Architectural Design Statement

Camden Private Hospital

Camden Medical Campus Precinct
Gregory Hills Corporate Park

Prepared by

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For

Gregory Hills Corporate Park Pty Ltd

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1 Introduction

1.1 Purpose of Architectural Design Statement

This Architectural Design Statement has been prepared as part of the Concept State Significant Development Application and EIS submission for the proposed Camden Private Hospital. This statement will address the New South Wales Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEAR) for the proposed development located on The Hermitage Way, Gledswood Hills Lot 846 within Gregory Hills Corporate Park. (Lot 8000 DP1209013)

1.2 Camden Medical Campus Precinct

The Camden Medical Campus Precinct is located within the Gregory Hills Corporate Park currently under development. The Medical Campus Precinct incorporates two adjacent sites which front onto The Hermitage Way. A Development Application has been submitted and approved by the Department of Planning and Environment late in 2015 for a new Specialist Centre adjacent to the subject Private Hospital. The completion of the Private Hospital will complete the development of the Camden Medical Campus Precinct.

1.3 Camden Private Hospital

The Camden Private Hospital within the Camden Medical Campus Precinct represents an iconic landmark for Camden and South Western Sydney, which will provide much needed healthcare services to its dynamic and growing community. The proposed Hospital represents an efficient and contemporary infrastructure option to address the required current and future medical services to this fast developing region of Sydney. The need for medical services has outpaced the supply in this region of Sydney consistently in the past, a scenario the Camden Medical Precinct and Private Hospital will help to alleviate.

The vision for the Camden Private Hospital is a superior and highly functional Hospital symbolising growth and development of the Macarthur region, and providing:

- A patient-centred care environment creating a "hassle free" experience for patients, families and carers
- Quality care and emphasis on patient comfort and safety
- Service delivery based on "barrier-free" principles
- Compliance with all Health Facility Guidelines and relevant codes and standards,
- An iconic landmark in for Camden and South Western Sydney with a contemporary presence
- An integrated patient care, teaching and learning environment
- A healing environment that is enhanced by the maximisation of green spaces and provision of patient accessible landscaped settings
- An efficiently functioning digital hospital maximising new technologies and robotics to facilitate patient care and safety
- A hospital that encourages eco-friendly and sustainable operations
- Efficient staged development potentials
- An attractive work environment for staff and medical professionals, designed to facilitate and cater for the busy work schedules of doctors and nurses.

The integration of education, teaching and research facilities within the Hospital will provide a unique opportunity for the Camden Medical Campus Precinct to become known as a "Knowledge Hub" within the community will be attractive to doctors and other clinicians, as well as professionals in medical-related industries. The educational facilities within the Hospital will focus on creating an innovative and vibrant learning community, with lecture theatres and tutorial rooms throughout the facility, creating opportunities for teaching and collaborative work.

Best practice models of care and hospital operational policies are continually being developed, improved and implemented. Therefore today's design solution may not suit tomorrow's advances in models of care and operational processes. Both the briefing and design need to maintain flexibility. Most spaces need to be capable of multiple use and adaptation. If key clinical spaces are thoughtfully designed to be capable of coping with multiple operational models of today, they will have a much better chance of coping with the operational models of the future. In the hospital's design philosophy, the building's overall configuration, the grid, corridor networks, clear heights, floor structure and services network will be sufficiently adaptable to allow the future conversion of any particular clinical area into an alternative clinical area.

1.4 Site Location – Camden Private Hospital

The Camden Private Hospital site is located within the Camden Medical Campus Precinct which is being established within the **Gregory Hills Corporate Park**. The Gregory Hills Corporate Park is located within the heart of Gregory Hills (Camden LGA) being approximately 1 hour drive to Sydney CBD and 10 minute drive to Campbelltown CBD.

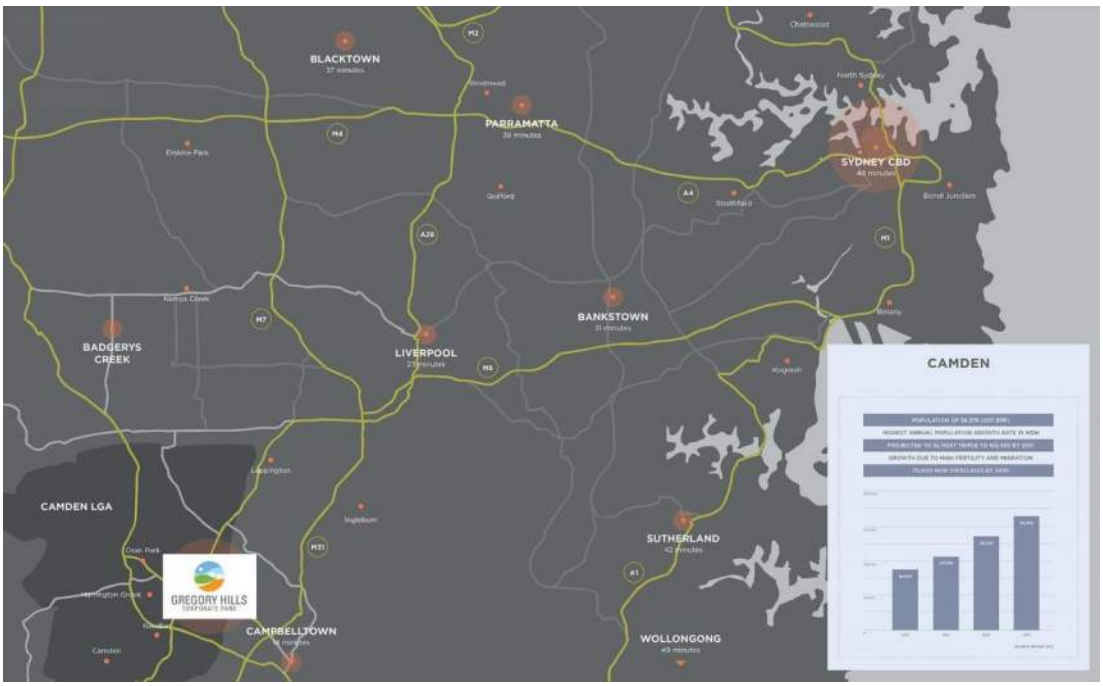


Figure 1: Regional Plan

Situated centrally to the **NSW Government's South Western Sydney Growth Centre**, it is projected that there will be at least 300,000 people and 110,000 new homes by 2030, with 70,000 new homes in Camden alone. The Government has committed $3 billion for infrastructure investment.

The site is located directly adjacent to a 0.8 hectare committed specialist medical centre development and close to commercial and retail spaces as well as having direct access to land dedicated to recreational use.

Figure 2: Local Context Plan

A number of private and public hospitals are located within 20-minute's drive from the Camden Medical Campus Precinct accessible by way of a good network of roads and public transport to all population centres. New and established houses surround the site within close proximity to UWS Medical School.

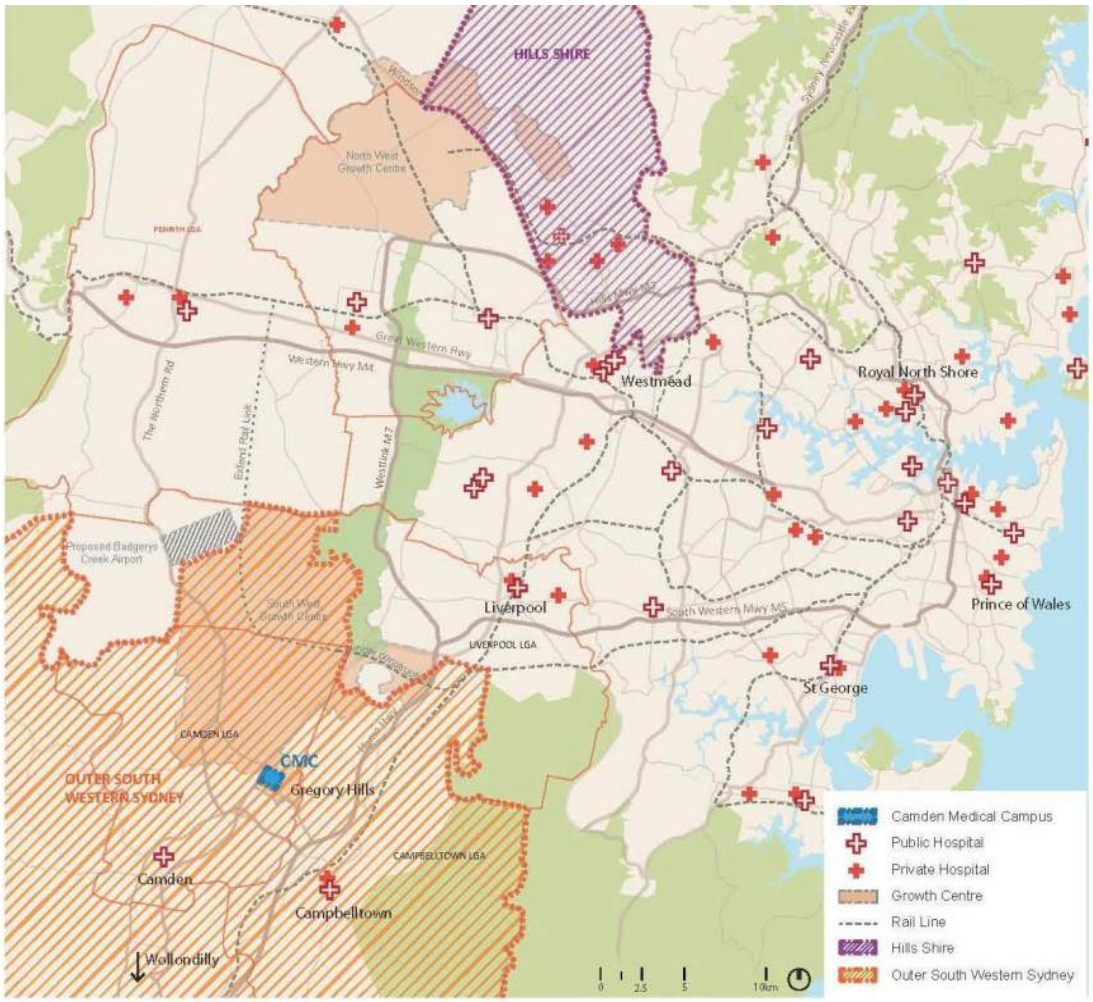


Figure 3: Regional Distribution of Private and Public Hospitals

Figure 4: Local Distribution of Hospitals and Travel Times to Camden Medical Campus

The subject site is situated to the South Eastern zone of the Gregory Hills Corporate Park development with The Hermitage Way to the East and Digitaria Drive to the North and the Riparian zone to the West.

