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1 Executive Summary

On 18 June 2017, the NSW Government announced a $35 million commitment to the Griffith Base Hospital (GBH) Stage 1, in order to provide funding for planning of the facility requirements of the Clinical Services Plan (CSP), and provide upgraded and expanded facilities for priority services and enable future planning.

A Clinical Services Plan (CSP) Refresh was prepared in December 2017. The document identifies a range of services that are operating at capacity and supports an upgrade to contemporary practice, including a greater emphasis on ambulatory and non-inpatient care models, as well as aged care and inpatient rehabilitation.

Griffith is located in the Murrumbidgee Irrigation Area, which lies west of Sydney in the Riverina Region. The D-shaped site was designated as a public hospital in the original 1914 Griffith master plan. The GBH was commissioned in 1922. Since then, development has occurred in a piecemeal manner in response to the changing needs of the community. The planning has been disjointed, with long travel distances for patients and staff between services that should be collocated in a contemporary hospital. There are multiple level changes along corridors which make circulation unclear and create operational issues. The majority of the buildings and infrastructure are outdated and pose multiple challenges, including non-compliance with building regulations, standards and health guidelines.

The main hospital building contains clinical and clinical support facilities, with separate blocks linked by a corridor for Maternity, Paediatrics and Inpatients. Non-clinical support facilities including Kitchen, Stores, Mortuary and Workshops, are also located in separate buildings. The site has multiple access points, and there is no clear separation of public, staff, emergency and service vehicle access.

Master planning aims to address and develop the core clinical, operational and functional relationships outlined in the CSP. The following key hospital planning principles shall be adopted:

- Align with Health Service Plan
- Promote wellness to the community
- Respect and address the cultural diversity of the local community
- Comply with current Standards and Guidelines
- Achieve high design quality
- Minimise disruption to ongoing operation during any works.
Retention of the main building, and establishing a service link to St Vincent’s Private Community Hospital (SVPCH) to form an integrated regional health campus, have been identified as key project drivers. The preferred master plan zone is between these buildings, where the majority of building stock is sub-standard and requires demolition. The Murrumbidgee Local Health District (MLHD) determined that key linkages to SVPCH are based on clinical adjacencies and patient flow, with close access to Theatres, Emergency Department (ED), Medical Imaging and Critical Care Unit (CCU) preferred. The master plan proposes a physical link that facilitates back of house access to enable movement of services, patients and staff.

A total of 6 zonal master plan options were narrowed down to 2 preferred solutions by the Executive User Group* (EUG) on 8th March 2018; options 5 and 6. Both incorporate the requirements of the CSP, preferred functional relationships and key project drivers.

The Executive User Group has identified option 6 as the preferred master plan, and has recommended it be developed to concept design.

*The Executive User Group had representatives from GBH, MLHD, the Local Health Advisory Council (LHAC), Clinical Staff, Health Infrastructure and the Project Team consultants.
2 Terms of Reference

2.1 Methodology

The projected capacity requirements for the Griffith Health Services were outlined in the Clinical Service Plan Refresh (CSP). This formed the basis for the scope of the proposed hospital master plan.

DJRD Architects were appointed to undertake initial master planning, feasibility development and schematic design services for the master plan, as well as completion of Stage 1 Early and Enabling works.

A high level Schedule of Accommodation (SoA) was prepared. This established the core clinical, operational, and functional relationships and their massing, for completion of the high level zonal master plan.

The master planning process considers a number of options to redevelop the existing facilities, to accommodate the future service requirements, and achieve optimum functional relationships. The outcome is the preferred master planning strategy, recommended to be further developed in the concept design stage.

2.2 User Engagement

This master plan has been developed in consultation with a number of stakeholders. These have included:

- Inspection of existing facilities with Hospital personnel
- Executive User Group consultation meetings
- Health Infrastructure internal review

Sign-off Process

A single option 6 has been selected for development to concept design by the Executive User Group and was endorsed through the project governance in April 2018.

2.3 Documentation Review

This Master Plan is underpinned by a variety of other studies and reports including:

- Griffith Health Services Plan Refresh 2017, Version 1.6, February 2018, MLHD
- Griffith Health Services Plan 2014-2022, Version 3.1, January 2015, MLHD
- MLHD Asset Strategic Plan 2017/2018 – 2027/2028, Version 1.0, MLHD
- Griffith Regional Health Service, Site Master plan, Version 2, 10.02.2014, Kemp Consulting
- Environmental Site Assessment, Preliminary, 8.12.2017, EIS.
- Geotechnical Investigation, Version 0, 05.12.2017, JK Geotechnics
- Hazardous Materials Survey, Final Issue, 31.08.2015, ESP
3 Service Planning Summary

3.1 Existing Health services

Griffith Hospital has a peer group classification as a District Group 1 and provides most of its clinical services at a role delineation level of 4. The Griffith Health Service (GrHS) provides inpatient acute, sub-acute and community-based services, along with a hub role to surrounding health services. GrHS provides health services to the people in the Local Government Areas (LGA) of Griffith, Leeton, Murrumbidgee, Carrathool, Hay, Narrandera, Bland and as Lake Cargelligo (part of the Lachlan LGA).

The following services are provided at the Griffith Hospital site:
- Adult inpatient medical
- Adult inpatient surgical
- Maternity
- Special care nursery
- Paediatric inpatient
- Critical care
- Emergency
- Perioperative
- Medical imaging
- Chemotherapy
- Renal Dialysis
- Hospital in the Home
- Rehabilitation and maintenance
- Pathology
- Pharmacy
- Outpatients
- Dental health
- Health education

These are supported by a full range of administrative and non-clinical services.

Services currently provided by the Griffith Health Service in owned or leased accommodation off-site include:
- Mental Health and Drug and Alcohol Services
- Most community health services including community nursing services, population health services, sexual health and HIV/AIDs services
- Physical Abuse and Neglect of Children (PANOC) – child protection services
- Aged Care Assessment Team (ACAT), Aged Care Services in Emergency Teams (ASET) and Integrated Care Connecting Care
- Ambulatory Day Aged Care Services (Transitional Rehabilitation Aged Care Service (TRACS) and Community Acute and Post-Acute Care (CAPAC).

Some of these services may be relocated to the main hospital and have been factored into the spatial allocation for the master plan.
3.2 Existing Facilities

The Griffith District Hospital was founded in 1922. Today there are approximately 30 buildings located on the site, some of which date back to 1931. These are of varying sizes, ages and condition. Development on the site has occurred progressively, but with no apparent planning strategy. Generally, facilities are outdated and unsuited to the delivery of contemporary models of care. Many are in fair to poor condition and do not comply with current building regulations or health facility guidelines.

