel patterns, the forecast increase in public transport trips is as follows:

- 25 rail trips in the peak hour; and
- 3 bus trips in the peak hour.

This increase is not considered to be at a level to warrant any additional infrastructure or services, given that existing public transport routes provide high capacity services.

The 2014/2015 NSW Budget allocated \$7 million to undertake detailed planning work on the new Sydney Rapid Transit rail network, including a second Harbour rail crossing. Stage 3 of this network includes planning for an extension of the rapid transit network to Bankstown and Hurstville, servicing Kogarah railway station. Sydney Rail Futures, prepared by Transport for NSW in 2012, notes that “the stations from Hurstville to Wollri Creek will be connected to the rapid transit sector and provide a frequent and rapid connection across to the North Shore and allow up to an additional 10 trains per hour.”

Provision of this enhanced rail network would improve public transport access to the St George Hospital campus and reduce the reliance on private vehicles.

Pedestrians

Future development of the St George Hospital campus provides the opportunity to enhance pedestrian connectivity to key destinations in the surrounding precinct. It will be particularly important to ensure good quality linkages to Kogarah railway station are provided to encourage staff and visitors to travel to the site by public transport. Provision of a legible internal circulation network will play an important role in achieving this objective.

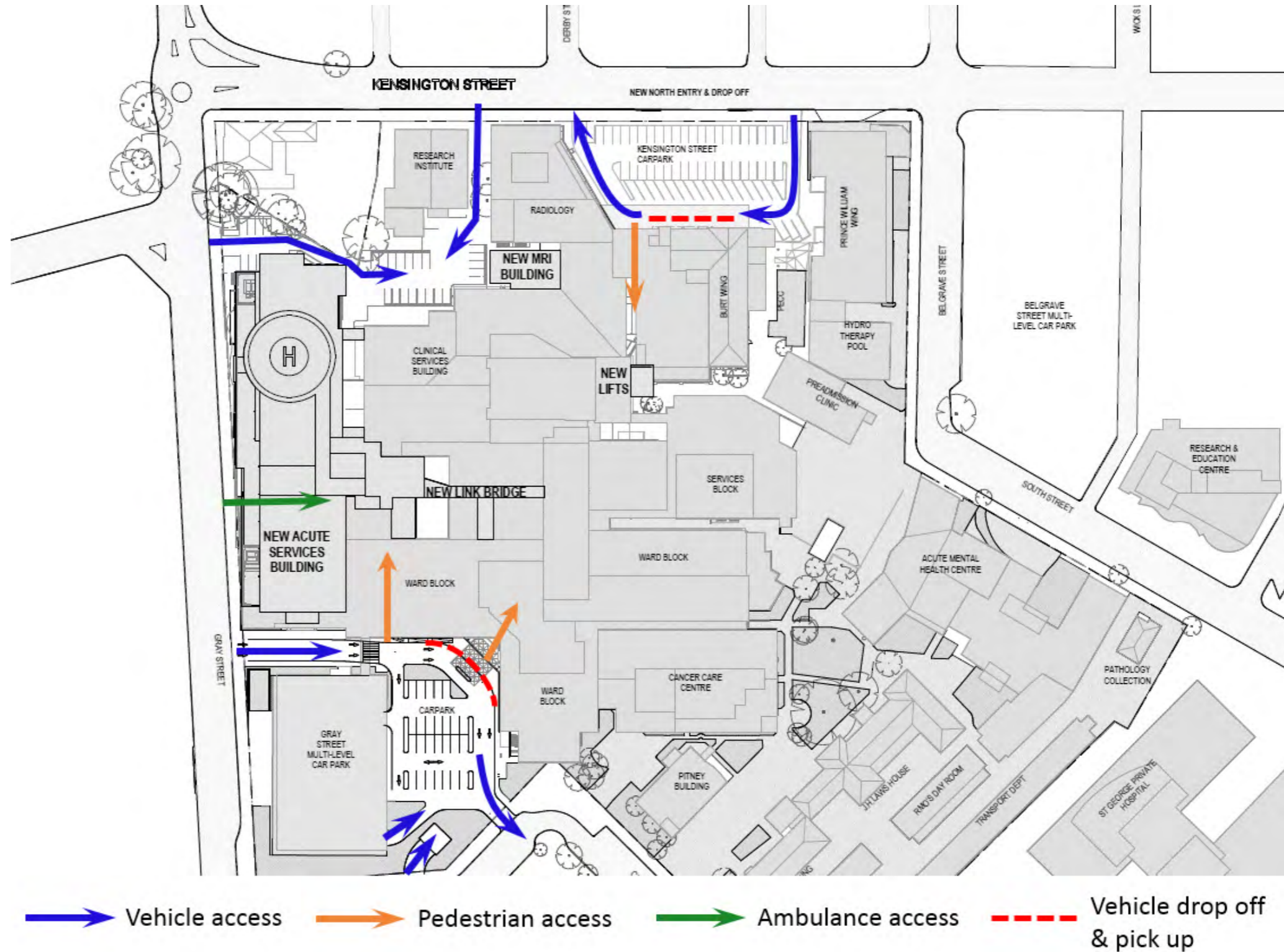


FIGURE 31: Proposed Traffic Circulation

Source: Arup

A key deficiency in the existing pedestrian network is the lack of internal connectivity between the hospital entry points on Kensington Street and Gray Street (main entry). Pedestrians walking from Kogarah station and travelling to the main entry must walk down Gray Street before turning left into the hospital campus.

Future stages of development propose a new pedestrian through site link, providing a legible internal connection between Kensington Street and the main hospital entrance. This new connection will reduce walking times and distances between the campus and Kogarah railway station – improving the attractiveness of public transport as a mode of travel to the site. The new connection will also provide a link to the existing bus stops located on Kensington Street.

The future pedestrian connections will provide appropriate linkages for users of the campus parking north of the railway line and walking to the site.

Traffic Generation and Distribution

Based on the current arrival and departure profiles and forecast levels of hospital activity, the volume of additional traffic movements attributable to the ASB development have been assessed. Refer to Table 6 below.

Time Period	Inbound Traffic	Outbound Traffic	Total Traffic
AM Peak Hour (7.30am - 8.30am)	148	50	198
PM Peak Hour (4.30pm - 5.30pm)	31	177	208
Daily	926	926	1,852

TABLE 06: Forecast Traffic Generation (Source: Arup)

2011 Journey to Work Census data has been utilised to determine the arrival routes of vehicular traffic related to the hospital campus. A number of access routes have assumed to be utilised, as follows:

- President Avenue / Kensington Street: 20%
- Rocky Point Road / Gray Street: 10%
- Princes Highway (west): 25%
- Railway Parade / Gray Street: 10%
- Princes Highway / (north) Regent Street / Montgomery Street: 30%
- Princes Highway (north) / Gray Street: 5%

The departure routes are assumed to be the reverse of the arrival routes, with the exception of those entering at Kensington Street which will turn left from South Street onto the Princes Highway, before turning right onto President Avenue.