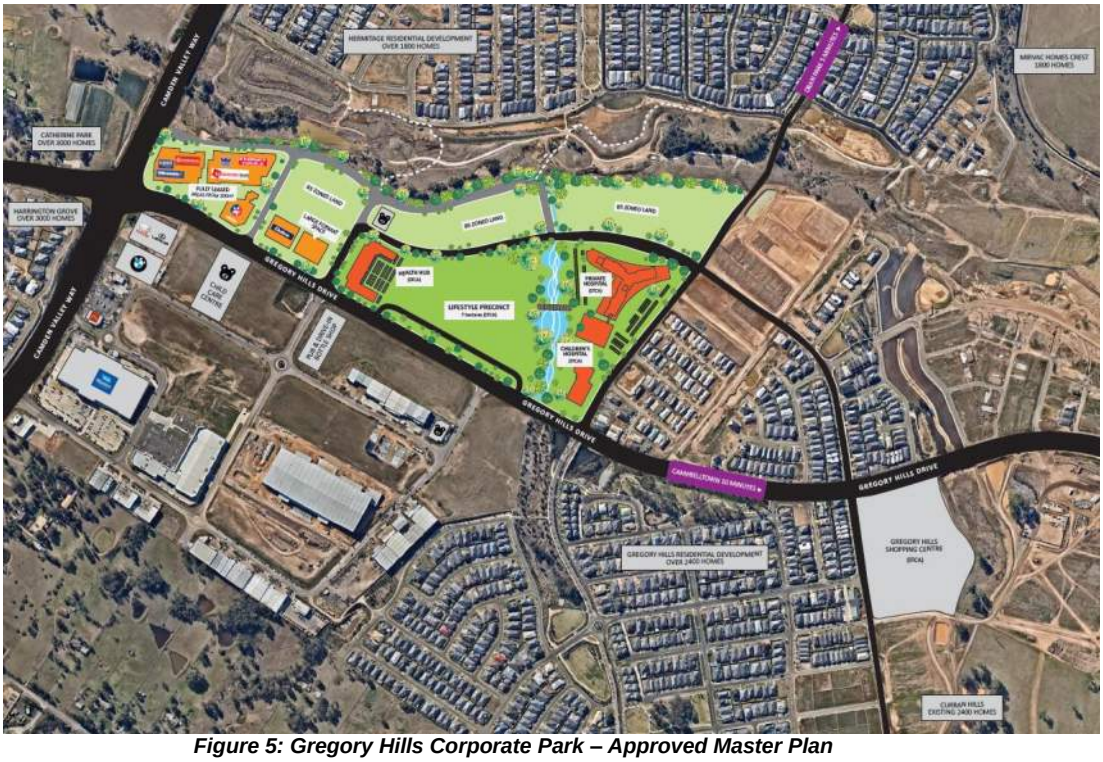


Figure 5: Gregory Hills Corporate Park – Approved Master Plan

1.5 Location Alternatives – Camden Private Hospital

Camden Private Hospital is located with the rapidly growing Camden suburban environment with very good travel access to other major hospitals in South Western Sydney. This ideally positions Camden Medical Campus to cater for the health needs of this dynamic community. Alternative locations could include sites close to either Camden or Campbelltown hospitals. Both of these locations are constrained by cost effective and available land of sufficient size to accommodate the volume and range of services proposed. There are other potential sites to the west, north and south of the proposed site, but none provides more convenient access to a majority of Camden residents or improved linkages to major hospitals.

2 Built Form and Urban Design

2.1 Site Analysis

The following site characteristics and controls have been considered in the process of developing an appropriate architectural response to the clients brief for a private hospital.

Figure 6: Site Analysis Plan

2. Area and Configuration

The total area of the site is 4.2 hectares or 42,000 square metres. It has a length of approximately 260m along The Hermitage Way and approximately 250m along Digitaria Drive. The site can be described as being the shape of a truncated triangle which tapers towards Gregory Hills Drive to the South.

3. Zoning

B5 zoning of the site allows for the development of a private hospital.

4. Topography

The site generally slopes east to west, with the highest point in the north-east and lowest in north-west, which then falls towards the riparian zone in the west.

5. Services

Appropriate services suitable for the development of a hospital on Lot 846 are being developed during phase 4 of the Gregory Hills Corporate Park development. A storm water easement traverses the site parallel to the southern boundary sufficiently within the site has been carefully considered in the proposed design.

6. Ground Conditions

Geological survey indicates suitable sub-grade soil on the site with no significant rock formations.

7. Roads

Existing and new road infrastructure is being established with the development of the Gregory Hills Corporates Park, which service the site on two sides. South of the site Gregory Hills Drive provides access to Campbelltown. The Hermitage Way has moderate to heavy traffic flow to the rest of Gregory Hills and its residences. A roundabout exists at the corner of The Hermitage Way and Digitaria Drive, which has been taken into consideration in the design of traffic flow to and from the hospital within the site.

Figure 7: Roads

8. Acoustics

The primary source of acoustic pollution will be from The Hermitage Way along the eastern boundary of the site. Digitaria Drive will contribute to a far lesser degree to the level of acoustic pollution within the hospital site and buildings. The impact of these sources of noise pollution has been mitigated by maintaining significant set backs from the sources of noise pollution.

In addition the patient ward rooms are located above the podium level on Level 2 and above, being set back even further from the boundaries than the podium is. Proposed vegetation within the setback zone will attenuate noises to and from the site.

9. Riparian Zone

A riparian zone is planned along the western boundary of the site. The design of the hospital takes advantage of the views along this boundary of the site and provides recreational areas for people to enjoy the local flora and fauna. Integration with the natural environment by way of providing opportunities to the hospital community such as the walkway along the Riparian zone, courtyards, outdoor café, and views from the hospital building have been considered an important aspect of the design.

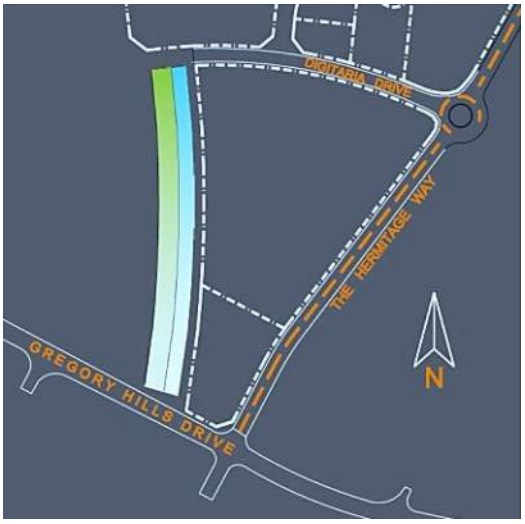


Figure 8: Riparian Zone Adjacent to Site

10. Current Surrounding Uses

The immediate surrounding uses consist of primarily B5 business to the north, west and south of the subject site. Low density residential is located to the east across The Hermitage Way. Both areas have not been fully developed yet however it is expected that these areas will be fully developed in the near future.

2.2 Design Guidelines

Design guidelines and development parameters have been established within the context of the locality and adjoining land. These are:

2.2.1 Site Layout

The site consists of three main building blocks – the Hospital Block, the Medical Block, and the Multi-storey Parking Structure. The Hospital Block and the Parking Structure combine to form the curved back drop on The Hermitage Way. The Medical Block is a separate building functionally connected with the Hospital Block but is primarily accessed from Digitaria Drive. The Hospital Block contains a Medical Wing in the North-West, which houses medical suites and teaching facilities.

Figure 9: Site Master Planning

2.2.2 Gross Floor Area

The site area is approximately 41,450m2, the proposed Gross Floor Area is approximately 73,000m2, having an FRS of 1:1.76, exclusive of basement or multi-storey parking structure.

2.2.3 Building Footprint

The Ground Level building footprint is 18,891m2 (including multi-storey parking structure), representing 45.58% of site coverage. The remainder of the site is dedicated to landscaping or landscaped parking.

2.2.4 Landscaping and Tree Planting and Interface with Riparian Zone

The appropriate landscape strategy has been detailed in the landscape plan. This includes integration strategies with the Riparian Zone. See Chapter 5 for more detailed discussions.

2.2.5 Height

The proposed maximum height is RL 129.10. It is noted that this maximum is a localised occurrence at the roof top lift overrun. The building is of a tower and podium typology. Whilst the tower sits above the podium it is also substantially setback from the edge of the 3-storey podium.

2.2.6 Setbacks

The proposed development on the site maintains substantial setbacks on all frontages. The red dotted lines below represent the 5-metre setback form The Hermitage Way and 3 metres from other boundaries as specified in the Camden Council DCP. A particularly generous setback has been proposed on The Hermitage Way frontage, which faces low density residential lands across the road to the east. From the nearest residential site boundary, the main hospital building is some 29 metres to 75 metres away.

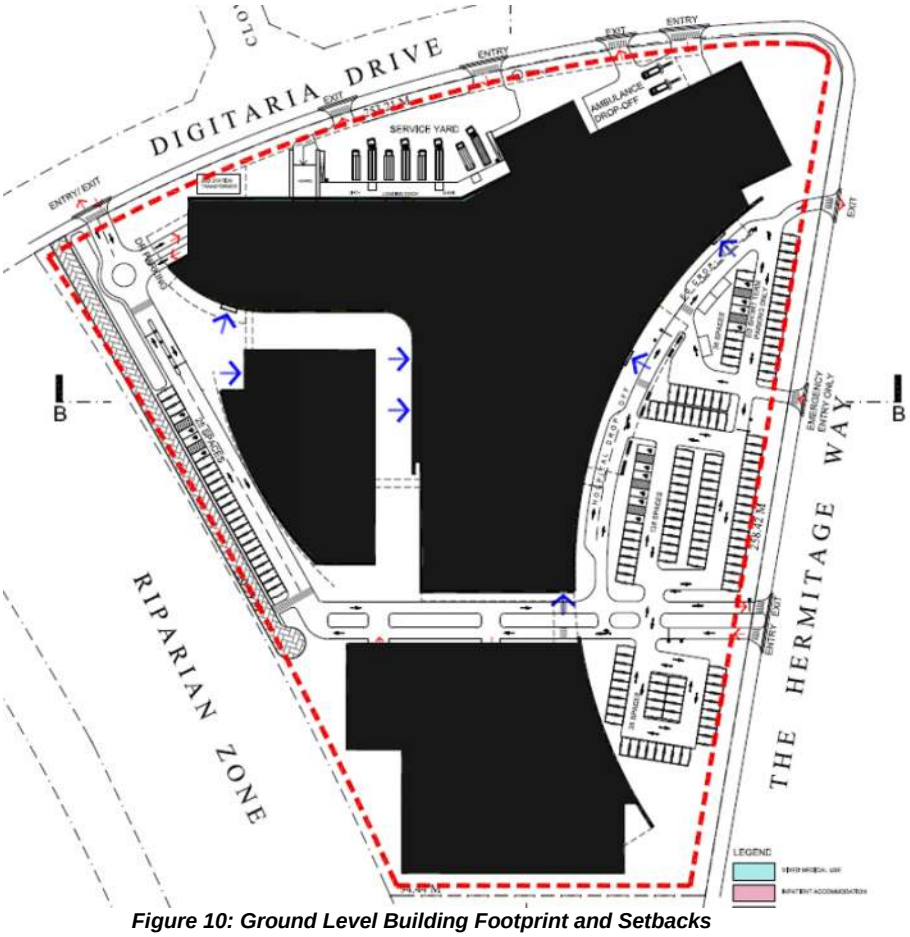


Figure 10: Ground Level Building Footprint and Setbacks

2.3 Building Envelope Study

The proposed building is a highly articulated form that responds to the opportunities and constraints of the site. It seeks to positively contribute to the urban design with the generous setbacks, particular that which faces the residents across The Hermitage Way. The diagram below shows the east-west cross section of the site through to the residential lands. The red zone represents the minimum setback requirements are per Camden Council DCP. The difference is significant on both the eastern and western site frontages, and intentionally so to create a landscaped setting in which the hospital is situated.