3.3 Future Needs

A Clinical Services Plan was prepared by the MLHD in 2015 and a subsequent “Refresh” was completed in December 2017. It sets out the projected demand for health services to 2030/31, considers the existing pattern of service delivery, and proposes models of care to achieve the objective of improved health care service provision for people living in Griffith and the catchment communities. The development of the plan was informed by consultations with the Griffith community, including local health care providers, and staff of both the Griffith Base Hospital and the MLHD.

The following table compares the current provision of acute services at Griffith Base Hospital with the future required facilities proposed by the CSP to meet anticipated service needs.

Current and Proposed Facilities

<table>
<thead>
<tr>
<th>Beds/ Chairs or Equivalent</th>
<th>Current (available 2017)</th>
<th>CSP Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient Beds (HealthAPP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surgical</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Medical and Surgical Overnight</td>
<td>0</td>
<td>49</td>
</tr>
<tr>
<td>Medical and Surgical Day Only</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Special Care Nursery</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Nursery Cots (Bassinets)</td>
<td>14</td>
<td>12 – not generally included in bed numbers and not included below</td>
</tr>
<tr>
<td>Paediatrics</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Paediatrics - day only</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Critical Care Unit (ICU/ HDU/ CCU)</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Hospital in The Home (HiTH)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Aged Care and Rehabilitation Unit (recovery, maintenance, palliative care and Stroke)</td>
<td>4 (part of medical – not included below)</td>
<td>20</td>
</tr>
<tr>
<td>Total - Inpatient Beds/Cots</td>
<td>100</td>
<td>126</td>
</tr>
</tbody>
</table>

Emergency and Ambulatory Services

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>CSP Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Resuscitation Bays</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Emergency Observation/Treatment Bays</td>
<td>8 includes 1 paed + 1 plaster bay</td>
<td>10</td>
</tr>
<tr>
<td>Emergency Short Stay Unit (EMU)</td>
<td>0</td>
<td>8 (4 beds from medical allocated here to create new Unit but not included in total below)</td>
</tr>
<tr>
<td>Emergency low stimulus/ safe room</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Beds/ Chairs or Equivalent</td>
<td>Current (available 2017)</td>
<td>CSP Proposed</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Inpatient Beds (HealthAPP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Procedure rooms (eye etc.)</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Emergency/ Primary Health consult rooms</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Sexual Assault dedicated room</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Renal chairs (does not include PD training Chair)</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Chemotherapy chairs</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Dental chairs (treatment and therapy)</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Outpatient/ Community Health/ MHDA</td>
<td>-</td>
<td>60</td>
</tr>
<tr>
<td>Ambulatory care therapy rooms/Gymnasium</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Ambulatory care procedure room</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total – Chairs/ Beds/ trolleys</strong></td>
<td><strong>29</strong></td>
<td><strong>117</strong></td>
</tr>
</tbody>
</table>

**Other Service Delivery Units (not including imaging and support services)**

<table>
<thead>
<tr>
<th></th>
<th>Current (available 2017)</th>
<th>CSP Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Theatres</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Procedure Room</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Recovery (first stage)</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Birthing room</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Assessment room (alternate use as additional birthing room)</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

**Other**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff accommodation</td>
<td>13 units with 38 beds</td>
<td>– off site leased units</td>
</tr>
<tr>
<td></td>
<td>3 x 2 bedroom unit,</td>
<td>– on site for Junior Medical Officers on rotation</td>
</tr>
<tr>
<td></td>
<td>4 queen bedrooms</td>
<td>– house on site for students on placement</td>
</tr>
<tr>
<td></td>
<td>Serviced Apartments</td>
<td>– used for visiting Specialists</td>
</tr>
<tr>
<td>Relative accommodation</td>
<td>4 studios</td>
<td></td>
</tr>
<tr>
<td>Education and training facilities</td>
<td>Training school</td>
<td>Required</td>
</tr>
</tbody>
</table>
4 The Site

4.1 Location

Griffith Base Hospital is situated in the regional city of Griffith, which is located in the north-western part of the Riverina region of NSW. Griffith is approximately 570km west of Sydney, 360km northwest of Canberra, and 180km northwest of Wagga Wagga.

Griffith was created by the NSW State Government Murrumbidgee Irrigation Area (MIA) project, which intended to supply irrigation from the river to open up farming in western NSW. Walter Burley Griffin planned the city in 1914 for a population of 30,000, with a distinctive radial pattern of tree-lined ring roads. The Hospital site is part of an important axial link running diagonally in a north-south direction through the city, connecting the civic (Council) precinct in the south, with the Hospital and Scenic Hill in the north.
While on plan the hospital still has a direct link to the Council Circle, the key road link to the commercial precinct of the city is dog legged, and the axial road in reality is a residential strip crossing a train line.

The primary catchment for the Griffith Health Service is the Griffith Local Government Area (LGA) which has a population of approximately 26,000 and accounts for 65% of inpatients. The secondary catchment for the Health Service accounts for approximately 30% of inpatients from neighbouring LGAs.
4.2 Site Plan

Griffith Base Hospital is located on a large D-shaped block of approximately 6.4 hectares, bounded by Warrambool Street to the north-east and Noorebar and Animoo Avenues in a semi-circular boundary. It is approximately 700m from the main street of Griffith and is angled on a 45-degree axis to towards the north, with multiple streets meeting the site in a radial manner.

![Hospital Site Aerial View](source: SIX Maps, no date)

The original city master plan is evident in aerial views of the hospital site. However, the piecemeal development and renovations to the site infrastructure have no clear planning strategy and do not address the aspirations of the original plan.

![Walter Burley Griffin’s Vision for Griffith 1914](source: Griffith City Council, 2015)
The gradual development of the hospital to date has resulted in approximately 30 buildings of varying sizes, conditions, ages, orientations and constructions. Most of the hospital infrastructure is outdated. The Main Medical Services building is entered from the south and linked by a corridor to other buildings. There is a private hospital, SVPCH to the north east, and there are two private health care providers to the south-west. A church and school are opposite the site on Warrambool Street.

The site is sparsely landscaped, with grass and isolated clusters of trees around the periphery and in courtyards. The main building driveway and carpark are bordered by banked garden beds with shrubbery.