Traffic Impacts

The road network performance has been assessed using the RMS approved SIDRA software. Seven intersections in the vicinity of the campus have been assessed. These are:

- Location 1: Princes Highway / Gray Street;
- Location 2: Princes Highway / South Street;
- Location 3: Princes Highway / Kensington Street;
- Location 4: Kensington Street / Montgomery Street;
- Location 5: Kensington Street / Belgrave Street;
- Location 6: Kensington Street / Gray Street; and
- Location 7: Railway Parade / Gray Street;

The analysis indicates the intersections serving the St George Hospital campus typically operate satisfactorily during commuter peak hours. Queues develop on the Princes Highway in both peaks as commuters make their way to and from the Sydney CBD, however these queues generally clear in a single signal cycle. On side streets fronting the Princes Highway (e.g. South Street, Gray Street), vehicle delays can extend up to two minutes due to the long phase times provided to north-south traffic on the highway. Observations however indicate vehicle queues from these side streets would clear over a single cycle.

The Princes Highway / Gray Street intersection was modelled to be operating above its capacity during the PM peak hour. This is largely the result of high southbound traffic flows stemming from adjacent arterial roads such as Rocky Point Road, President Avenue and the Princes Highway. Vehicles departing the hospital campus on Gray Street, particularly those turning right onto the Princes Highway, can experience significant delays as vehicle queues extend back from the upstream and downstream intersections.

The traffic modelling demonstrates little difference in the road network performance due to the traffic increases arising from the proposed ASB development. Changes in vehicle delays are forecast to be relatively minor in both the AM and PM commuter peak hours. All intersections will operate satisfactorily with the exception of Kensington Street / Montgomery Street in the AM peak hour. The remaining intersections are forecast at similar levels to existing, including the Princes Highway/ Gray Street intersection which will continue to operate at Level of Service F.

The Kensington Street / Montgomery Street intersection is forecast to operate at Level of Service F in the AM peak hour following the completion of the ASB development. This is largely the result of a lack of storage capacity on the departure side of the intersection for eastbound vehicles (i.e. Kensington Street east). On-street parking provided on Kensington Street, approximately 10m from the intersection, restricts the flow of vehicles travelling towards the Princes Highway.

To ameliorate the traffic impacts forecast at this location, it is proposed that additional storage capacity be provided by extending the existing no stopping zone by approximately 30m on the northern side of Kensington Street (between Montgomery Street and Moorefield Lane) during peak hours. Implementation of these restrictions will improve the operation of the intersection to Level of Service B (acceptable) following the ASB development.

Parking Impacts

Future Demand

The parking demand generated by the ASB development has been assessed based on the anticipated level of hospital activity (refer to Section 3.3).

It has been assumed that, as a result of measures implemented by the hospital to encourage alternate modes of transport, that 10% of staff, visitors and patients who currently drive to the campus will choose other modes of transport. This is applicable to daytime staff only, with staff arriving after hours to continue to primarily travel by car. This equates to a car mode split for staff of 78% and patients/visitors of 86%.

Based on the above assumptions the anticipated level of parking generated by users of the ASB Redevelopment is summarised below:

- 212 cars in total in 2018; and
- 352 cars in total in 2022

The above numbers include provision for both staff and public users and represent the maximum parking demand generated by the development, which is expected to occur at approximately 11am on a typical weekday. Over the course of the day however, the level of parking demand will fluctuate according to the arrival and departure patterns of staff, patients and visitors.

Car Parking Assessment

A total of 219 additional on-site parking spaces will be provided on the St George Hospital campus. This level of supply marginally exceeds the anticipated level of peak demand initially generated by the ASB development (212 spaces).

From 2022 onwards, the forecast level of peak parking demand will exceed the on-site supply by 133 spaces.

Accordingly, an updated car parking strategy will need to

be considered when the peak parking demand exceeds the on-site supply.

This could include leasing off-site car parking areas in the vicinity of the hospital campus.

There are currently 845 all day, unrestricted parking spaces unoccupied on streets within a 10 minute walk of the campus. The off-site parking balance of 133 spaces represents 15% of these presently unoccupied parking bays. Outside of peak periods, the parking requirements generated by hospital users reduce significantly.

A key factor in mitigating the parking impacts arising from the proposed ASB development is to encourage a greater use of public transport as a mode of access to the campus, particularly by staff.

Travel Demand Management Measures

To complement the parking and traffic strategy, a number of non-infrastructure measures are proposed to better manage staff parking. Management of staff parking is a major issue for hospital campuses across NSW. Staff travel surveys for St George Hospital indicate close to 90% choose to drive to the campus (despite the restricted availability on-site parking). Some of the key factors identified in the travel survey resulting in a high car mode share include:

- Staff working shifts which do not necessarily correlate with periods of good public transport availability.
- Afternoon and night shift staff in particular have concerns about safety and security when travelling to/from work in evenings and/or early morning.
- The reduction in direct train services stopping at Kogarah Station following the Sydney Trains timetable modification in October 2013
- Staff living in areas with poor public transport accessibility

The parking demand assessment completed for the ASB development has assumed a 10% reduction in private vehicle mode share as the traffic and parking

environment surrounding the campus becomes more constrained in future years.

However, there are further opportunities to reduce car dependency to encourage travel to the campus by alternative modes – taking advantage of the site's close proximity to Kogarah rail and bus interchange. These travel demand measures complement the objectives of the NSW 2021 plan to develop an integrated transport system which ensures different transport modes work together so that the interests of the travelling public are put first and will be implemented.

Green Transport Plan

With the numerous transport options available to staff and visitors to access the site, St George Hospital could establish a green transport plan. A green transport plan would incorporate a package of measures to promote the use of public transport, walking and cycling by patrons and employees for travel to and from work and for business related trips. Some specific measures that could be incorporated in this travel plan include:

- Public transport timetables and maps
- Key local walking and cycling routes
- Improvement of current website detailing transport options for both staff and patients
- Establishment of transport information packs to new staff explaining the various ways (other than motor vehicle) of travelling to the site
- Development of a travel plan booklet for staff and visitors
- Liaising with staff, either face to face or via email/ telephone, providing them with advice where needed about travelling to work

Provision of good bus service, complemented with the implementation of a green travel plan will reduce the reliance on private vehicle for St George Hospital staff and patients.