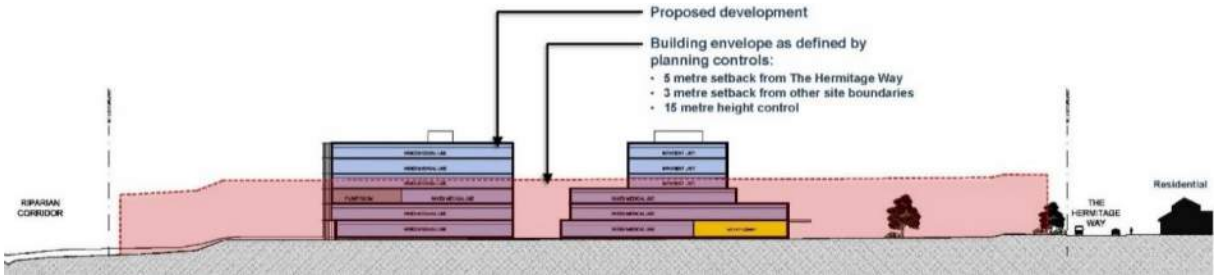


Figure 11: East-West Site Section

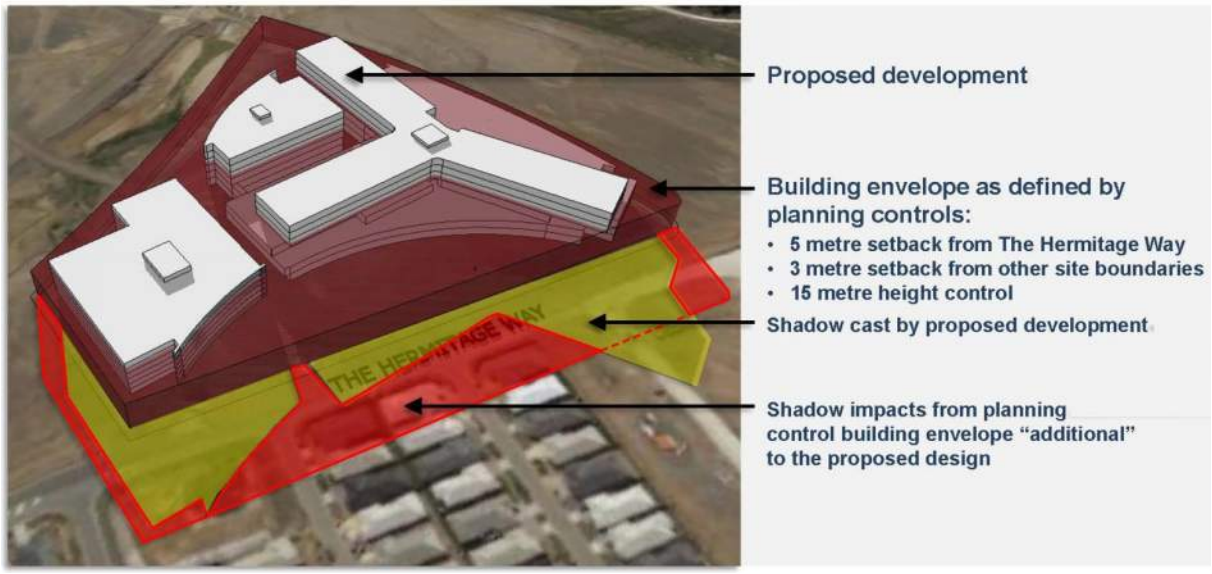


Figure 12: Building Envelope Analysis

2.4 Façade Concepts and Street Frontage

To meet the needs of the growing community of Camden and the Greater Macarthur region, the façade concept provides a contemporary and healing-focused amenity that delivers world class health services and offers an appealing place.

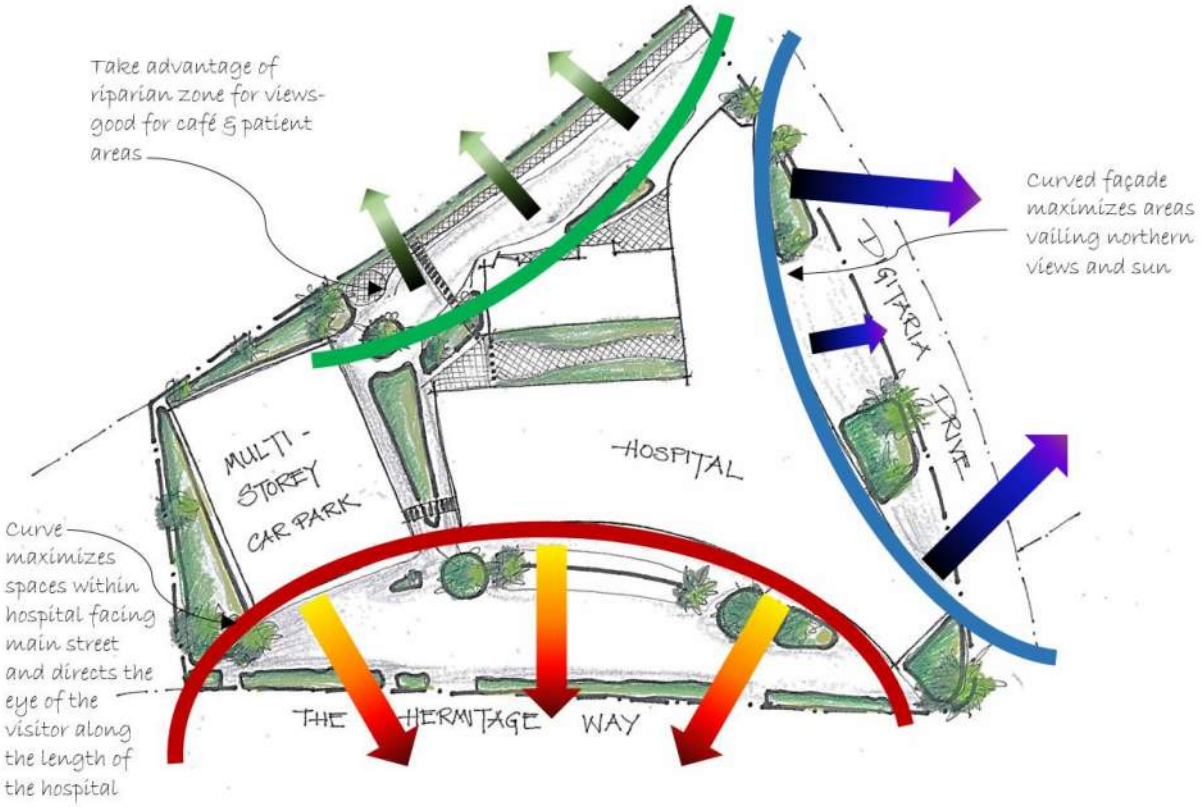


Figure 13: Environmental Considerations on Each Facade

The Hospital projects an “active” street frontage, adding interest, life and vitality to the surrounding areas and the community. This is achieved with the following design considerations:

- The Hospital axis and facades are oriented to follow the alignment of eastern boundary of the site along The Hermitage Way. The intention is to reinforce the street character and provide good visuals of the Hospital from the street. It also improves pedestrian amenity at street level.
- Ancillary retail spaces within the hospital are positioned along the main façade. This helps to achieve an “active” street frontage for the building.
- Street setbacks are determined, not only to provide sufficient traffic access to the hospital and urgent care ward entries, but also to help create street proportions that enhance the building’s setting on the site. The right street setback offers comfortable wind conditions, view corridors, appropriate pedestrian scale, and good growing conditions for trees along the main street.
- Glazed curtain walling is proposed for the majority of the main façade of the hospital. A curtain wall system on a building front is an exterior wall that is attached to the building structure, but is not load-bearing. The curtain wall creates the façade element and forms the weather barrier for the building, without providing support for the structure. As it is non-structural, the curtain wall can be made of lightweight material, reducing construction costs. The glazing helps to control and maximise the amount of natural light entering the building.

2.5 External Views

The Hospital is designed to project a strong street presence with active street frontage along The Hermitage Way. The design proposal acknowledges the corner location, with provisions in place to ease traffic, particularly at the roundabout at the corner of The Hermitage Way and Digitaria Drive.

Figure 14: Indicative Overall View From Across The Hermitage Way*

Figure 15: Indicative View From Corner of Digitaria Drive and The Hermitage Way*

*Figure 16: Indicative View Towards the Main Entry From the SE Corner Off The Hermitage Way**

The views above are indicative only.

2.6 Building Form & Massing

The hospital building is articulated as a podium-tower typology; it comprises a 3-storey podium and a three-pronged tower above. The podium level contains the reception, admissions, surgical spaces as well as the services for the entire building. This necessitates a larger footprint on site for the first three floors (Ground Level, Level 1 and Level 2). The tower is predominantly made up of inpatient ward units branching out in three directions, taking in the views from various angles.

A plant room level is at the top level of the podium (Level 2). It is set back from the main podium below and is differentiated from the podium and tower by material and colour. It is an articulated connecting piece between the tower and podium.

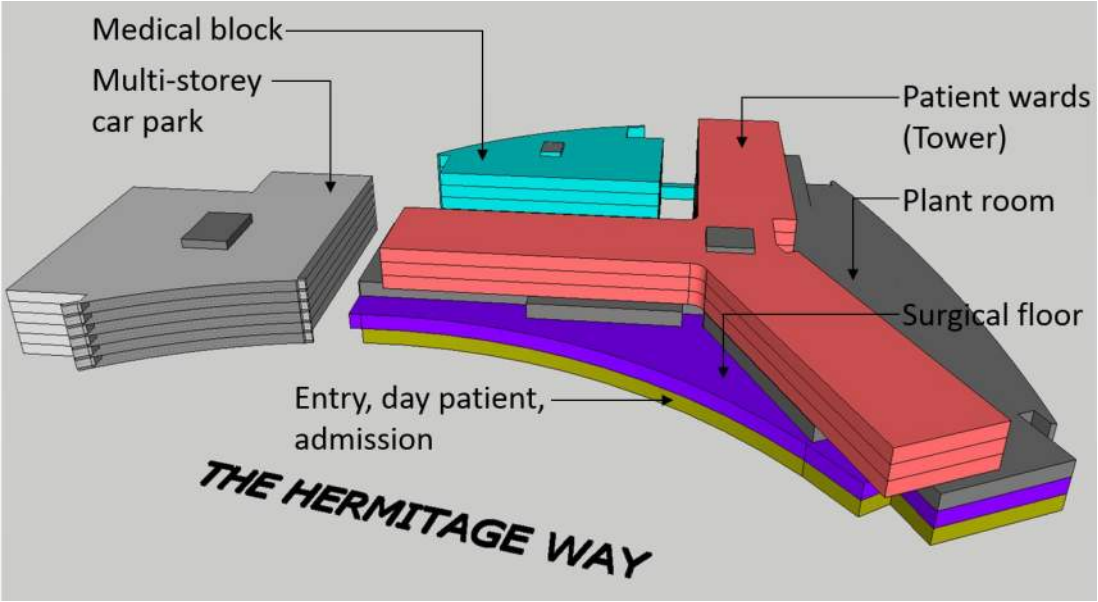


Figure 17: Functional Blocking

2.7 Vertical Zoning

Vertical zoning of the building places prime importance on public and service elevators to connect various areas of the Hospital with one another, particularly Urgent Care on the ground floor with the Operating Suite on Level 1, and the Operating Suite with the inpatient wards above. Vertical relationships of departments and zones of the Hospital allow efficient patient flow and staff movement through the Hospital, minimising distances travelled by moving upwards or downwards to services required. Segregation of public and service elevators minimises congestion and enables the critical uses of the lifts to transfer patients and staff to take priority where required.