4.3 Town Planning Parameters

Griffith Base Hospital is located within the Griffith City Council Local Government Area. Planning Controls relevant to the site include Griffith LEP 2014, DCP 21 Residential Development Policy 1999 and the Griffith Land Use Strategy to 2030 which outlines population growth, and Lifestyle, Development and Environmental Strategies for the future.
4.3.1 Zoning

Zoning – R1 Residential – Neighbouring properties are Zoned R1 Residential, as per Griffith LEP 2014 – Land Zoning Map - Sheet LZN_004A

Minimum Lot Size – 300 sqm, as per Griffith LEP 2014 - Lot Size Map - Sheet LSZ_004A

As the hospital is located in R1 Residential Zone, DCP 21 applies. However, this covers construction of dwelling houses, dual occupancies, and multiple dwellings, and is not applicable to the development of the hospital on Crown Land. The site falls within Precinct 8 – ‘Hospital’, which outlines the particular character and controls for the streets and blocks surrounding GBH.

Land Zoning Map (source: Griffith City Council LEP, 2014)

4.3.2 Title / Ownership/ Site lots

The registered Proprietor of the land is the Greater Murray Area Health Service. It is located at 5-39 Animoo Avenue Griffith 2680 and is described as Lot 2, DP 1043580.

Since the original survey, there have been three subdivisions to the original block.

To the south-west these are:

- private ownership for a Pathology Clinic (3/838351)
- Griffith Medical Centre (4/838351)
To the north-east:

- The Council Owned, St Vincent’s managed Private Community Hospital (1/1043580). The private hospital also maintains an easement to the GBH site for access to its loading dock.

Hospital and neighbouring titles (base source: SIXMaps, no date)

Title survey dated 1931
4.3.3 Heritage Considerations
The hospital site is listed on the Griffith LEP 2015 – Heritage Map - Sheet HER_004A as a General Item.

4.3.4 Setbacks
The setbacks outlined for the site in the Residential DCP dictate setback minimums of 6 metres from the roads within the site.

4.3.5 Height Limits
There are no designated height limits for the site.

4.3.6 Car Parking
DCP 20 (2011) provides parking requirements for Health Services Facilities.

4.4 Site Survey/ Topography
A survey of the site was undertaken by LANDdata Surveys in November 2017 and updated in March 2018. The site falls approximately 10 metres from north to south. The northern portion containing most of the current development is reasonably level, permitting most buildings to be at the same floor level as the upper level of the Medical Services Block. The land starts to fall substantially from north of the Children’s Ward, Medical Services Block and General Ward, Block. This results in a lower ground floor level for these buildings.

4.5 Environment
Griffith is located in the north-western part of the Riverina at an elevation 129m and has a semi-arid climate with hot summers and cool winters. Griffith’s climate is variable, though generally dry, with minimum average temperatures of 5 degrees in July, and maximum average temperatures of 34 degrees in January. The mean annual rainfall is 403mm.
4.6 Sun and Wind Orientation

Winds are generally gentle to moderate, measured predominantly from East and South directions. Stronger winds above 29km/hr are recorded as making up 5% of all wind measured.

During mid-summer, the sun rises approximately 30 degrees south of east and sets approximately 30 degrees south of west. During mid-winter, the sun rises approximately 30 degrees north of east and sets approximately 30 degrees north of west.
4.7 Biodiversity, Flood, Bushfire, Groundwater and Mine Subsidence

Biodiversity
The Griffith LEP Terrestrial Biodiversity Map - Sheet BIO_004 outlines that there is no native fauna and flora on the hospital site that will need to be retained. A Flora and Fauna Assessment of the site will provide more detail of the native biodiversity requirements of the area.

Flooding
Griffith is part of the Murrumbidgee Irrigation Area and is located near several large bodies of water, including Lake Wyangan and Barren Box Swamp. Griffith and its surrounding towns lie within the Main Drain “J” Catchment which feeds into Mirool Creek.

Studies commissioned by Griffith City Council, including the Main Drain J and Mirool Creek Study (2015) and the CBD Overland Flow Flood Study (2012) show that some parts of Griffith and its surrounding towns have previously been significantly affected by flooding. However, both studies show that land including and around the hospital site is elevated and would not be affected by flooding in the case of maximum (200 years) flood events. The maximum flood simulations indicate inundation of 0.25 – 0.5m could extend to Wakaden Street, which is approximately 350m from the hospital site (CBD Overland Flow Flood Study, 2012).

Bushfire
The NSW Rural Fire Service Mapping tool indicates that while the hospital site is approximately 700m from unused bushland that is zoned as bushfire prone, the hospital site itself is not within a bushfire prone zone.

Groundwater
The Griffith LEP Groundwater Vulnerability Map - Sheet GRV_004 indicates that while there is groundwater vulnerability in areas near Griffith, there are no groundwater issues within Griffith or near the hospital site.

Mine Subsidence
The Subsidence Advisory NSW district map indicates that Griffith is not in a mine subsidence district.

4.8 Neighbouring Service Providers on the Site

The site comprises four lots including the Griffith Base Hospital itself, as well as three private healthcare providers: the recently completed St Vincent’s Private Community Hospital (SVPCH), Griffith Medical Centre, and a Private Pathology Clinic. The key project driver is to create an integrated health precinct.

Within Griffith, there are a variety of local healthcare providers ranging from Aboriginal and Community Health, Aged Care, Mental Health, Drug and Alcohol and Women’s Health services.

4.9 Adjoining Properties

Surrounding development mainly comprises residential properties on Animoo and Noorebar Avenues. A primary school and church are located on Warrambool Street. Another church is located directly off Noorebar Avenue.
4.10 Site Access

Access to the site is quite porous in nature due to the radial manner in which many surrounding streets connect to Noorebar Avenue, providing various access points.

Vehicular Access

There are currently seven vehicle access driveways to the site and various parking areas, both paved and unpaved. The main public access is from Noorebar Avenue in the south, and service access is from Animoo Avenue in the north.

A total of 271 on-site parking spaces have been identified, although these are not all in marked bays. In addition, kerbside parking is available for approximately 160 vehicles along Warrambool Street, Animoo Avenue and Noorebar Avenue.

Parking for the public and staff is currently distributed around the site. The hospital will not reduce the quantity of car parking space available now and will be subject to a full parking assessment.

Primary access points are:

- A one-way driveway off Noorebar Avenue in the south, with ramped access to the upper level of the Medical Services Block containing the Main Entry and Emergency ambulance entry, and at ground level, accessing a small public parking area and the General Ward Block.

- A second driveway off Noorebar Avenue in the south, serving the main hospital car park and the lower level of the Medical Services Block.
- A driveway in the east from Animoo Avenue, providing access to the TRACS building, Relative’s Accommodation, and the rear of the Medical Services Block. This is primarily used by staff, ambulances accessing the Main Services Block and service vehicles to the main plant rooms.