Car Pooling

Staff travel surveys indicate that only a small number of staff who drive to the site carry a passenger with them. Staff demographic information already indicates that a high proportion of staff already reside in the St George area, making the site conducive to potential car pooling programs. This could involve a simple poster on the noticeboard or staff intranet page where staff would register their interest in car pooling by indicating where they live and their shift times.

A website has recently been established (www.hospitalcarshare.com.au) which allows staff members at a number of hospitals across Victoria to connect with each other to encourage sharing a lift to work each day.

The hospital could actively promote car pooling through the creation of a designated parking area where car pool vehicles have a guaranteed space. The area would be controlled so that only car pooling staff can park there. Staff would have to register to a car pool scheme established by the hospital so that they receive a sticker identifying their car as a car pool vehicle.

Renting a Residential Car Space

Land uses within walking distance of the site are typically low to medium density residential dwellings. A communications exercise could be undertaken with local residents to gauge the potential for renting by staff of off-street residential car spaces. Some of these spaces may be vacant during working hours as residents drive their vehicles to other parts of Sydney for work – potentially suiting day shift and/or administration staff. In some circumstances these spaces may be available for longer periods (and therefore potentially attractive to afternoon shift staff).

Bicycle Parking and End of Trip Facilities

No dedicated cycling paths (on road or off road) are located in the streets immediate surrounding the campus. This currently acts as a barrier to increased use of cycling as a mode of transport, particularly by staff. Discussions will be initiated with Kogarah Council to investigate the opportunity to provide dedicated cycle facilities connecting to the campus. An appropriate route would run along Railway Parade and Montgomery Street, providing a connection between the campus and the newly constructed bicycle route (by Rockdale Council) on Rockdale Plaza Drive.

There is currently a small number of dedicated secure bicycle parking spaces, with associated end of trip facilities, provided on the campus on the lower ground floor of the TWB.

Bicycle parking is not proposed as part of the ASB project however once the ASB is operational, there is opportunity to provide bicycle parking within the vacated areas within the existing hospital complex.

Promotion of Public Transport

Despite being located within close walking distance of Kogarah rail and bus interchange, less than 6% of staff currently travel by public transport to the campus. Key reasons for this low public transport mode share, identified by staff in the travel survey, include:

- The reduction in direct train services stopping at Kogarah Station following the Sydney Trains timetable modification in October 2013;
- Takes longer by public transport compared with private vehicle; and
- There is no direct public transport route to/from the hospital

Despite these barriers, there is considered significant scope to increase the proportion of staff travelling to the campus by public transport – particularly administration staff and those working day shifts. Potential measures

that could be introduced to promote greater public transport usage by staff include:

Commence discussions with Transport for NSW to once again provide direct, express train services to Kogarah Station. The timetable changes implemented in October 2013 reduced the accessibility of Kogarah Station. While train services are still provided at 10 minute frequencies during the AM and PM peak hours, passengers are now required to change at either Hurstville or Wollli Creek and travel on an all stops service to Kogarah. Previous train services ran express from Central through Redfern, Sydenham, Wollli Creek, Rockdale and Kogarah. A number of hospital staff noted in the travel survey that they no longer travel by train to the campus for this reason.

4.7 ECOLOGICAL SUSTAINABLE DEVELOPMENT (ESD)

The SEARs state that the following items must be addressed:

- *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 and ongoing operation phases of the development.*
- *Demonstrate that the development has been assessed against a suitably accredited rating scheme to meet industry best practice.*
- *Include a description of the measures that would be implemented to minimise consumption of resources, water (including water sensitive urban design) and energy.*

4.7.1 ESD RESPONSE

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.

While the design of the hospital is not pursuing a formal Green Star rating it has aspired to include and maximise green initiatives where possible and appropriate.

Architectural ESD considerations include:

- Effective use of energy and resources and reductions in ongoing life cycle costs
- Material Selection: Initiatives include recyclable construction materials with low embodied energy and environmentally friendly manufacture, low VOC paints and finishes, sustainable timber, high eco-content for flooring, joinery, ceiling, walls, partitions and loose furniture. Preference has been given to materials that are locally manufactured, recyclable, and have high thermal and acoustic insulating properties. The principal cladding material will be insulated coated steel panels manufactured in Sydney.

- Waste minimisation: Initiatives include a proportion of construction waste to be recycled or reused, provision of a recycling area for management of operational waste.
- Sustainable Procurement by committing to various management measures i.e. environmental management plan, sustainable procurement guide.

In addition to the above, the following measures are to be considered during detailed design:

- Transport:
 - Promoting greater public transportation use for staff and patients by commencing discussions with Transport for NSW to improve accessibility from Kogarah Station by reinstating direct, express train services. Refer to Section 4.6.1.
 - Implementation of a Green Transport Plan.
 - Promoting car pooling through guaranteed car parking provision.
- Water:
 - Water flow monitoring of the main water meter and sub meters to monitor excessive wastage or leakage.
 - Selection of local manufacturers for pipe material and fittings, where appropriate.
 - Minimum 4 star equivalent fixtures and fitting selections (showers minimum 3 star).
- Recycling of the fire test water back into fire water storage tank(s).

4.8 HERITAGE

The SEARs state that the following items must be addressed:

- *The EIS shall include a statement of significance and an assessment of the impact on the heritage significance of any heritage items and/or conservation areas and/or potentially archaeologically significant areas in accordance with the guidelines in the NSW Heritage Manual.*

4.8.1 Heritage Assessment

Urbis was engaged to prepare a heritage impact statement (HIS) for the proposed Acute Services Building (ASB) redevelopment in accordance with the NSW Heritage Manual (refer to Appendix N).

The subject site itself is not a heritage listed item. It is, however, located in the immediate vicinity of the Kogarah Fire Station, which is a locally listed item under Schedule 5 of the Kogarah Local Environmental Plan (LEP) 2012 (Item No. 176) and a state listed item under the NSW Fire Brigade's s.170 Register. Given the proximity, the HIS assessed the potential impacts of the proposed development on the Fire Station.

It was concluded that the proposed works will have no physical impact on the heritage significance of the Fire Station. The proposed development will occur wholly outside of the Fire Station's curtilage, as demarcated by its legal lot boundaries, and will be a vertical addition to the existing Emergency Department (ED) building; with the exception of a fire egress stair to be constructed at the northern side of the ED building and a slight overhang of the upper levels, the footprint of the proposed development will generally not exceed the footprint of the existing ED building. The works will therefore have no physical impact on any of the Fire Station's built fabric.