The plant rooms for the Hospital and the operating theatres are positioned on Level Two. This allows for a roof space that is free of equipment and therefore can facilitate staged development without unduly affecting hospital operations.

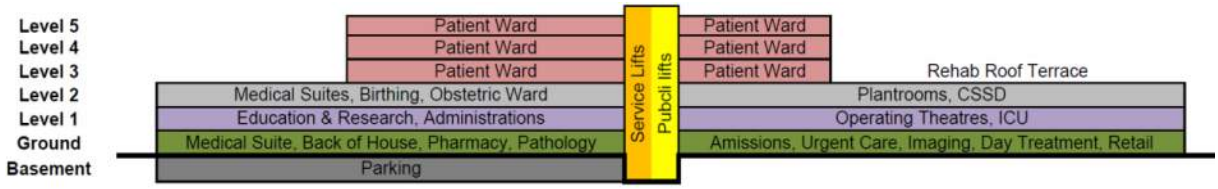


Figure 18: Vertical Stacking (Hospital Block)

2.8 Alternative Architectural Design and Planning

Alternative architectural and site masterplan options have been explored, analysed and measured against fundamental design objectives such as amenities of public domain, planning efficiency, mass, height, formal articulation, traffic and safety…etc. These have ultimately lead to the development of the current proposal. The current proposal represents a well-balanced architectural and planning strategy that will guide detailed design going forward.

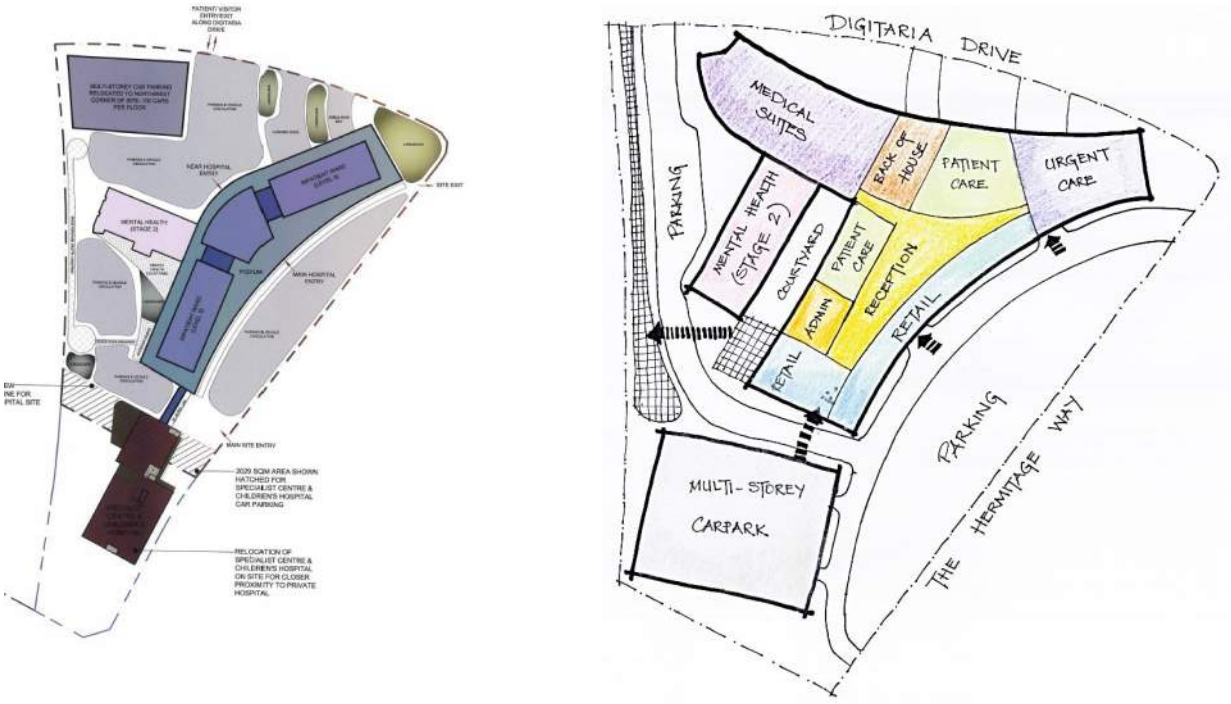


Figure 19: Evolution of Concept Options

3 Environmental Amenity

3.1 Solar Access and Overshadowing

The orientation of the hospital promotes the infiltration of natural daylight into the following areas of the Hospital:

- Patient care and treatment areas, such as inpatient units, recovery areas and consultation rooms.
- Staff areas where staff are located for long durations at a time, such as offices, nursing stations, receptions and patient treatment areas. This helps to promote staff wellbeing and encourage greater productivity.
- Public areas, including corridors, waiting areas as well as the café

At the same time, patients undergoing care are not exposed to excessive temperature, direct sunlight and glare. This will be achieved through passive control measures with the application of insulation, and the use of tinted glazing

Figure 20: Sun Path Over Site on Winter Solstice

Figure 21: Sun Path Over Site on Summer Solstice

Shadow analysis during winter solstice demonstrates that the hospital will have minimal impact on all adjoining lands.

At 9am, shadow is cast on lands to the west (Riparian Zone) and to the south (Parking structure of adjoining health facility subject to a separate DA by others). At 12pm almost all shadow is contained within the subject site. At 3pm small portions of residential lands to the east are impacted, which otherwise remains unaffected by the proposed development throughout the day. The extent the building is set back from the boundaries to the east and west limits the impact on adjacent properties. It is considered that there will be no or negligible impact on the amenity of neighbouring properties.

WINTER SOLSTICE 9AM

WINTER SOLSTICE 12PM

WINTER SOLSTICE 3PM

Figure 22: Shadow Diagrams on Winter Solstice

3.2 Acoustic Impacts on Community

Potential sources of noise generation is from the loading dock and the public patient drop-off area. To some extent ambulances entering and leaving the site will also generate some noise. However, operational policies will dictate noise minimization practices, such as, when appropriate, not turning on the siren until a certain distance away from the hospital. The hospital is surrounded by B5 zones and a riparian zone, which are much less sensitive to noises compared to the residential lots lying to the east.

To minimize noise to the residents to the east, the loading dock and ambulance yards are located on the north of the site off Digitaria Drive. Its immediate neighbours are B5 zoned. The service dock is screened by the hospital building itself such that noises can be contained. To the east the generous setback creates a highly landscaped setting to absorb sounds as patients enter and leave the hospital, which is not a noisy activity in itself and is further moderated by the appropriate landscaping.

3.3 Privacy and View Loss Impacts

The subject site does not form an identified view corridor or obstruct any significant views shared by the community. It is sufficiently setback from its boundaries to allow landscaping to form the street edge, thereby softening views along surrounding streets.

The patient wards are located on levels 2, 3, 4 and 5. These have generally arranged to face north and south, away from the residential areas. Where it faces east towards the residents to the east, the windows are setback approximately 60 metres from the eastern boundary at the closest point, and a further distance of approximately 19 metres to the street boundary of the closest residential lots to the east. As such there are no adverse privacy impacts as a result of the proposed development.

3.5 Pedestrian Wind Comfort and Safety

Pedestrian wind comfort and safety within and surrounding the site has been assessed and mitigated. The effects of wind tunnel through the narrowing of wind passages and downdraft from uninterrupted tall vertical faces have been identified as the potential source of issues. Strategies for mitigation can be summarized in the diagrams below:

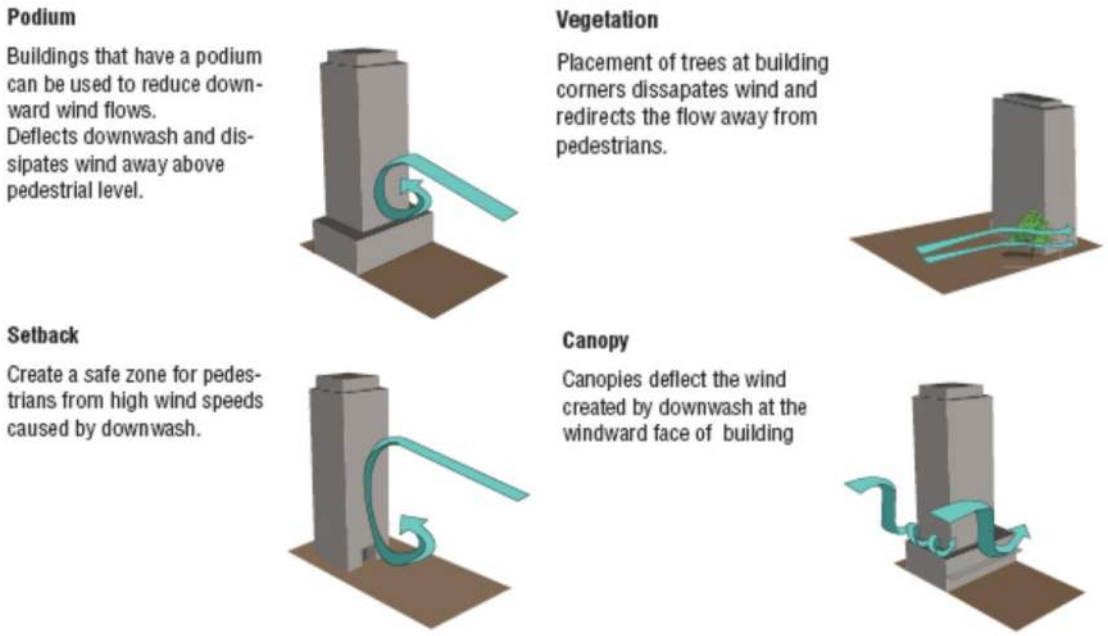


Figure 23: Wind Mitigation Strategies

Podium
A podium with a footprint wider than the tower has been proposed to break up continuous vertical faces and wind paths.