- A driveway in the northwest, providing access to the main service areas and an unsealed car park primarily used as staff parking.

- A driveway off Warrambool Street, providing access to a public carpark serving the specialist clinics and rehabilitation facilities.

- A second driveway off Warrambool Street, providing access to the Maternity Unit.

- A third driveway off Warrambool Street, providing access to the School of Nursing and the former Nurses Home.

**Pedestrian Access**

There is a recently completed continuous footpath around the periphery of the site. There are numerous entries to the Hospital. Most buildings have at least one entrance as well as internal access via the main corridor system which links the main clinical facilities.

Main public car parks are a level lower than the Hospital’s Main Entry and Emergency Department, and have no direct access to these departments.

A small portion of the site has a path shared between pedestrians and cyclists. The Griffith Council Bicycle Plan shows an off-road shared path on Noorebar Avenue is proposed.
Public Transport
Two bus lines currently run to Griffith Base Hospital, with stops at Animoo Avenue, the corner of Animoo and Wyangan Avenues, and the corner of Kooringal and Noorebar Avenues.

Hospital Internal Travel Distances
As the hospital is currently largely a single storey building, travel distances are horizontal, not vertical. The greatest distance from the front entry to workshops is just over 100m. Given that the preferred master plan zone is in the location of the existing hospital, travel distances of 100-150m can be expected.

4.11 Site Acquisition and/or Consolidation requirements
There is no requirement for site acquisition or consolidation.
5 Functional Relationships and Assessment

5.1 Existing Functional Relationships

The current Hospital campus consists of numerous buildings across the centre of the site, connected by corridors and covered walkways. Much of the development has been ad hoc, resulting in poor functional relationships between units.

The main building on the site is the large two storey building at the southern end of the complex. Due to the fall of the site, the upper level of this building establishes the main floor level for the Hospital campus.

This building contains:
- Executive Administration, Medical Records, Pathology and Pharmacy on the lower level
- Operating Suite, ICU, Medical Imaging, Emergency and Main Entry on the upper level.

A meandering and at times ramped circulation system connects the Main Building to other facilities.

Inpatient facilities comprise:
- A single storey Paediatric Unit incorporating inpatients, outpatient and day procedure recovery facilities. This is a separate building to the west of the main complex and connected by a steep ramped corridor. The unit has its own direct external entrance.
- A two storey adult Medical / Surgical Inpatient Unit in a separate building to the south east of the main complex, also linked by a steep ramped corridor. The Day Surgery (Pre and Post Operative) facilities are integrated within the Surgical Inpatients ward, and are therefore remote from the Operating Theatres.
- A Maternity Unit in another separate more remote building to the east, which has its own external entrance.

Outpatient and Ambulatory Care services are located in the various buildings along the main corridor system. Additional Medical Imaging facilities are located in a lightweight building to the north of the main building. Hospital in the Home is also located in a lightweight extension to an older building, accessed by a steep ramp. A Renal Unit, Specialist Clinics, Rehabilitation and Oncology services are in several buildings in the centre of the complex.

A number of separate outbuildings in the northern portion of the site contain the mortuary, linen handling, stores, kitchen and engineering workshops. A covered walkway connects the Stores, Kitchen and Mortuary to the main hospital complex and extends to the St Vincent’s Private Hospital.

The site arrangement results in generally sub-optimal functional relationships, and limits efficient staffing, operations and use of resources.
5.2 Functional Suitability, Operational Efficiency and Clinical Compliance

A high level assessment of the existing facilities was undertaken, with consideration to the functionality, operational efficiency and compliance with current Australasian Health Facility Guidelines, and other relevant standards (AS, ACEM, ACORN, etc.)

Generally, very few of the facilities were considered functional for current use or compliant with current guidelines. The lack of adequate facilities and poor functional relationships between units across the campus limits operational efficiency.
Facilities that were most functional were the separate self-contained facilities including the Dental Unit, the School of Nursing and the accommodation facilities. The main clinical facilities including Inpatient Units, Critical Care and Operating Suite are considered to have poor functionality, due to infrastructure that does not meet current guidelines.

The Medical / Surgical Inpatient unit comprises a mix of single and multi-bedded rooms. The centralised amenities serve the multi-bedded rooms. Facilities are in need of an upgrade, and room sizes do not comply with current guidelines. Their location in a separate building prevents integration with other inpatient and clinical support services. The day surgery facilities located in the surgical ward area are remote from theatres, leading to operational inefficiency of day surgery services.

Similarly, the relatively remote nature of the Paediatric and Maternity Units results in excessive travel distances to other clinical services and limits the efficiency of clinical operations. These units have a variable occupancy rate, but their isolation requires a full staffing complement to be maintained, even when few patients are admitted.

Intensive care facilities are extremely compromised by lack of space. Bed bays are substantially smaller than current guidelines.
The Operating Suite has inadequate facilities to meet guideline standards and patient flows that have the potential to impact infection control principles. Of particular concern is the location of scope clean-up areas in the corridor used by patients to travel from the theatre to recovery.

The Emergency Department has had a comparatively recent upgrade and is generally functional. However, the Clinical Services Plan identified a need for increased facilities and the implementation of other models such as a short stay unit and GP clinic.

Medical Imaging facilities are split between two buildings that are separated from each other. This is undesirable for patient access and limits functionality and operational efficiency of the unit.

The various ambulatory and outpatient facilities are located in a number of buildings of varying ages and condition. Facilities do not meet current guidelines and are inadequate for the current demand. Contemporary operational models for ambulatory services seek to provide a flexible, integrated and multidisciplinary approach. The existing facilities do not permit this. Planning is currently underway for the provision of new renal and oncology units elsewhere on the site as interim accommodation.

Non-clinical support and Hotel Services are located in a variety of buildings at the rear of the complex. The Kitchen, Stores and Linen Handling facilities are in repurposed buildings that are in poor condition. They are not efficiently planned and compromise efficient service delivery. The Mortuary contains redundant autopsy facilities and is remote from the clinical areas, requiring access via an external covered walkway. Many non-clinical services are provided through a shared service model provider.
6 Building Asset Assessment

6.1 Building Asset Report Overview

The Services Design Team engaged for this project have undertaken existing building assessment reports. In addition, a Site Physical Assessment Report on the Griffith Base Hospital was completed in 2014. Upon review and comparison to existing circumstances, it has been established that apart from some service upgrades, the contents of the previous assessment are still relevant and valid.