It was further considered that the proposed works will have only a minimal visual impact on views to the Fire Station, and no impact on views from the Fire Station. In terms of setting, the Fire Station and neighbouring SGH site are located in an area that is characterised by multi-storey contemporary development, particularly in association with the hospital itself. Multi-storey buildings are clearly visible to the rear and south of the building, and form part of the current views and vistas to the Station from the public domain. It was therefore considered that the proposed ASB will present as a relatively sympathetic addition to an area that has already been subject to intensive development on a comparable scale, and which has become increasingly characterised by multi-storey development; the construction of the ASB will not have a significantly greater visual impact on the Fire Station's setting than that of other multi-storey buildings already present in the vicinity.

In terms of views, the proposed ASB will be located to the south of the Fire Station. No significant views or vistas either to or from the Station are currently enjoyed from this southern aspect. In addition to this, the existing setback between the southern elevation of the Station and the ED building will generally be maintained as part of the proposed ASB redevelopment. This setback is considered sufficient to maintain the visual prominence of the Station on its corner site setting, without resulting in any visual impact to the principal, street façades of the building. A fire egress stair, to be located at the northern elevation of the ED building and within this setback, will be of an appropriate scale for the building, and will be an unobtrusive addition to the existing setback; this stair will not significantly impact on the existing setback either physically or visually.

Urbis concluded that:

"The proposed works have been assessed in relation to the relevant controls and provisions of the Kogarah LEP 2012 and Kogarah Development Control Plan 2013, as well as the Heritage Office Guidelines. Based on this

assessment, it is considered that the proposed works will have no physical impact and no significant visual impact on the heritage significance of the Fire Station, and will ultimately provide the greatest amenity for the ongoing use of SGH.

The proposal is therefore recommended for approval."

4.9 NOISE AND VIBRATION

The SEARs state that the following items must be addressed:

- *Identify and provide a quantitative assessment of the main noise and vibration generating sources during construction and operation. Outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land.*
- *Relevant Policies and Guidelines:*
 - *NSW Industrial Noise Policy (EPA)*
 - *Interim Construction Noise Guideline (DECC)*
 - *Assessing Vibration: A Technical Guideline 2006*

4.9.1 NOISE AND VIBRATION ASSESSMENT

Construction noise and vibration impacts are expected to be associated with construction equipment, potential high-impact construction activity or methods, and construction related vehicles (such as, cranes, trucks, generators and the like). Noise during operation phase would be due to the mechanical plant associated with the proposed ASB development.

The nearest potential affected residential premises locations to the ASB redevelopment site of the hospital are to the west of Gray Street and south of Short Street.

Noise

Long term continuous environmental noise surveys will be required to determine whether noise levels during the construction works meet the relevant criteria for construction noise. Periodical attended noise level measurements would allow the determination of any significant noise sources that may impact on the nearby residents as well as indoor acoustic environments within the adjacent hospital buildings. If the noise levels generated by the construction works do impact on the acoustic indoor environments of the adjacent buildings, noise control measures will need to be incorporated for the significant noise sources or, alternatively, administration of work practices will need to be considered.

Vibration

Vibration from construction activities of the project will require routine monitoring and management of construction activities so as not to cause nuisance to users of Emergency Department and other adjoining hospital facilities (i.e. meeting relevant criteria recommended by NSW DEC Assessing Vibration - A Technical Guideline, or equivalent ISO 2631, AS2670), as well as not to cause any structural damage to existing buildings, (i.e. compliance with recommendation by DIN 4150:1999 Part 3 "Structural vibration in buildings – Effects on structures").

As construction works will be performed directly above the emergency department and close to other existing vibration-sensitive hospital facilities, appropriate precautions will need to be taken to limit or avoid potential vibration impacts.

If the human perception criteria presented in NSW Assessing Vibration: A Technical Guideline (AVATG) / ISO 2631 / AS 2670 are exceeded within the hospital building (i.e. wards, laboratory, operation theatre, etc.), then alternative methods of construction will need to

be investigated to complete the works. If an alternative method is not available, negotiated arrangements will need to be employed to allow personnel in vibration critical areas to perform their normal operating duties.

Both noise and vibration surveys should be performed by an independent qualified acoustic consultancy.

Relevant policies and Australian Standards, such as the NSW Department of Environment (INP), NSW Industrial Noise Policy (EPA), Environmental Noise Control Manual (sleep disturbance), NSW Interim Construction Guideline (DECC) and relevant Australian Standards were referenced to address the various components of this DA acoustic study.

With any major construction site there will be noise associated with construction. The management of impacts arising from these activities is now routine practice, both to address impacts to surrounding properties, and for commercial reasons, to limit impacts on nearby tenancies.

The requirement for a noise management plan to be developed prior to works commencing is not uncommon. This should be done once a construction programme and methodology has been determined.

Noise emission goals

The applicable EPA guidelines and standards are:

- “Interim Construction Noise Guideline” which nominates the following objectives for the proposed hours of construction:
 - Within Standard Working Hours (7am-6pm) – background + 10 dB(A).
 - Outside Standard Working Hours – background + 5 dB(A).

In the event that strict compliance with the RPA guidelines can not be achieved - Australian Standard 2436-1981 “Guide to Noise Control on Construction Maintenance and Demolition Site”. The requirements stipulated in Section 3 of the standard will be followed.

Vibration goals

Any construction vibration will comply with the objective in the DECC document “Assessing Vibration – A technical guideline”, with the criteria for intermittent vibration applied.

In addition, consultation will be undertaken with the hospital in the event there is existing vibration sensitive equipment adjacent to the work site (medical imaging equipment or similar). If so – operational and equipment damage guidelines from the equipment manufacturer will be reviewed.

Recommendation

A detailed Acoustic Report has been prepared by Acoustic Logic (refer to Appendix H). Compliance with the identified design goals will ensure that the acoustic performance both within the development and to nearby properties will comply with relevant Australian Standard guidelines as well as NSW EPA and Council requirements.

4.10 CONTAMINATION

The SEARs state that the following items must be addressed:

- *Demonstrate that the site is suitable for the proposed use in accordance with SEPP 55.*
- *Relevant Policies and Guidelines:*
 - *Managing Land Contamination: Planning Guidelines - SEPP 55 Remediation of Land (DUAP)*

4.10.1 Contamination Assessment

The proposed ASB development will be built on top of the existing ED and, accordingly, inground contamination is not an issue.

In a report prepared by CH2M Hill it was indicated that excavation would be required in the courtyard between the Clinical Services Block and the Ward Tower Building. The area was not able to be accessed and the potential for impacted soils to be present in this localised area was flagged. There was reference to a previous report by Environmental Investigation Services which noted elevated concentrations of hydrocarbons, polycyclic aromatic hydrocarbons and benzo(a)pyrene along the western boundary of the ED development adjacent to the courtyard.