Setback
Setbacks from site boundaries are generous and vary such that pedestrian along the site boundaries are not subjected to wind deflected off the building.

Vegetation
Trees and shrubs have been proposed across the entire site to dissipate winds within the on-grade parking area and along street frontages.

Canopy
Canopies have been proposed along main paths of pedestrian movements as weather shelters and wind deflectors.

In addition, gaps between buildings have been orientated away from the cold south-easterly or have been protected from wind tunnel effects by clustering buildings to form mutual wind screening.

4 Site Access & On-site Parking

4.1 Site Access, Parking

The principal site entry to the hospital and urgent care wards drop-off zones are via The Hermitage Way. A total of 135 car spaces are located in front of the Hospital, including parking for short-term urgent care. A multi-storey car park of six levels plus a roof deck parking is proposed on the site with the capacity for 118 car spaces on each level. A covered walkway provides pedestrian access from the multi-storey car park to the Hospital entry lobby and retail spaces.

Entry to the Medical Suites in the north-eastern wing of the hospital is via an entry/exit point off Digitaria Drive. A total of 25 car spaces have been provided towards the western boundary of the site for short-term outpatient visitor and patient parking.

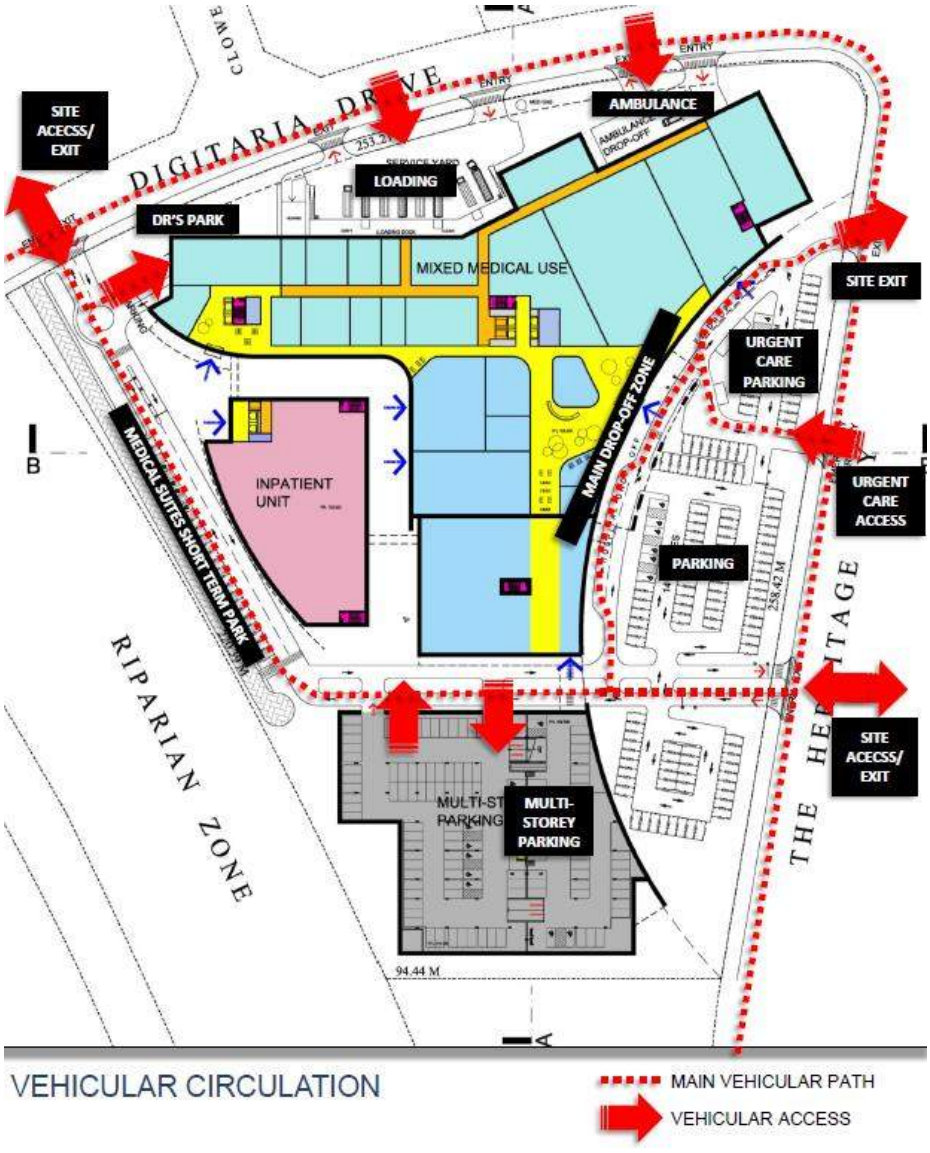


Figure 24: Vehicular Access and Circulation Within the Site

Provisions are made in the design for an underground carpark for doctors and surgeons. The natural gradient of the site allows for basement access from the north-western entry to the site beneath the Medical Suites. A total of 76 car parking spaces can be accommodated with access to both sets of public and service lifts. The multi-storey parking structure at the southern end of the hospital will provide an additional 844 car spaces. It is accessible from both public entry points to the site. The two entries (East and North-West) are

interconnected with an internal driveway for optimal flexibility. In total, 1,080 car spaces can be provided, plus some spaces for bike parking. Accessible parking spaces have been provided.

Entry and exit points for ambulances and emergency vehicles are located along Digitaria Drive. This allows ambulances exclusive access to the Urgent Care Ward within the Hospital away from the general public traffic entering from and exiting the site onto The Hermitage Way.

In a similar fashion, trucks have been designated entry and exit points onto Digitaria Drive. This serves not only to give trucks convenient and unhindered access to the loading dock without having to merge with the visitor traffic to the Hospital, but may also help to keep large trucks away from The Hermitage Way as much as possible.

A dedicated Loading Dock is provided with sufficient space for trucks to manoeuvre and reverse onto the loading platform.

4.2 Pedestrian Access

Pedestrians will have unobstructed access along the public frontages of the site. Where driveways cross site boundaries the appropriate pedestrian crossings and signs will be installed for safety. Within the site similar strategy is used to define a safe, efficient path of pedestrian movement.

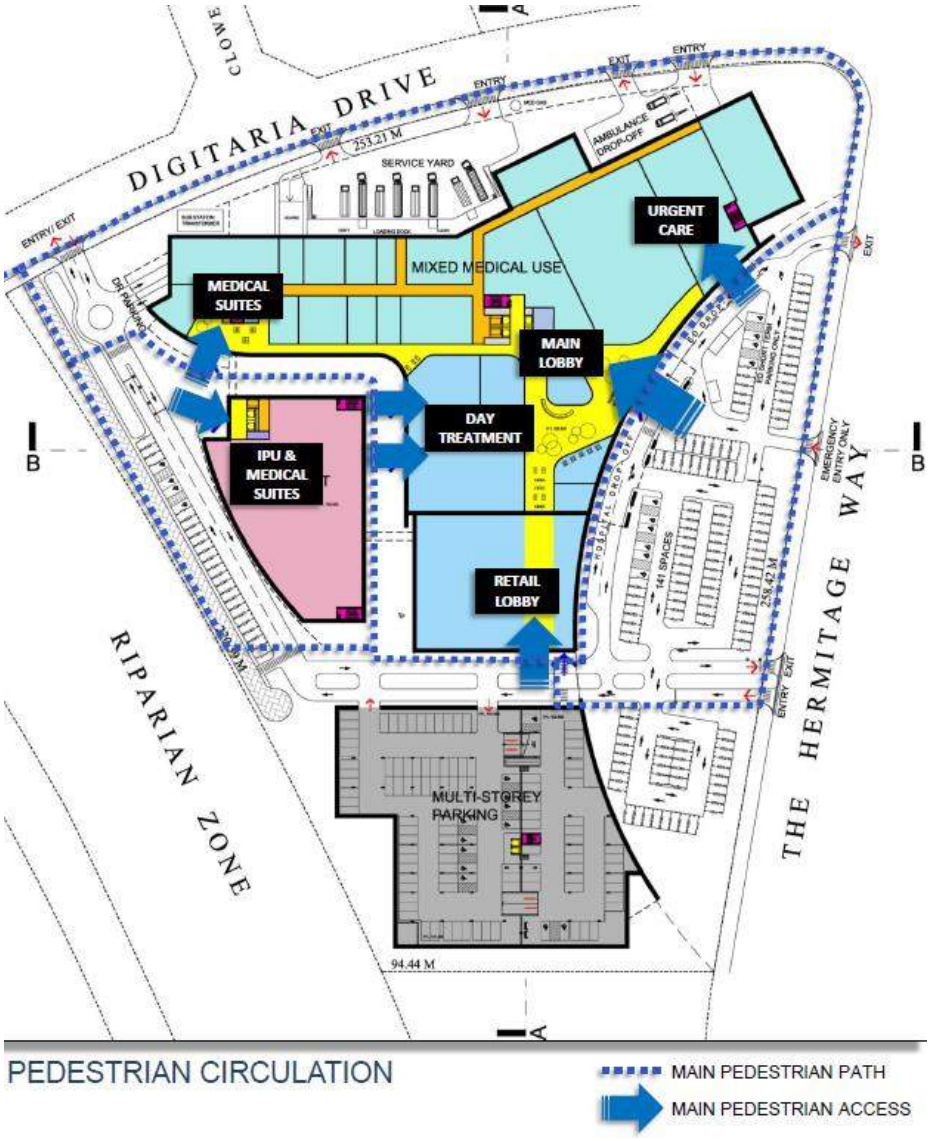


Figure 25: Pedestrian Access and Circulation Within the Site

5 Landscaping

The landscape design within and around the Hospital is prepared with the objective of enhancing the development and responding to the streets surrounding the site as well as the neighbouring areas.

Streetscape works include the planting of trees and hedges covering the length of the eastern site boundary along The Hermitage Way. This serves to complement the visual aesthetics of the hospital as well as an acoustic buffer between the Hospital and the infrastructure overlooking The Hermitage Way. The new tree and hedge plantings will seek to continue the theme of existing landscaping in the areas surrounding the site to promote continuity. This creates pleasant views through The Hertimage Way streetscape works to major entry points. Vegetation along Digitaria Drive serves as an acoustic and visual buffer to the service zone of the hospital.

The proposed planting species throughout the site is primarily selected based on hardiness, ease of maintenance and proven viability in the area. This will be achieved through the use of indigenous canopy plantings and the inclusion of flowering understorey planting. Of importance are foliage characteristics as well as flowering patterns throughout the year.

Regular planting of similar species allows for ease of maintenance with regard to fertilising, pruning and pest treatment. Certain types of indigenous planting may be selected for their ability to attract native bird life. Exotic plants can be incorporated if it proves to maintain consistency with the general character of the locality.