6.1.1 Major Plant

The Medical Services Block is served by a central chilled and condenser water plant and distribution system consisting of:

- Two (2) 312kW Carrier fixed speed water cooled screw chillers
- Primary chilled water pumps
- Two (2) cooling towers – 810kW tower thermal unit and 520kW Baltimore Aircoil Company (BAC) Tower
- Primary condenser water pumps

The other buildings around the hospital site are serviced from local Direct Expansion (DX) air conditioning plant.

The heating hot water plant is located in the plantroom adjacent to the Medical Services Block. This plant provides the heating hot water and, indirectly through heat exchangers, the domestic hot water for the Medical Services Block and General Ward Block.
The plant consists of:

- 3 Raypack gas fired hot water heaters (2 x 330kW (1491 MJ/Hr) and 1 x 94kW (420 MJ/Hr))
- 3 primary heating hot water pumps
- 4 secondary system pumps.

6.1.2 Medical Gas

The medical gases provided in Griffith Hospital are:

- Bulk oxygen
- Back-up bottled oxygen
- Medical air
- Suction
- Nitrogen oxide

The oxygen storage tank is located at the rear entry to the hospital campus off Animoo Avenue. These gases are provided either from a central plant, such as the central oxygen and medical air plant, or via manifold systems distributed throughout the hospital campus.
6.1.3 Electrical Supply and Infrastructure

The high voltage (HV) service reticulates to the HV switch and transformer from north of the site. The substation has a capacity of 1,000kVA. Essential Energy have advised that the maximum demand on the substation since the 2015/16 upgrade works is 500Amps. Therefore, there is adequate spare capacity to serve new temporary buildings to suit master plan staging if required.

Two new switchboards were installed in 2016 and comply with current codes and legislative requirements. Spare compartments are available to service new or relocated distribution boards and/or large equipment items. There is a requirement to disconnect unused circuits.

An 825 kVA standby diesel generator was installed in 2016 and has a rated current amps of 1,074Amps. Based on maximum demand values provided by Essential Energy it can be determined that there is adequate spare capacity on the generator to suit new building and staging as required.

6.1.4 Communications Infrastructure

The existing campus distributor is located in the CAPAC building. Racks, devices and cabling are nearing the end of their useful service life. A replacement backbone is required as part of a consolidated master plan.

6.1.5 Water Services
6.1.6 Sewer Services

6.1.7 Gas Services
6.1.8 Fire Services

An assessment of existing fire services has indicated the following:

- There are currently no fire sprinklers on site
- All buildings are equipped with a fire alarm system
- The main hospital building is equipped with an analogue addressable system
- The MFIP services as the centre of fire alarm control for the hospital and is located in the main entrance. It is a Firenet brand that is no longer in production.
- Other main buildings on the site are serviced by conventional style fire alarm systems. These panels are Notifier brand and are no longer in production.
- The main hospital building is equipped with a Master Emergency Control Panel (MECP) which is co-located with the MFIP in the main entry foyer
- The MECP is a Vigilant QE90 and is still in production and fully serviceable.
- Intercommunication of the Warden phones (WIP’s) throughout the main hospital building is controlled via the handset on the MECP
- Ward areas of the building are service by Building Occupant Warning systems. These provide an evacuation alarm only.

6.2 External Areas Site Investigations

6.2.1 Geotechnical

A Geotechnical Report was prepared by JK Geotechnics in December 2017. Their findings identify a medium to high strength sandstone bedrock at depths ranging from 0.2m to 2.6m below the existing surface levels. The topsoil is typically shallow and comprised of silty clay with medium plasticity. Natural soils are silty clays.

Due to the very high rock strength, the report recommends limiting the amount of excavation required.
7 Master Planning Design Principles

7.1 Architectural

7.1.1 Master plan Assessment Criteria

The master planning process involves the development and assessment of a number of options, in order to select the preferred strategy. The following principles and assessment criteria were developed to guide this process.

Overarching Principles

- Align with Health Service Plan
- Promote wellness to the community
- Respect and address the cultural diversity of the local community
- Comply with current Standards and Guidelines
- Achieve high design quality
- Minimise disruption to ongoing operation through appropriate staging of any works.

Assessment Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Service models and functional relationships</td>
<td>Provides optimum functional relationships to maximise operational efficiency. Facilitates clinical and multidisciplinary collaboration</td>
</tr>
<tr>
<td>2. Integrated health precinct</td>
<td>Strengthens links with SVPCH through physical proximity, facilitating access, optimising functional relationships and enabling sharing of services</td>
</tr>
<tr>
<td>3. Urban environment</td>
<td>Building siting and site access does not impact negatively on the neighbouring development. The building form and arrangement responds positively to the surrounding streetscape</td>
</tr>
<tr>
<td>4. Response to the site</td>
<td>Responds to topography, orientation and outlook. Considers opportunities offered by existing infrastructure.</td>
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<tr>
<td>5. Internal environmental quality</td>
<td>Provides a welcoming facility with ease of access and access to natural light and outdoor spaces</td>
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<tr>
<td>6. Internal circulation</td>
<td>Provides clear way finding, minimal travel distances and separation of public, patients, staff and services</td>
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<tr>
<td>7. Future flexibility and growth</td>
<td>Permits flexibility of internal planning and future growth of services (as identified in the HSP) through building adaptation and expansion, i.e. ambulatory care</td>
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</table>
7.1.2 Possible Master Plan Zones

Following assessment of the existing site and infrastructure, a number of potential master plan zones were identified.

**Zone 1** – approx. 19,000m²
- Removes majority of poor building stock.
- Retains (permanently or temporarily) the Medical Services Building, General Ward Block, School of Nursing, Dental Clinic and temporary Renal Unit.

**Zone 2** – approx. 17,000m²
- Allows hospital to continue operating until relocation to the new building but does not provide link to SVPCH which is one of key drivers.
Zone 3 – approx. 22,000m²

- Retains (permanently or temporarily) the Medical Services Building, Children’s Ward, Imaging and temporary Renal Unit.

7.1.3 Key Linkages

Master planning considered the linkages and impact on the following:

- St Vincent’s Private Community Hospital
- Existing Infrastructure
- Warrambool Street

ST VINCENT’S PRIVATE COMMUNITY HOSPITAL
Possible links...
- Emergency Department & Critical Care
- Ambulatory Care
- Non-clinical support services
- Theatres
- Medical Imaging
- Education
- CSSD

WARRAMBOOL STREET
Location of church and school opposite provides Urban identity and character.

KEY LINKAGES & MAIN ACCESS POINTS
Zone 1 & 3 support key linkages.
7.1.4 Preferred Building Location Zone

Zone 1 was identified as the preferred master plan zone for the following reasons:

- Building location is the optimum site to develop a link with SVPCH.
- Removes poor building stock.
- Is most level topography on site.
- Sets main hospital floor level at ground floor of SVPCH and first floor of main building.
- Provides best opportunities for functional linkages.
- Site location provides best urban response.
7.1.5 Access Points

Two alternative locations for the Main Entry to the Hospital were considered.