It was further noted that the above finding appeared to be an isolated incident, given that the remaining samples drawn from the ED footprint were below detection limits.

It was concluded that there may be a slightly increased risk of contaminated fill in the courtyard area.

In the St George Hospital Site Investigations and Campus Infrastructure Masterplan, Site Investigation / Risk Assessment Report (August 2014) it was concluded that:

“The presence of uncontrolled fill is likely across the Site. Investigations of accessible areas to date have generally indicated that gross contamination is not present. Similarly, the site history does not indicate substantial potential contamination sources on site.”

4.11 UTILITIES

The DGRs state that the following items must be addressed:

- *Preparation of an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation requirements of the development for the provision of utilities including staging of infrastructure.*

- *Preparation of an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.*

4.11.1 Utility Provision

Detailed discussions have been held with the relevant agencies to identify the existing capacity and any augmentation requirements associated with the ASB (refer to Appendix G). Collectively the detailed conclusions set out below represent an Infrastructure Management Plan.

Water

Consultation with Sydney Water has been undertaken to verify the condition, capacity, compliance reliability and efficiency of the existing Sydney Water sewer mains and have found them suitable for the proposed development.

A formal application to Sydney Water will be required after planning approval for Section 73 Certificate Notice of Requirements to confirm exact requirements.

ASB building works will connect to the existing hospital sewer drainage systems provided under previous ED works.

Consultation with Sydney Water has been undertaken to verify the condition, capacity, compliance and reliability of existing water mains infrastructure.

Sydney Water pressure / flow computer model on 25th June 2014 confirmed that water main amplification in Gray Street from 150mm to 250mm is required for fire-fighting purposes, which was supported by Sydney Water as of 3rd September 2014.

Water storage and booster pumps for domestic water and fire-fighting purposes will be provided to ensure adequate water supply security in accordance with industry best practice and NSW Health TS-11 Engineering guidelines.

Water supply provided for domestic purposes will be in accordance with Australian drinking water guidelines. Based on health industry “best” design practice, a centralized, additional water filtration plant is recommended.

Gas

Consultation with Jemena has been undertaken to verify the condition, capacity, compliance reliability and efficiency of the existing Jemena gas mains infrastructure. Jemena has confirmed that the gas mains are suitable for the proposed development.

Formal application to Jemena via nominated gas supply retailer is required to confirm need for existing gas meter and regulator set augmentation.

Existing and proposed hospital gas loads have been assessed and forms the basis for the formal application.

Electrical

The existing power supply to St George Hospital is derived from the Ausgrid 11kV network and provides power to the following sub-station locations:-

- The main indoor CSB chamber sub-station housing 3 x 1500kVA transformers (located at the north-western part of the hospital campus) in the ground floor of the Clinical Services Building.
- The new Gray Street chamber sub-station currently housing 2 x 1500kVA transformers but with the capacity to accept a further 1 x 1500kVA transformer as part of the ASB project. This is located in Gray Street on the western side of the hospital campus just in front of the multi-deck carpark.
- The 1 x 1000kVA kiosk sub-station (located on the corner of Gray Street and Chapel Street) which is providing power supplies to two of the existing chillers Nos. 3 and 4 in the existing Tower Ward

Block. This is a temporary arrangement and will be removed and replaced with a new chamber sub-station as part of the ASB project.

- The 1 x 1000kVA Mental Health kiosk sub-station located behind the St George Private Hospital in South Street.

In addition to the above main campus sub-stations there is also a kiosk sub-station for the Research and Education Building located just off Wicks Lane and a number of individual LV street feeds to the following:-

- Rose Cottage
- Pathology Collection in South Street
- Research and Special Skills Building in Kensington Street

The existing 11kV supply cable from Ausgrid is underground and enters the site from Gray Street (adjacent to the Kogarah Fire Station), connects to the CSB chamber sub-station and then on to the Gray Street chamber and kiosk sub-station locations and then continues both underground and overhead along Gray Street to Princes Highway. The current HV power connection forms an 11kV ring from two separate zone sub-stations but each of the two supplies are not fully rated to accept the total hospital demand. Under the proposed upgrade to the Ausgrid power supply modifications will be carried out to the Ausgrid 11kV infrastructure so that both supplies will be fully rated to accept the electrical power demand for the hospital.

Integrated Water Management Plan

An Integrated Water Management Plan addressing the waste water, potable and non-potable systems for the St George Acute Services Building has been prepared by Acor (refer Appendix L).

4.12 CONTRIBUTIONS

The SEARs state that the following items must be addressed:

- Address Council’s Section 94 Contribution Plan and/or details of any Voluntary Planning Agreement.

4.12.1 Section 94 Plan

Section 94 Contributions Plan No.1 - Road and Traffic Management

This plan applies to all future residential, commercial and retail development involving the addition and conversion of new floor space. Single detached dwelling houses (except when part of a dual occupancy development) are excluded as they are not subject to Section 94 Contributions. Contributions under this plan are not required.

Section 94 Contributions Plan No. 5 - Open Space

While this Section 94 Plan is identified as applying to the land, the proposed development falls within the Kogarah Town Centre and is therefore excluded from the plan on the basis that Section 94 Plan No 8 applies.

Section 94 Contributions Plan No. 8 - Kogarah Town Centre

On the basis that the ASB Redevelopment falls within the Kogarah Town Centre, this Section 94 Plan applies to the Hospital site. The Plan identifies rates of contribution per floor space (net lettable area) for commercial development, including medical floor space. However the plan does not define “medical floor space”. The Plan also provides that:

“Development by the Crown may be considered as providing a public service or benefit where the need for further public facilities and services to be provided by Council may not arise in the usual way. Consequently, Council will consider each Crown development on its merits and where appropriate exempt either partially or fully such development from the requirement to pay Section 94 contributions”

The ASB Redevelopment is clearly providing a public service or benefit by facilitating a higher capacity efficient service to the local and regional population and therefore is exempt from Section 94 Contributions under this Plan.

4.13 DRAINAGE

The SEARs state that the following items must be addressed:

- Detail drainage associated with the proposal, including stormwater and drainage infrastructure.

4.13.1 Drainage Measures

Stormwater

No new measures are proposed to the existing drainage as part of this project. Drainage needs for ASB were implemented as part of ED works. The new building will be tied into the Emergency Department drainage system which has been designed to accommodate the runoff flows.

4.14 WASTE

The SEARs state that the following items must be addressed:

- Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.

4.14.1 Construction Waste

It is estimated that during the construction phase the following materials and estimated quantities will need to be disposed of and or recycled (refer to Table 7).