The landscaping strategy intends to establish a distinct native character across all areas of the site. The landscape will be designed in a manner that respects the use of natural resources and is efficient in terms of energy required for installation and ongoing maintenance

Figure 26: Landscape Plan

6 Key Medical Design Principles

6.1 Patient-Centred Care

Zoning within the Hospital will achieve the following design objectives:

- Dedicated car parking and convenient access for visiting doctors to outpatient and inpatient clinical areas
- An easily accessible main entry for the Hospital with clear directions to other facilities and departments. The main reception desk is easily identifiable on entering the Hospital or via the multi-storey car park.
- Strategic locations of ancillary retail spaces that place them away from clinical areas yet in close proximity to the main entry and reception.
- A separate drop-off and entry for an urgent care ward externally. Access to the urgent care ward is also provided internally, with an easy path from the main reception area.
- Reduced walking times for visitors, patients and staff between the clinical and non-clinical spaces
- Clear segregation of public and service corridors.
- An optimal location of public and service lifts to facilitate the most efficient working of the Hospital.

To maximise efficiency within the Hospital, the following health planning guidelines are taken into consideration:

a) Clustering of services to promote patient comfort and value

- Clear travel, flows and relationships between inpatient and outpatient spaces
- Clearly definable “hot zone” for the provision of critical and urgent care services
- Integrated chair-based therapies
- Separation of public, inpatient and staff service flows
- Education and research facilites within the Hospital with access to operating theatres and patient wards
- Generous provision of lounges, meeting and teaching rooms to promote a collegial and learning environment for clinicans

b) High Value and Profitable Care Delivery Systems

- Strong focus on ambulatory and outpatient care
- Walk in – walk out clinics
- Day only surgery suite
- Day of surgery admission
- Minimally invasive and robotic surgery
- Ambulatory chemotherapy and renal dialysis
- Overnight care focused on limited and decreasing lengths of stays
- Promotion of self-help facilities for patients and visitors

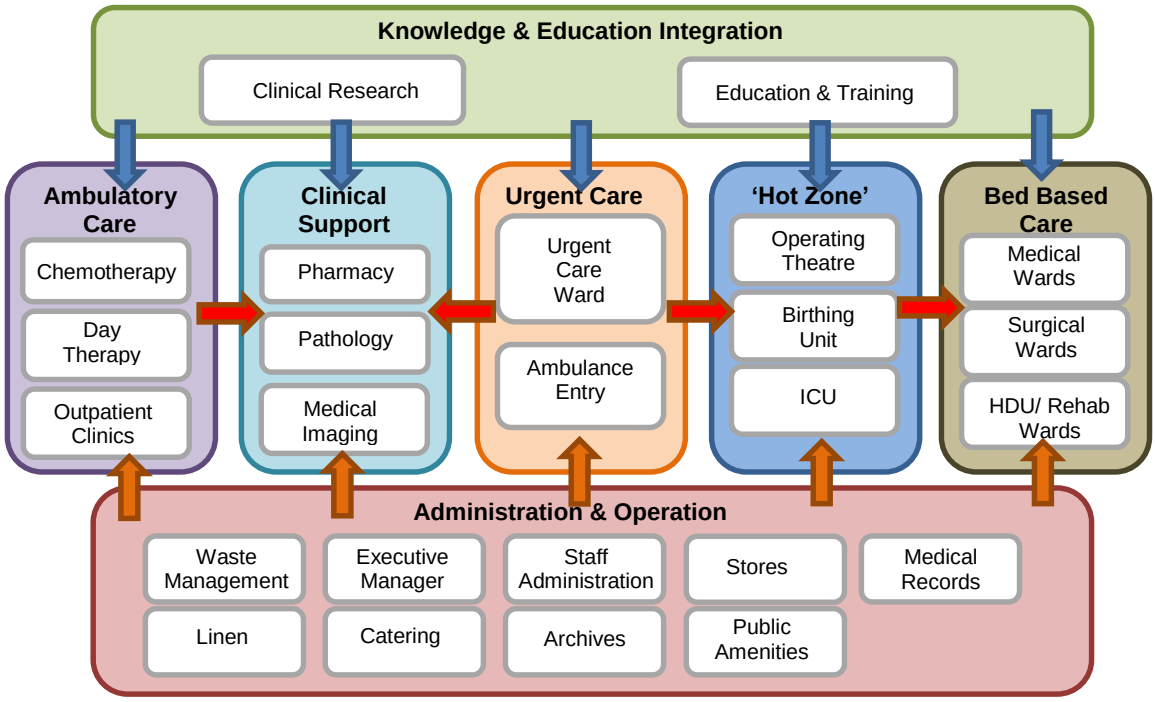


Figure 27: Zoning Principles

6.2 Design Flexibility

Flexibility is designed right into the fabric of the building by an inherent simplicity of building modules. A uniform 8.4 metre grid has been adopted on the podium level, with level 2 being the structural transitional level to take a more efficient, 7.2m grid for the inpatient wards in the tower. These grids have proven to be capable of coping with the pattern of operating room modules, two back to back patient bedrooms, and isolation rooms with adjacent ante-rooms, large meeting rooms and even for car spaces in the basement car park.

The three-spoke wings on the ward levels have been designed with open ended geometry to allow for staged development without destroying the architectural integrity of the building.

Locations of fixed elements such as fire stairs and lifts are such that they do not prevent future growth. Typical room types such as bedrooms, consultation rooms and patient bays are designed as standardised modules without unnecessary variations that limit the room's functionality and adaptability. This serves an added purpose of keeping staff errors to a minimum whilst giving the hospital management flexibility to use the same space for a variety of purposes. These standardised rooms can be fully designed in great detail, mocked up and verified, then repeated without variation. Modular design makes them interchangeable and adaptable.

A successful Master Plan gives a glimpse of the future which means that every element needs room to grow and remain structurally flexible to allow for internal change. One technique employed successfully involves placing non-critical departments in the space between critical departments. When the Hospital requires quick and disruption-free internal growth, the non-critical departments provide internal expansion space; an example of Operating Suite on Level One of the Hospital.

7 Ecologically Sustainable Design

Buildings account for one third of global carbon emissions providing those in the building industry an opportunity to have a major impact on reducing said emissions. In particular health facilities contribute significantly more to this degradation. This is due to a number of factors, primarily the relatively large structures associated with health facilities and secondly the high level of constant energy usage required for the operations of these facilities.

The carbon footprint of building products and construction processes contribute only 10% of the total lifecycle carbon foot print of a building, while approximately 90% of a building's environmental impact is due to the use of energy during operation for heating, cooling and lighting. This is not to imply that the use of materials and processes during construction, which are environmentally sustainable and considered less important. The implication though is that the life cycle costing exercises undertaken to determine which ecologically sustainable development (ESD) initiatives to implement for any particular project, will generally point to significant financial benefits from energy management during operations of the facility. Therefore ESD solutions which limit recurrent costs are regarded as high priority.

Some of the measures which promote energy and water savings in previously completed health facilities are:

- Hybrid air conditioning systems
- Thermally efficient façade design
- Solar pre-heat hot water systems
- Grey water reuse
- Rain water harvesting

These generally represent the easiest choices for incorporation into the Hospital since they deliver significant long term financial benefits despite higher initial capital costs. The decision making process in establishing which ESD measures to be adopted typically include;

- Meeting statutory minimum requirements
- Comparison between ESD initiatives and adopting options which also save operational costs

Outcomes must be verifiable, not theoretical. The most common are:

- Building features to reduce thermal load
- Heating, ventilation and air conditioning options to reduce energy use
- Electrical options to reduce energy use
- Water conservation

Other common initiatives include:

- Daylighting: allowing maximum amount of sunlight into the building during the day, through windows, courtyards
- Installing solar panels at optimum orientation
- Installing more efficient lighting such as LED (light emitting diode) lights throughout the Hospital
- Installing lighting controls like motion sensors in rooms that are used infrequently, such as teaching facilities, store rooms and utility rooms
- Installing variable speed drives for fans or pumps
- Improving the overall maintenance schedules of building systems
- Installing an energy efficient heating and cooling system

One possible façade system for the hospital is a double or triple paned glazed curtain walling system. Double-pane and triple-pane glass panels can effectively enhance thermal performance in the curtain wall. A double-glazed panel combines two glass panels, creating an air space between the panels, while a triple glazed panel has two separate air spaces. Use of these panels provides improved insulation and condensation control, and allows for between-glass shading options, such as integrated venetian blinds or pleated shades.

Double-skin systems, which use a ventilated space between the inner and outer walls, are becoming increasingly popular in Australia. The ventilated space helps conserve energy by balancing the temperatures surrounding the curtain wall. During the winter season, the space acts as a buffer between the exterior and interior and can be used to temper the cooler outdoor air. During the summer months, warm interior air is exhausted into the ventilated space.

8 Staging Plans

Through smart Master planning, efficient health service and facility planning, the proposed design provides the strategies and framework for staged development. It enables the facility to grow in an orderly fashion whilst the construction stages will have minimal impact on the daily activities of the operating hospital. This section contains diagrams and discussions that form an indicative proposal for staged development.

Figure 28: Staging Plans

8.1 Stage 1

Stage 1 consists of core health services and their support functions, which may include, Surgical Services, Imaging, Urgent Care, Nuclear Medicine, Pharmacy, Day Treatment, Day Ward, Birthing, ICU, Pathology, Waste Management, Supplies Unit, Linen, Kitchen, Medical Suites….etc.

8.2 Stage 2

Stage 2 increases the provision of health services, particularly in the number of patient beds. As such parking demands is expected to increase. The lower levels of the multi-storey parking structure may be constructed at this stage to meet the demand. One additional inpatient tower level may be required to house the increase in patient beds. A new medical block ancillary to the hospital block may be constructed between the wings of the hospital block to provide additional services.

8.3 Stage 3

Stage 3 is a further enhancement of the overall health services provisions. The hospital block may grow horizontally within the site towards the multi-storey marking structure and the B5 zones to the north.

The inpatient towers may have additional floors. Both the parking structure and the medical block may be added to vertically.