Access Point A - North Entry
- Level entry into hospital.
- Entry same side as SVPCH.
- Promotes identity of health precinct.

Access Point B – South Entry
- Significant change in ground level to hospital main floor.
- Maintains existing hospital front address.
- More likely to have clashes with Warrambool Street.
- Further from SVPCH entry.
8 Master plan

8.1 Functional Context

For the purposes of planning, a health facility is subdivided into Health Planning Units (HPUs). These are the functional units or departments within the facility, both clinical and non-clinical, and generally closely align with operational units.

Many of these units have similar functions, have interdependencies, or share a common overarching management structure. They therefore may be grouped into a number of clusters.

Clustering of services:

- Aids way-finding by making services easier to locate and access.
- Permits grouping of services into similar hours of operation to maximise efficient facility management and security.
- Highlights desired clinical adjacencies to enable services to be delivered effectively and efficiently.
- Facilitates sharing of both physical and staff resources.
- Provides flexibility to respond to variations in service demand over time.
- Enables collocating services to achieve efficiency during periods of low activity.

8.1.1 Cluster Diagram

10 Service Clusters have been identified for the Griffith Base Hospital. These are:

- Main Entry comprising front of house facilities
- Critical Care comprising Emergency Department and ICU/CCU/HDU
- Inpatient Services
- Clinical Support comprising Medical Imaging, Pharmacy, Pathology, Medical Records and patient services
- Wellness Centre comprising the various outpatient, ambulatory care, allied health and community health services
- Perioperative Unit
- Non Clinical Support comprising hotel and other back of house services
- Administration, both executive and clinical
- Education including in-house, university school and research
- Staff / Family Accommodation, both on site and off site.
The accompanying diagram shows the proposed clusters and the functional units contained within each cluster. It also indicates those clusters that are operational 24 hours per day / 7 days per week, and those that operate on more limited hours – notionally designated 12 hours per day. There is a degree of overlap as some facilities may operate limited hours on a regular basis, but offer after hour services as required.
8.1.2 Functional Relationship Diagram

The attached Functional Relationship Diagram develops the previous cluster diagram to indicate the critical relationships between the clusters and key units. Principal considerations are:

- A single public point of entry is provided to the Hospital, through the Main Entry. This provides direct access to the Emergency Department and the Wellness Centre.
- Within the 24 hour zone, close access is required between the Emergency Department and Medical Imaging, the Critical Care Inpatients and the Perioperative Unit. Access is also required between the Perioperative Unit and the various inpatient units.
- Within the 12 hour zone, close access is required between the Wellness Centre and Medical Imaging, the clinical support services, the Perioperative Unit and clinical administration.
- The link to St Vincent’s Private Hospital has been identified as a key design principle, with a particularly strong relationship to the Perioperative Suite, ICU and Medical Imaging.
- Non clinical support services underpin the Hospital as a whole.
- As previously noted, staff accommodation is a separate group of facilities.
8.1.3 Functional Adjacencies Diagram

A relationship matrix has been developed showing the relationship hierarchies between the various health planning units. These have been categorised as ‘direct access’, ‘ready access’, ‘easy access’ and ‘access not required’.

The critical direct access relationships have been identified. These need to be addressed in planning.

8.1.4 Key Linkages to St Vincent’s Private Community Hospital (SVPCH)

The Griffith Health Services Plan states as a consideration for facility planning:

‘The need to consider and develop synergies between Griffith Hospital and St Vincent’s Community Hospital Griffith in some specialties and support services to create a critical mass.’

Through the User Group process, the key linkages between SVPCH and Griffith Base hospital have been explored. The following diagram highlights the priority linkages together with other key linkages.
8.1.5 Functional Models

Two functional models have been proposed for the master plan of the Griffith Base Hospital. In both scenarios a two storey master plan is assumed.

Model 1 proposes providing a large ground floor containing all clinical services except for Inpatients, together with the various clinical and non-clinical support services. All inpatient units would be located on the first floor.

Model 2 proposes that the various key clusters be provided as a series of two storey components. Thus the Wellness Centre, clinical services and Inpatient units would be provided over 2 storeys. Those services on the ground floor would be the most frequently accessed services, or those requiring external access.

Master planning options have been developed based on both models.
8.2 Zonal Master plan

Using site location criteria established for the master plan as outlined in Section 7 of this report, it was determined that the most suitable location for the new hospital is in the centre of the site. This is where the site is most level and provides a good link to SVPCH. All zonal options utilise this location. In addition, two main entry points were established, either from the north (A) or the south (B), and the impact of retaining or removing the existing Main Hospital Building were explored. All options propose a single point of entry with direct access to both the ED and the Wellness Centre.

On the 8th March 2018, six zonal master plan options were presented to the EUG for evaluation. Using the eight criteria outlined in Part 7.1.1 of this report, the group established two preferred options - Options 5 and 6, which ranked equally.

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<tr>
<th>Assessment Criteria</th>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
<th>Option 5</th>
<th>Option 6</th>
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<td>Service models and functional</td>
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<td>Entry Point (A or B)</td>
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Both options are similar in that they maintain the existing Main Hospital Building. The main clinical facilities will be located between the Main Building and St Vincent’s Private Community Hospital. The main ground floor level will be the upper level of the Main Building as existing, which also corresponds closely with the ground floor level of St Vincent’s Hospital.

Their main point of difference is that Option 5 proposes Functional Model 2 with vertical stacking of the Wellness Centre, clinical services and Inpatients, whilst Option 6 proposes Functional Model 1 with the clinical services and Wellness Centre arranged horizontally and inpatients on the floor above.

In addressing comments made in this meeting, Options 5 and 6 were developed further, incorporating comments received by the EUG.
Option 6 has been selected for development to concept design by the Project Governance. Key commentary from the EUG on the selection of Option 6 included:

- Greater flexibility for future expansion.
- Better supports community wayfinding particularly for aged visitors.
- Creates a ‘hot zone’ on a single level which enables faster response to emergencies.
- Supports more efficient staff flows for future service models.
- Provides flexibility to respond to differing length of patient stay.
- Orientation of IPUs can be designed to maximize views.

The following analysis of Options 5 and 6 incorporate the subsequent planning development.

8.3 Common Planning Principles

8.3.1 Access

Safety and security of staff, patients and visitors is of the highest priority and must be considered at every stage in the planning and design of health care facilities. Control of access is an important element in maintaining security. As a general principle, public access into the hospital should be restricted to a minimum number of points.