It is recommended that the following key management processes be followed:

- Site-specific Environmental Management Plan.
- Target 80% of the waste generated during construction to be either reused or recycled. The contractor will be responsible for attaining this percentage (by mass/weight).
- Waste Management Plan (WMP) to reduce construction waste.

4.14.2 Operational Waste

Type of Materials	Estimated amounts	Disposal amounts
General Building Material	34,000 (m ²)	All
Excavation Material	600 (m ³)	All
Bricks	Nil (m ²)	5%, being 0 m ²
Tiles	1,800 (m ²)	5%, being 90 m ²
Structural Steel	1,750 (Tonnes)	Nil
Concrete	5,480 (m ³)	5%, being 274 m ³
Timber	Nil (lm)	5%, being 0 lm
Plasterboard	75,600(m ²)	5%, being 3,780 m ²
Metals	Nil (m ²)	5%, being 0 m ²
Other Waste:	12,200 (m ²)	5%, being 610 m ²
Paints	90,000 (m ²)	5%, being 4,500 m ²

TABLE 07: Materials to be disposed of or recycled during construction phase (Source: Aurora)

Operational waste generated by the ASB will be managed in accordance with the South Eastern Sydney Local Health District's Environmental Management Plan (EMP) and will comply with NSW Health's Waste Management Guidelines for Health Care Facilities Policy Directive 132 updated January 2005.

The EMP provides guidance on the following with regard to waste management:

- Waste stream definitions;
- Labelling and containment;
- Handling and storage;
- Waste collection; and
- Waste management strategies.

Waste streams likely to be generated during operation include:

- Clinical Waste
- Cytotoxic Waste
- Pharmaceutical Waste
- Chemical Waste
- Recyclable Products
- Organic Products
- Liquid Waste
- General Waste

The proponent will further quantify and classify these likely waste streams prior to ASB becoming operational. Measures to manage, reuse, recycle and safely dispose of waste generated by the ASB will be implemented in accordance to the methodologies identified in the above plan and policy. The proposed ASB is expanding existing infrastructure and while larger will not deal with any waste streams that are not addressed by the plan.

4.14.3 SEPP 33 Assessment

As part of the St George Hospital (SGH) Stage 2 Redevelopment, a new Acute Services Building is to be constructed above the existing Emergency Department. A State Environmental Planning Policy No. 33 (SEPP 33) risk screening assessment has been prepared to address the requirements of the St George Hospital Stage 2 Redevelopment Environmental Impact Statement (EIS).

An initial risk screening process outlined in the Applying SEPP 33 Hazardous and Offensive Development Application Guidelines documentation has been utilised to determine whether the nature of the development is considered potentially hazardous and 'potentially offensive'. Based on information from stakeholders the nature and quantities of dangerous goods proposed to be stored in the ASB Redevelopment will not be excessive or adversely impact the existing facilities and the overall site. Notwithstanding the nature of the proposed storage, a SEPP 33 risk screening assessment has been undertaken for the entire SGH site.

The proposed storage, usage and management quantities of hazardous materials at the SGH site are outlined in the attached report (Appendix F). In summary, the materials consist of various Class 2.1, 2.2, 3 PG II, 3 PG III and C1 products and have been assessed against the threshold limits outlined in SEPP 33. As the threshold limits are not exceeded, no further measures are required to be implemented to manage hazards and risks associated with the storage.

The storage of equipment and associated radiation hazards related to medical imaging, including x-rays, nuclear scans and radiation oncology are not included in the list of hazardous materials provided by the Dangerous Goods Consultant. These materials are assumed to comply with relevant Australian Standards.

Based on the Dangerous Goods currently stored on site (information provided by All Areas Dangerous Goods Consultants), there are no exceedances of the threshold limits under the provisions of SEPP 33. Completion of the SEPP 33 screening assessment shows that the St George Hospital Stage 2 development is not considered to be potentially hazardous based on the dangerous goods stored and therefore no further assessment is required.

5.0 MITIGATION MEASURES

This section specifically addresses the following EIS requirements under Schedule 2 of the Environmental Planning & Assessment Regulation 2000:

- (1) *An environmental impact statement must also include each of the following:*
- (d) *an analysis of the development, activity or infrastructure, including:*
 - (iv) *a full description of the measures proposed to mitigate any adverse effects of the development, activity or infrastructure on the environment*
 - (e) *a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d) (iv).*

The following provides a summary of environmental impacts identified in Section 4.0 and the proposed mitigation measures to be implemented.

5.1 BUILT FORM AND URBAN DESIGN

The built form of the ASB broadly matches the scale of the existing TWB and the CSB.

The built form has been carefully modulated and steps back from the Gray Street frontage at the upper levels thus reducing the apparent bulk and scale of the building.

The selection of colour and materials takes into account the building articulation and the built fabric relationships with Kogarah Centre.

5.2 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The ASB addresses the requirements of the NSW Health's Engineering Services and Sustainable Development Guidelines. ESD considerations have been made with regard to energy consumption, materials selection, waste minimisation, sustainable procurement, reducing private car transportation, and minimising water consumption. Accordingly, no mitigation measures are required.

5.3 AMENITY

The scale of the ASB will impact on solar access to existing properties in Gray Street. The extent of impact has been carefully identified and will potentially reduce solar access to Gray Street properties for up to 16 weeks of the year.

Given that the scale of the ASB reflects the functional health requirements of the regional community, the solar access impacts represent a necessary trade-off between fully meeting community health requirements, maintaining a functioning hospital and the limited development opportunities within a tightly restricted site.

A communication strategy has been established to manage the impact on the relevant properties and consultation has commenced.

5.4 NOISE AND VIBRATION

The main noise and vibration generating sources and have been identified. A detailed construction noise and vibration management plan will be developed once a construction program has been prepared. Refer to the Preliminary Acoustic Report at Appendix H.

5.5 TRANSPORT AND ACCESSIBILITY IMPACTS

The Traffic and Accessibility Study found that the proposed development will generate an insignificant increase in traffic volumes on adjacent streets. There will be no adverse impact on local traffic and hence no mitigation measures are required.

The identified additional parking provision of 219 spaces will address the forecast interim needs in 2018. However, there will be a need to develop a parking strategy that will address the progressive occupancy of the ASB which is understood to be fully operational in 2022 generating a further demand for an additional 140 car park spaces.

5.6 HERITAGE

The heritage assessment found that the proposed works will have no physical impact on the adjacent heritage significance of the Fire Station.

Accordingly, no mitigation measures are required.

5.7 EXISTING STRUCTURES ON SITE

The relocation of various facilities from both the TWB and CSB to the completed ASB will release some 4,800m² of floor space. Part of the ASB proposal provides for the refurbishment and utilisation of the released areas for hospital purposes.