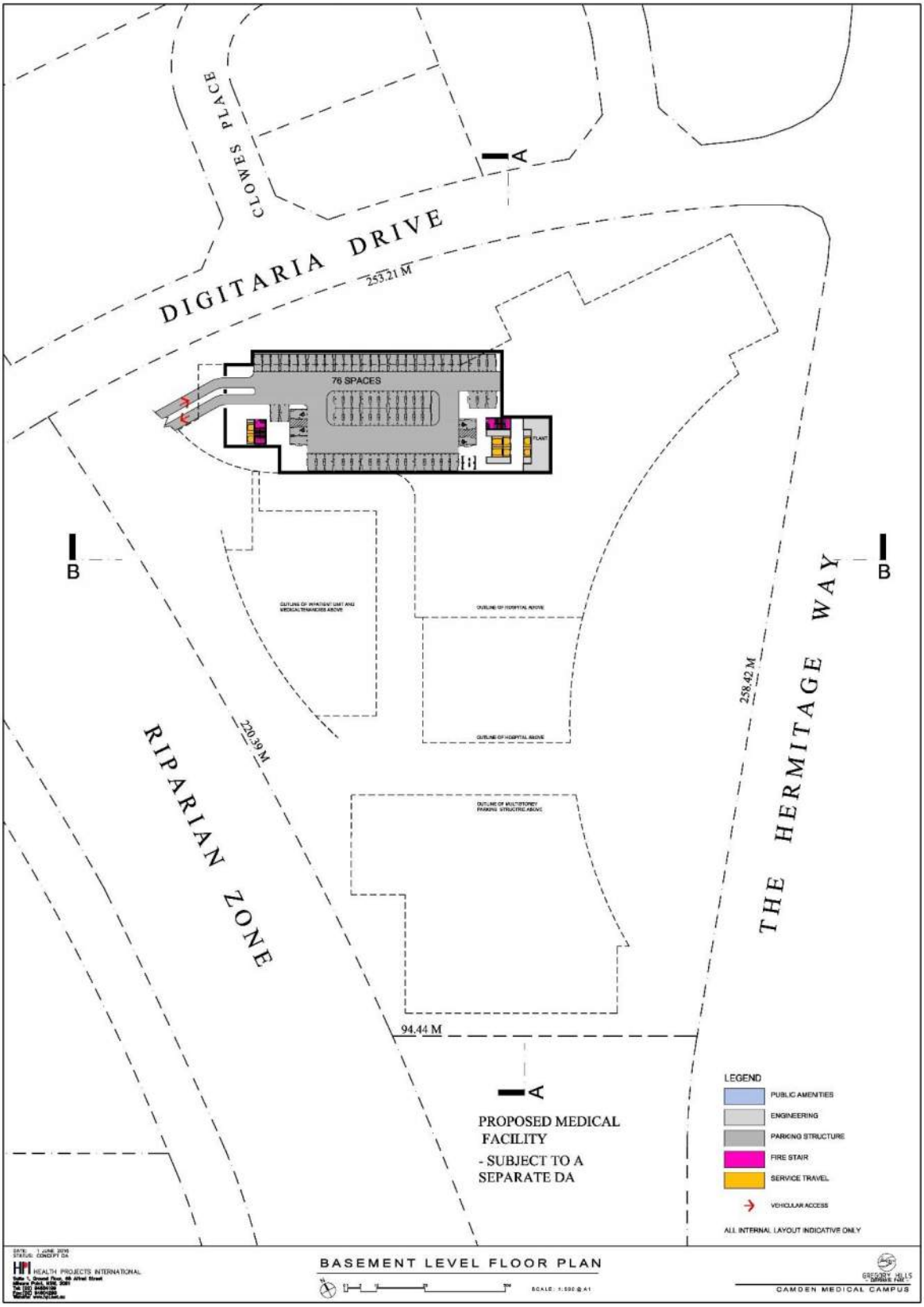
It is noted that Stage 3 development will not encroach the generous landscaped setback from The Hermitage Way established in Stage 1.