It is proposed that there be a single public point through the main entry to access all facilities. A separate, dedicated access point shall be provided for ambulance patients to access emergency.

A controlled corridor will also link the proposed hospital with St Vincent’s Hospital for movement of patients and clinical services as required. Additional controlled entries may be provided for staff. This is desirable to permit staff to enter and exit the Hospital discretely. Access shall also be available via the loading dock.

Access for emergency, health service staff, general public and service vehicles shall be clearly designated and separated. Three main vehicle access points are proposed:

- Emergency vehicle access sharing, or adjacent to, the existing Hotel Services access at the north of the site. A dedicated driveway will access the ambulance bay.

- General Public access in the north western area of the site. This will lead to the main entry, as well as to public parking areas. Parking arrangements will be made for people with disabilities, and drop-off spaces provided for ambulatory patients adjacent to the front entry.

- Service and staff entry via the existing southern roadway system. Access will be provided to the existing lower car park that may be dedicated staff parking, with controlled entry to the lower level of the existing main clinical building. Access will also be provided to the new hospital service area and loading dock.
8.3.2 Flows

Internal circulation through the Hospital can be subdivided into three separate user streams.
- Public
- Clinical
- Service / Logistics

Where possible, these should be separated, although in small facilities such as Griffith, this is not always possible.

As noted, public access to the proposed master plan shall be though the main entry. This shall connect to a clear internal circulation system with corridor and lift access to all publicly accessible areas. These include waiting areas for the Emergency Department, Medical Imaging, Wellness Centre and Day Procedures, and visitor access points to Inpatients and other facilities.

Separate clinical access shall be provided where possible, where discrete movement of staff and patients between units is desirable. This includes between the Emergency Department and Medical Imaging, Operating Theatres and ICU, between Operating Theatres and inpatient units and between GBH and SVPCH. This may include the provision of double sided lifts with staff priority controls.

Service and logistics circulation can involve movement of food, clean supplies, waste and deceased patients. These should be either separated from public circulation or managed so as not to conflict.

Both Options 5 and 6 propose a lower level hotel services area, with a service corridor linking a central lift core, to access highly serviced areas and minimise public interaction.

8.3.3 Hours of Use Zoning

The proposed planning layout facilitates zoning of the building in accordance with hours of use. Generally, the hospital can be divided into two broad zones:
- 24-hour zone: Areas that will be occupied 24 hours per day, 7 days per week. These include inpatient units, Emergency Department, Medical Imaging and Operating Theatres.
- Nominal ‘12-hour’ zone: Areas that are occupied for more limited periods. These include Main Entry, Administration, Wellness Centre, Pathology, Pharmacy, Medical Records and Hotel Services. It is noted that there is some variation in the operating hours of these areas. Some may operate general business hours 5 days per week, others more extended hours 6 or 7 days per week. Starting times will also vary. Flexibility will also be required for areas that may have ad-hoc after-hours on-call activity, e.g., Pathology.

A unit that operates 24 hours over 7 days has different security needs compared to a 9am to 5pm unit. Engineering infrastructure requirements will also vary. Separation of 24-hour zones from other areas permits the locking down of unoccupied areas out of hours to improve security and reduce the energy demands associated with lighting and air conditioning. The engineering plant will be designed to operate full time in the 24-hour zones, but will also be able to be shut off in other areas when unoccupied. However, the 12-hour zone plant will need a degree of flexibility to permit variation in occupancy and as required after-hours access.
8.4 Preferred Option - Option 6

8.4.1 Overview
As previously noted, the proposed Option 6 is generally two storey, with limited lower ground floor areas creating a small third storey component. The principal planning arrangement comprises clinical facilities on the ground floor and inpatients on the first floor.

The main ground floor contains:
- Main Entry
- Emergency Department
- Wellness Centre
- Medical Imaging
- Operating Suite
- Clinical administration

The first floor contains:
- All Inpatient Units
- Education facilities

The existing lower ground floor of the main building contains:
- Administration
- Medical Records
- Pharmacy
- Pathology

An additional lower ground floor area constructed under part of the Wellness Centre contains hotel services.

The main entrance to the Hospital is proposed to be located on the western side of the master plan adjacent to, and connected with, the existing Main Building. Vehicle access will be from Animoo Avenue leading to public parking areas and a drop off area at the entry. Separate access is provided to the Emergency Department for emergency vehicles, for staff access via the lower ground floor, and for service vehicles accessing the Hotel Services areas.

The main entry area will contain public facilities and provide direct access to the Emergency Department and the Wellness Centre, as well as lift access to the upper level inpatient units. A main central corridor provides direct access to Medical Imaging and Day Procedures areas. This arrangement permits all publicly accessible areas to be easily accessed, whilst also enabling separate internal staff and service circulation, particularly between critical care areas and to SVPCH.

Inpatient units on the first floor shall have access to roof terraces where appropriate.

24-hour zoned facilities are located together in the northern half of the ground floor (Emergency, Imaging and Operating Theatres) and on the first floor generally (Inpatients). After-hours access shall be through a 24-hour zone in the entry for the Emergency Department, ensuring security of the overall facility is maintained. Ready access for staff to the inpatient units via stairs and lifts will be available within this zone.
8.4.2 Analysis

Option 6 provides the following advantages:
- Operating Theatres close to SVPCH
- Strong back-of-house link to SVPCH
- Inpatients will achieve good internal environment with views over Griffith
- Good separation of public and private circulation flows
- Good circulation to front entry and separation of vehicles to ED
- Provides a separation of staff and public car parking
- Expansion strategies can be accommodated for all ground floor facilities.

Disadvantages include:
- Retention of Main Building increases ground floor footprint and increases horizontal travel distances.
- Main Entrance is potentially hidden from Noorebar Avenue.
- Ground floor footprint is significantly larger than first floor so subsequent large roof area is required.
- Lack of outside area for Wellness Centre
Option 6 – Public and Staff Flow Diagram

Option 6 – 24 Hour Zone Diagram
8.5 Option 5

8.5.1 Description

The proposed Option 5 is also generally two storey, with limited lower ground floor areas creating a small third storey component. The principal planning arrangement comprises a vertical arrangement of two storey clinical, Wellness Centre and Inpatient facilities.

The main ground floor contains:
- Main Entry
- Emergency Department
- Medical Imaging
- Half of the Wellness Centre
- Half of the Inpatient units
- Clinical administration

The first floor contains:
- Half of the Wellness Centre
- Half of the Inpatient units
- Operating Suite
- Education facilities

The existing lower ground floor of the main building contains:
- Administration
- Medical Records
- Pharmacy
- Pathology

An additional lower ground floor area constructed under part of the Wellness Centre contains hotel services.