5.8 INFRASTRUCTURE AND UTILITIES

Gas, water, electricity and communications providers have indicated adequate capacity of existing infrastructure to cater for the proposed ASB development.

Accordingly, no mitigation measures are required.

5.9 SEDIMENT, EROSION AND DUST CONTROLS (CONSTRUCTION AND EXCAVATION)

A Preliminary Construction Management Plan has been prepared (refer the Appendix J)

A Construction Management Plan (CMP) will be prepared by the Main Contractor appointed for the ASB project and will address a range of environmental control measures to be considered during the construction process including sediment, erosion and dust.

5.10 GROUNDWATER

The proposal is consistent with NSW State groundwater policies, and does not detrimentally impact on groundwater quality or the health of groundwater dependent ecosystems.

5.11 HAZARDS

The proposal has been assessed against State Environmental Planning Policy No 33 - Hazardous and offensive Development.

A description of the proposed storage, use and management of any hazardous material and measures to be implemented to manage hazards and risks associated with the storage is provided in the SEPP33 Report attached to this EIS (refer to Appendix F). Implementation of safety precautions for the storage of equipment and associated radiation hazards related to medical imaging, including x-rays, nuclear scans and radiation oncology are also provided in this section.

Accordingly, no further mitigation measures are required.

6.0 ENVIRONMENTAL RISK ASSESSMENT

Based on the environmental assessment in Section 4, the following Environmental Risk Analysis assesses the significance of the identified impacts and the ability to manage those impacts to establish a residual risk rating. Refer to Table 8.

The significance of identified environmental impacts are assigned a value between 1 (Low) and 5 (Extreme) based on:

- The receiving environment;
- The level of understanding of the type and extent of impacts; and
- The likely community response to the environmental consequence of the project.

The manageability of environmental impact is assigned a value between 1 (Simple) and 5 (Complex) based on:

- The complexity of mitigation measures;
- The known level of performance of the safeguards proposed; and
- The opportunity for adaptive management.

The sum of the values assigned provides an indicative ranking of potential residual impacts after the mitigation measures are implemented. Refer to Table 9.

Significance of Impact	Manageability of Impact					Residual Impact
	5 Complex	4 Substantial	3 Straightforward	2 Standard	1 Simple	
1 - Low	6 (Medium)	5 (Low-Medium)	4 (Low-Medium)	3 (Low)	2 (Low)	
2 - Minor	7 (High-Medium)	6 (Medium)	5 (Low-Medium)	4 (Low-Medium)	3 (Low)	
3 - Moderate	8 (High-Medium)	7 (High-Medium)	6 (Medium)	5 (Low-Medium)	4 (Low-Medium)	
4 - High	9 (High)	8 (High-Medium)	7 (High-Medium)	6 (Medium)	5 (Low-Medium)	
5 - Extreme	10 (High)	9 (High)	8 (High-Medium)	7 (High-Medium)	6 (Medium)	

Significance of Impacts:

5 Extreme	E1 - Undisturbed receiving environment E2 - Type or extent of impacts unknown E3 - Substantial level of community concern
4 High	H1 - Sensitive receiving environment H2 - Type or extent of impacts not well understood H3 - High level of community concern
3 Moderate	Mo1 - Resilient receiving environment Mo2 - Type or extent of impacts understood Mo3 - Community interest
2 Minor	Mi1 - Disturbed receiving environment Mi2 - Type or extent of impacts well understood Mi3 - Some level of local community interest
1 Low	L1 - Degraded receiving environment L2 - Type or extent of impacts fully understood L3 - Negligible level of local community interest

Manageability of Impacts:

5 Complex	C1 - Extensive/complicated range of mitigation measures required C2 - Safeguards or technology are unproven C3 - Adaptive management not appropriate
4 Substantial	Sub1 - Significant mix of mitigation measures required Sub 2 - Limited evidence of effectiveness of safeguards Sub 3 - Adaptive management feasible
3 Straightforward	Str1 - Straightforward range of mitigation measures required Str2 - Good understanding of effectiveness of safeguards Str3 - Adaptive management readily applicable
2 Standard	Sta1 - Simple range of mitigation measures required Sta2 - Substantial evidence for effectiveness of safeguards Sta3 - Adaptive management unlikely to be required
1 Minimal	Min1 - Minimal/no mitigation measures required Min2 - Safeguards are standard practice Min3 - Adaptive management not required

TABLE 08: Environmental Risk Assessment Values

Issue	Phase	Identified Environmental Impact	Risk Assessment		
			Significance of Impact	Manageability of Impact	Residual Impact
Built Form and Urban Design	Operation	The built form of the ASB broadly matches the scale of the existing TWB and CSB.	2 Minor (Mi2, Mi3)	2 Standard (Sta1)	4 Low-Medium
Amenity	Operation	As a consequence of the height and required building footprint, there will be shadow impacts on some neighbouring existing dwellings and apartment buildings.	4 High (H1, H3)	4 Moderate (Sub1)	8 High-Medium
Ecologically Sustainable Development (ESD)	All	The proposed ESD measures will have a positive impact on the environment. Hence, there is no environmental risk identified.	Not Applicable	Not Applicable	Not Applicable
Noise and Vibration	Construction	Construction noise and vibration impacts are expected to be associated with construction equipment and activities.	2 Minor (Mi1, Mi2, Mi3)	2 Standard (Sta1)	4 Low-Medium
	Operation	The primary source of operational noise will be generated by mechanical services equipment.	1 Low (L2, L3)	2 Standard (Sta1)	3 Low
Transport and Accessibility	All	The proposed development will generate an insignificant increase in traffic volumes on adjacent streets. There will be no adverse impact on local traffic and hence no mitigation measures are required.	Not Applicable	Not Applicable	Not Applicable
Heritage	All	There will be no physical impact on the adjacent heritage significance of the Fire Station.	Not Applicable	Not Applicable	Not Applicable
Utilities	All	Gas, water, electricity and communications providers have indicated adequate capacity of existing infrastructure to cater for the proposed ASB development.	Not Applicable	Not Applicable	Not Applicable
Drainage	All	Drainage needs for ASB were implemented as part of ED works. The new building will be tied into the ED drainage system.	Not Applicable	Not Applicable	Not Applicable
Sediment, Erosion and Dust Controls	Construction	Potential sediment pollution as a consequence of excavation and construction activities.	2 Minor (Mi1, Mi2)	1 Minimal (Sim2)	3 Low

TABLE 09: Environmental Risk Analysis

Issue	Phase	Identified Environmental Impact	Risk Assessment		
			Significance of Impact	Manageability of Impact	Residual Impact
Waste	Construction	Environmental impacts associated with the disposal of construction and hazardous waste.	2 Minor (Mi1, Mi2)	1 Minimal (Sim2)	3 Low
	Operation	Health risks associated with Contaminated Waste (including clinical waste and sharps).	2 Minor (Mi1, Mi2)	1 Minimal (Sim2)	3 Low
Hazards	All	Potential spills or leaking as a consequence of handling, use and storage of hazardous substances.	2 Minor (Mi1, Mi2)	1 Minimal (Sim2)	3 Low

Summary of Environmental Risk Assessment

The results of the environmental risk analysis indicate that the majority of identified environmental impacts are of low risk, given that the type and extent of impacts are well understood (as described in Section 4). The mitigation measures required are straightforward to implement.

The risk assessment demonstrates High-Medium residual impact on residential amenity due to overshadowing as a consequence of the proposed ASB. As noted in Section 5, the scale of the ASB reflects the functional health requirements of a tertiary referral hospital. Therefore, the solar access impacts are unavoidable for the facility to meet statewide clinical requirements whilst maintaining a functioning hospital within the constraints of the available site. To help mitigate the risks, a communication strategy has been established to manage the impact on the relevant properties and consultation has commenced.

TABLE 15 [CONTINUED]: Environmental Risk Analysis

7.0 JUSTIFICATION OF THE DEVELOPMENT

This section specifically addresses the following EIS requirements under Schedule 2 of the Environmental Planning & Assessment Regulation 2000:

(1) *An environmental impact statement must also include each of the following:*

(f) *the reasons justifying the carrying out of the development, activity or infrastructure in the manner proposed, having regard to biophysical, economic and social considerations, including the principles of ecologically sustainable development set out in sub-clause (4).*

(4) *The principles of ecologically sustainable development are as follows:*

(a) *the **precautionary principle**, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*

- (i) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
- (ii) *an assessment of the risk-weighted consequences of various options,*

(b) ***inter-generational equity**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*

(c) ***conservation of biological diversity and ecological integrity**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*

(d) ***improved valuation, pricing and incentive mechanisms**, namely that environmental factors should be included in the valuation of assets and services, such as:*

- (i) *polluter pays, that is, those who generate*

pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) *the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*

(iii) *environmental goals, having been established, should be pursued in the most cost effective way by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.*

7.1 PRECAUTIONARY PRINCIPLE

If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

A comprehensive assessment of environmental impact has been undertaken involving the preparation of numerous environmental and technical studies. The studies have not identified any potential for serious or irreversible environmental damage to occur as a consequence of the proposed development.

On that basis, the proposed ASB development is in accordance with the precautionary principle.

Notwithstanding, any environmental impact or (potential impact) identified will be mitigated by the measures outlined in Section 5.0 to ensure that the proposed development will not result in environmental degradation.

7.2 INTER-GENERATIONAL EQUITY

The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

The new Acute Services Building Redevelopment will offer modern, contemporary health care facilities with high quality care standards to cater for current and future demand, thereby improving and enhancing the delivery of health services to the local and regional community.

Accordingly, the proposed development is in accordance with the principle of inter-generational equity.

7.3 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

That conservation of biological diversity and ecological integrity should be a fundamental consideration.

The ASB Redevelopment of the Hospital does not affect any threatened or ecologically endangered species, populations, communities or significant habitat.

Accordingly, there will be no impact on the conservation of biological diversity and ecological integrity.

7.4 IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS

The financial viability of the development has been deemed to be satisfactory. Following capital and budget

value revisions the design of the new Acute Services Building has made spatial allowance for the hospital to pursue value for money initiatives at a future date, or for the system to be implemented as part of the ESD site wide initiatives under consideration.

8.0 CONCLUSION

This Environmental Impact Statement has been prepared for the proposed SGH ASB Redevelopment, comprising the construction of a new ASB, vertical expansion of the multi-level carpark on Gray Street and part refurbishment of the existing hospital buildings.

The key objective of the proposal is to enhance the delivery of health services in the South Eastern Sydney Local Health Network by providing a modern, contemporary health care facility with high quality care standards that will cater for the current and future demands of the regional community.

The functional requirements of the proposed development have been carefully balanced against the need to safeguard the amenity and environmental quality of the existing health precinct.

A range of development options were explored leading to the proposed ASB as the preferred option. Systematic analysis has determined that the only viable option was for the ASB to be co-located above the new ED and adjacent to the CSB and TWB. The consequences of not proceeding with the development would be that NSW Health will be unable to meet the future health care demands of the regional community, with serious implications for the health and wellbeing of the community.

An assessment of environmental impact has been carried out in accordance with the Secretary's Environmental Assessment Requirements, which demonstrates that apart from impacting on solar access to adjacent residential development there are no significant environmental impacts associated with the proposed works. Where relevant, a range of mitigation measures have either been integrated into the design approach

or proposed to ensure that there are no adverse environmental impacts.

The proposed development is justified on the basis that it is in accordance with the ESD principles of precaution and inter-generational equity.

The construction of the St George ASB Redevelopment will enable the Hospital to meet the following needs of the community:

- Increasing trauma presentations
- Changes in local demography and disease patterns as the population ages, and the increasing burden of aged related chronic disease
- Ageing infrastructure, including aging buildings, land lock, lack of single room and isolation rooms, and outdated ward layouts
- Utilisation of not fit-for-purpose ward areas for growing demands in critical care and other services with infection control, OH&S and other clinical implications
- Rising consumer expectations
- Need to implement medical advances and install new technology
- Need to increase patient flow to meet demand. This increased demand and flow increases infrastructure "wear and tear"
- Imperative for maintaining quality and safety of health services

Accordingly, the Minister's favourable consideration of this Development Application is sought.

SCHEDULE OF APPENDICES

A. Architectural Drawings

Prepared by Jacobs

B. Aviation Report

Prepared by Avipro

C. Transport Assessment

Prepared by Arup

D. Groundwater Assessment

Prepared by Coffey

E. Structural Report

Prepared by Enstruct

F. SEPP 33 Hazard Report

Prepared by Aecom

G. Authority Utility Supply Report (Water + Gas)

Prepared by Acor

H. Acoustic Report

Prepared by Acoustic Logic

I. Mechanical and Vertical Transportation Services Report

Prepared by Aurecon

J. Preliminary Construction Management Plan

Prepared by Aurora Projects

K. Capital Investment Value (CIV) Report

Prepared by Altus Page Kirkland

L. Integrated Water Management Plan

Prepared by Acor

M. Shadow Diagrams

Prepared by Jacobs

N. Heritage Impact Statement

Prepared by Urbis

O. Contamination Reports

Prepared by CH2MHill