As for Option 6, the main entry to the Hospital is proposed to be located on the western master plan adjacent to and connected with the existing Main Building. Vehicle access will be from Animoo Avenue leading to public parking areas and a drop off area at the entry. Separate access is provided to the Emergency Department for emergency vehicles, for staff access via the lower ground floor and for service vehicles accessing the Hotel Services areas.

The main entry area will contain public facilities and provide direct access to the Emergency Department and the ground floor components of the Wellness Centre. A main central corridor provides direct access to Medical Imaging and ground floor inpatient units. Lift access is provided to the upper levels of the Wellness Centre and Inpatient units as well as to Day Procedures areas. All publicly accessible areas are easily accessed, and separate internal staff and service circulation can be achieved.

Inpatient units on the ground floor shall have access to garden areas where appropriate. 24 hour zoned facilities are vertically stacked permitting ready separation of engineering plant. After-hours access shall be through a 24 hour zone in the entry for the Emergency Department, ensuring security of the overall facility is maintained.
8.5.2 Analysis

Option 5 provides the following advantages:

- Operating Theatres close to SVPCH but on first floor and accessed via lifts.
- Inpatients will achieve good internal environment with views over Warrambool Street.
- Good separation of public and private circulation flows.
- Hotel Services under ambulatory care with access separate from public vehicle circulation.
- Good circulation to front entry and separation of emergency vehicles to ED.
- Provides a separation of staff and public car parking.

Disadvantages include:

- Retention of Main Building increases ground floor footprint and increases horizontal travel distances.
- Need to use of lifts reduces clarity of wayfinding for outpatients.
- Main Entrance potentially hidden from Noorebar Avenue.

Option 5 – Floor Plans
Option 5 – 24 Hour Zone Diagram

Option 5 – Public and Staff Flow Diagram
8.6 Infrastructure Master plan

8.6.1 Mechanical
The existing central plant (chillers, cooling towers, etc.) is located within and adjacent to the Main Hospital Building which is to be retained. Retention and expansion of this plant will compromise the planning and construction for the new main entrance to the hospital. It is recommended that this be relocated in, or adjacent to, the first stage of the master plan, with a planned future expansion methodology.

The existing air handling plant is recommended to be replaced given its condition, age and building change of use. A new air handling plant will be provided in localised plant rooms to serve the new facilities.

8.6.2 Electrical and Communications
As the main building is being retained, it is possible to retain the existing transformer and generator. However, given their location to the new front entry, it may be preferable that they be relocated into a central plant.

A new campus distributor will be required.

8.6.3 Medical Gases
The capacity of the oxygen storage tank will need to be upgraded. However, retention in the existing location is subject to resolution of car park and access design.

8.6.4 Hydraulic
As a part of the site wide upgrade, implementation of a cold water ring main around the site is required in a staged methodology. As more buildings become connected to the ring main, the multitude of cold water meters around the site would be decommissioned.

The sewer services to the site are currently adequate for their purpose and there is scope to increase the load to these council connection locations, subject to council consent.

8.6.5 Gas Services
The current gas meter is sufficient for future expansions. Reticulation will be adjusted to suit the new building.

8.6.6 Structural
From a solely structural perspective, Options 5 and 6 are very similar.

Both of the options propose up to 3 storey buildings. At this stage, it is envisaged that the structure for each option would be concrete framed, but other methods of construction will be explored with the client, design team and quantity surveyor during the design process.

Each option involves some degree of at least partially in-ground or basement works, requiring retaining walls or permanent batters behind a basement wall.

Due to the relatively high rock levels, the foundations are likely to be concrete pad footings founded on the rock.
Advice from the structural engineer indicates that both options are structurally viable and no option presents a large degree of relative complexity when compared to the others.

### 8.6.7 Civil

From a solely civil perspective, Options 5 and 6 are very similar. Stormwater detention will be required to limit flows from the post-developed site to that of the pre-developed site.

Both options propose access via Animoo Avenue.

At this stage, we envisage that the detention solutions for each option will be similar. Above ground detention in carparks, as provided for the adjacent private medical centre, is preferred (this limits the depth of ponding, which removes the potential requirement to fence off an above ground detention basin). This is the most cost effective solution. An alternative would be to provide a below ground tank (or above ground rainwater tanks, with a low level outlet that provided dedicated storage).

Water Sensitive Urban Design measures which could be incorporated. This may include shallow rain gardens/bio-retention (water quality treatment measures, which also allow for a level of detention), vegetated swales (allowing for infiltration of runoff from impervious surfaces) and proprietary treatment devices.

Advice from the civil engineer indicates that all three options are viable from a civil perspective and no option presents a large degree of relative complexity when compared to the others.

### 8.7 Master plan Realisation

During any hospital building works it is essential to maintain full operation of the Hospital. This will require staging of any works undertaken. The stage 1 works are envisaged to be undertaken as follows: Early and Enabling Works

Short term enabling and enhancements works are underway to provide necessary upgrades in clinical services priorities. Additional priorities will be identified during the Feasibility phase for potential inclusion in stage 1. These are required to satisfy the short term clinical demands of the site.

Enabling works underway include:

- Construction of a temporary Renal Unit
- Construction of a temporary Oncology Unit
8.7.1 Stage 1

Stage 1 works will be determined during the Feasibility Phase, with the anticipation that the works will include demolition to enable future works, and the potential upgrade of critical clinical services to be identified.

The following priorities have been identified for inclusion in stage 1 scope of works:

- Ambulatory Hub
- IPU Refurbishment
- Critical Care Refurbishment
- New Car Park
- Demolition
The preferred location for the master plan is in the current location of non-clinical services, including kitchen, linen, maintenance workshops, stores, garden sheds and JMO accommodation. These buildings represent the poorest structural quality and most non-compliant structures on the site. Located in this zone is also the Mortuary. Temporary solution to accommodation of these services could include:

- Specialist Clinics – Temporary buildings located on the periphery of the site.
- Kitchen – Temporary kitchen located on the periphery of the site but connected into corridor network.
- Sheds and maintenance – Temporary sheds located around the periphery of the site
- Mortuary – Temporarily building
- JMO Accommodation – Offsite

8.7.2 Master Plan

The realisation of the master plan is not part of the Stage 1 scope and would be developed further during concept and schematic design.

9 Conclusion

The Master Plan has been evaluated against the key principles adopted and endorsed by the EUG. It is recommended that it be adopted.