9 Appendix A: Summary of Figures and Tables

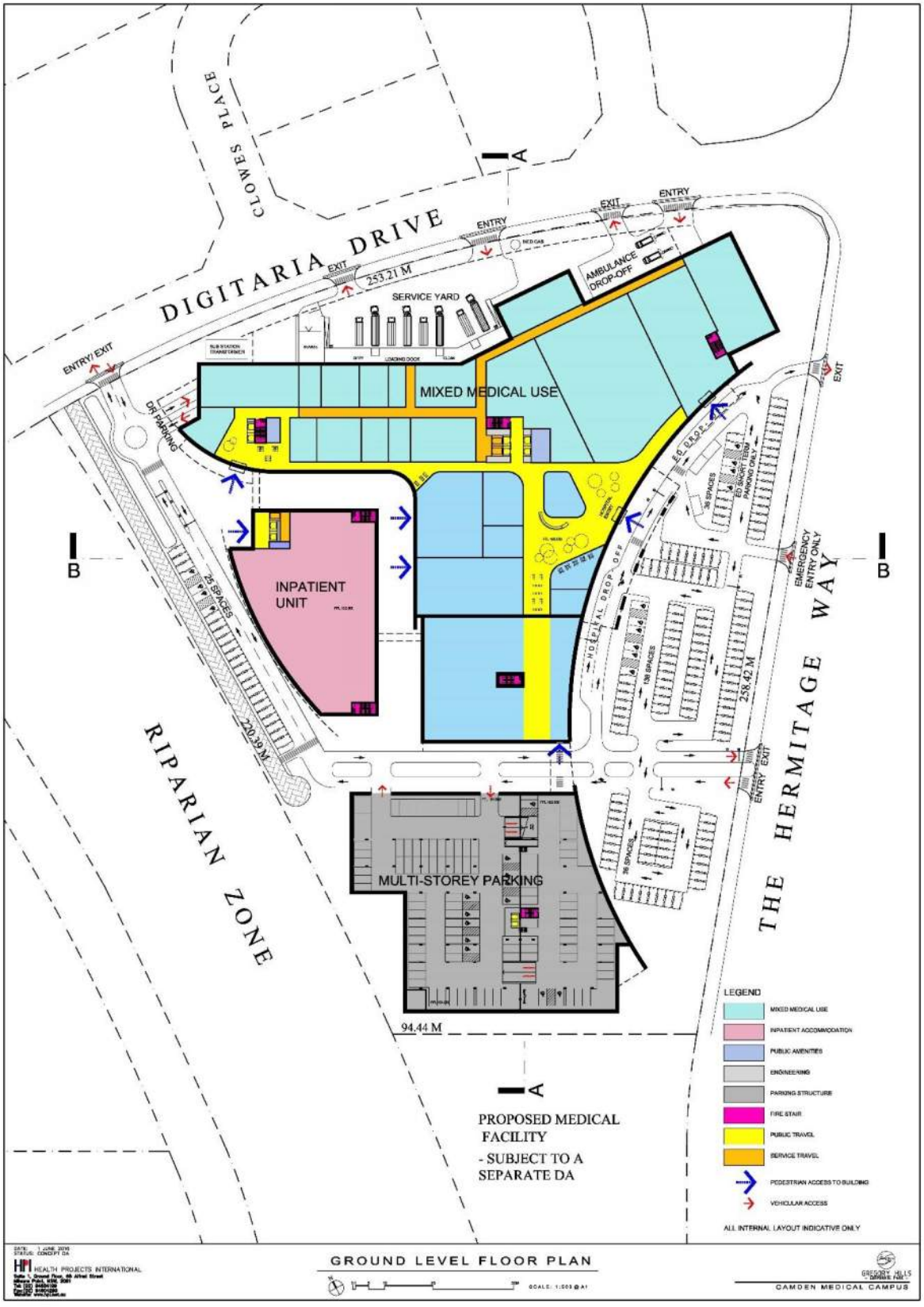
Figures

10 Appendix B: Floor Plans

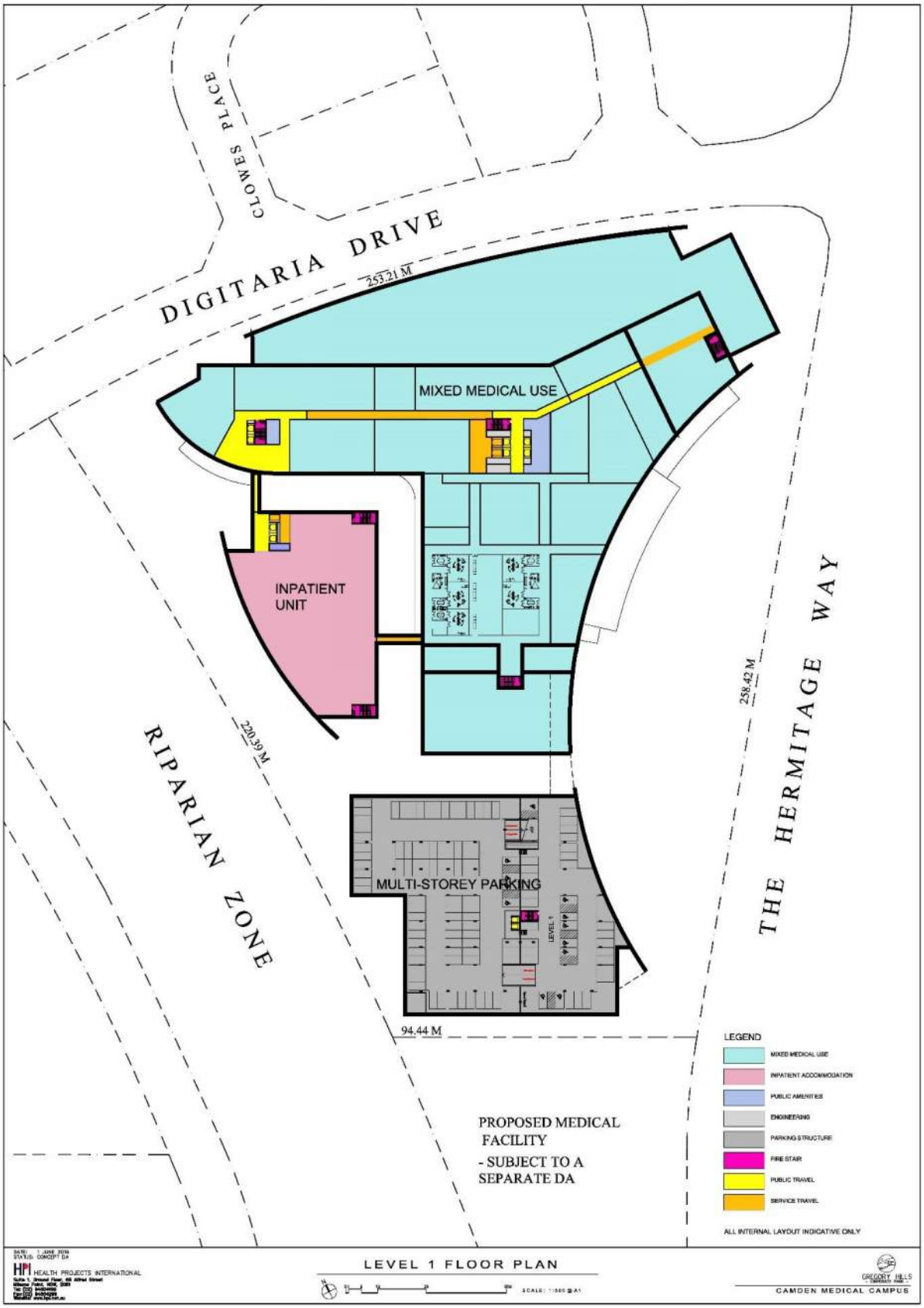
10.1 Basement Floor



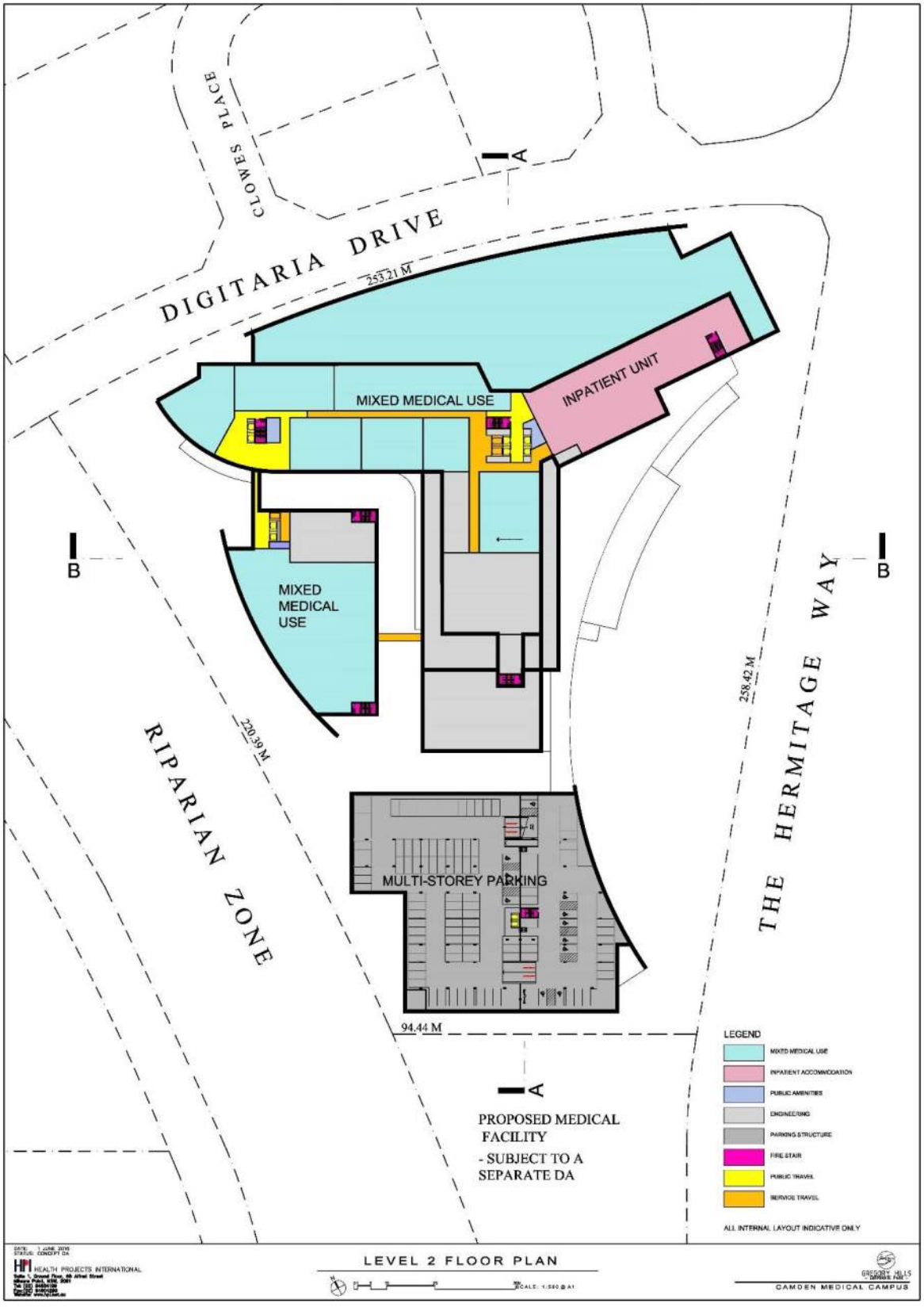
10.2 Ground Floor



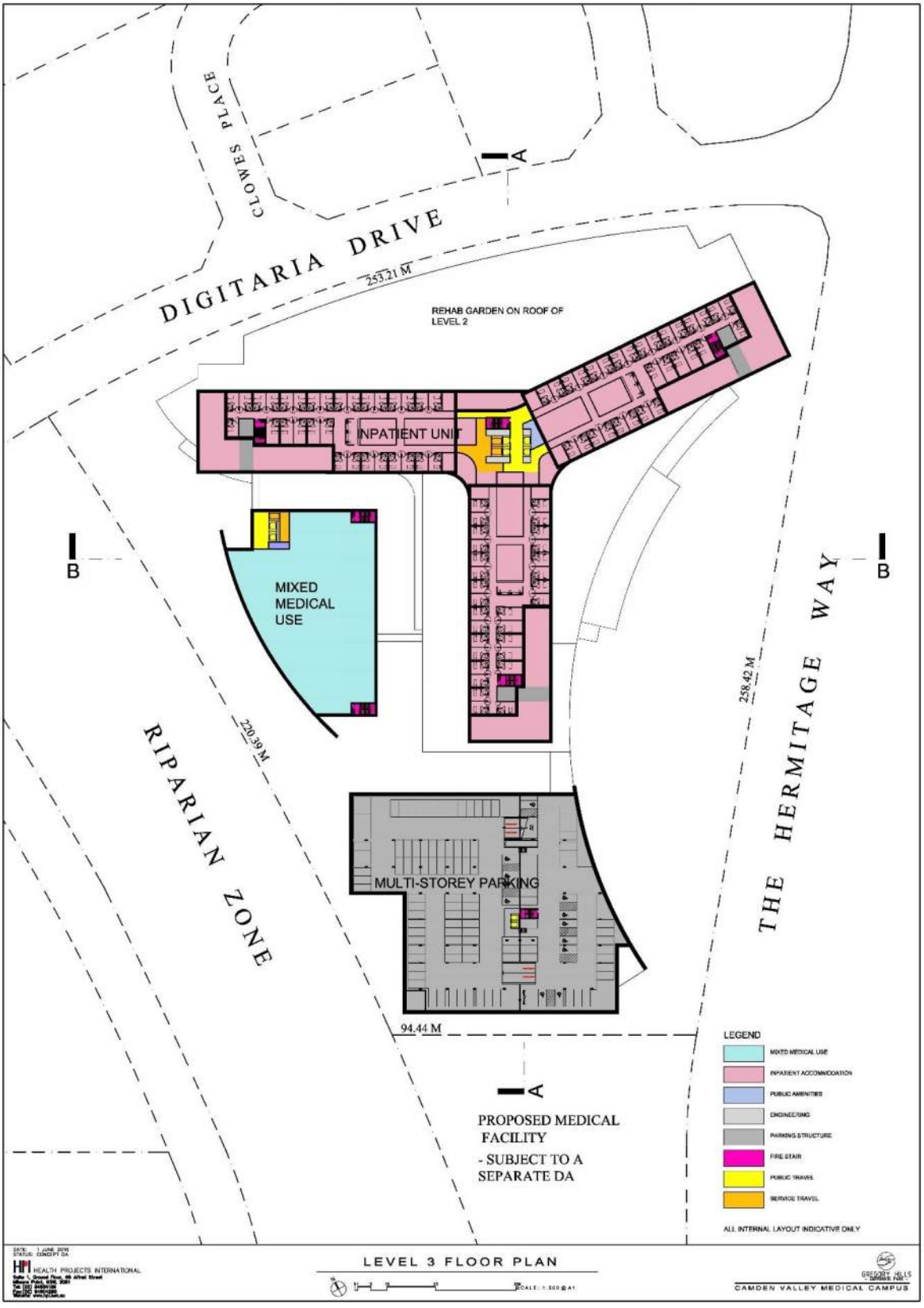
10.3 Level One



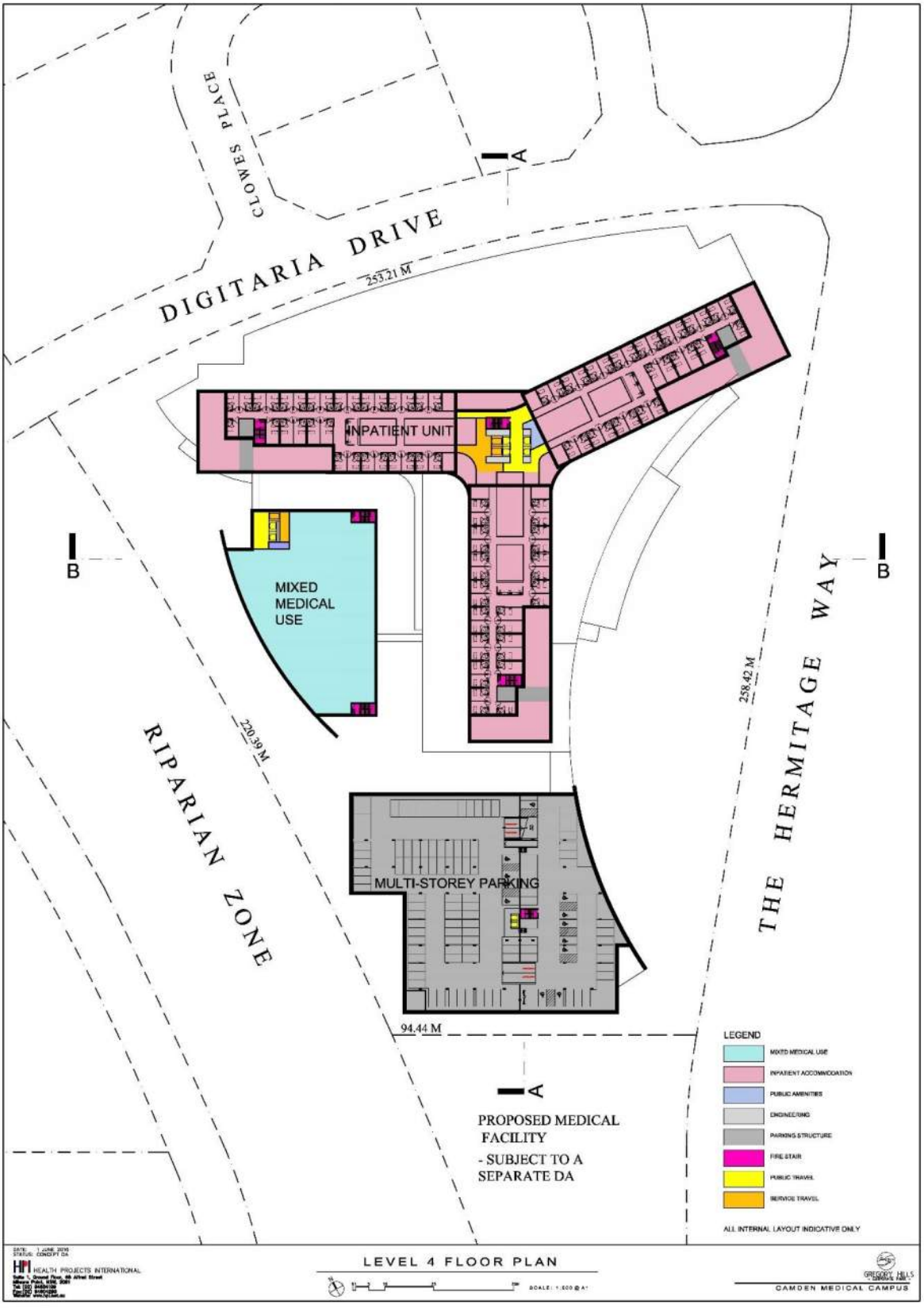
10.4 Level Two



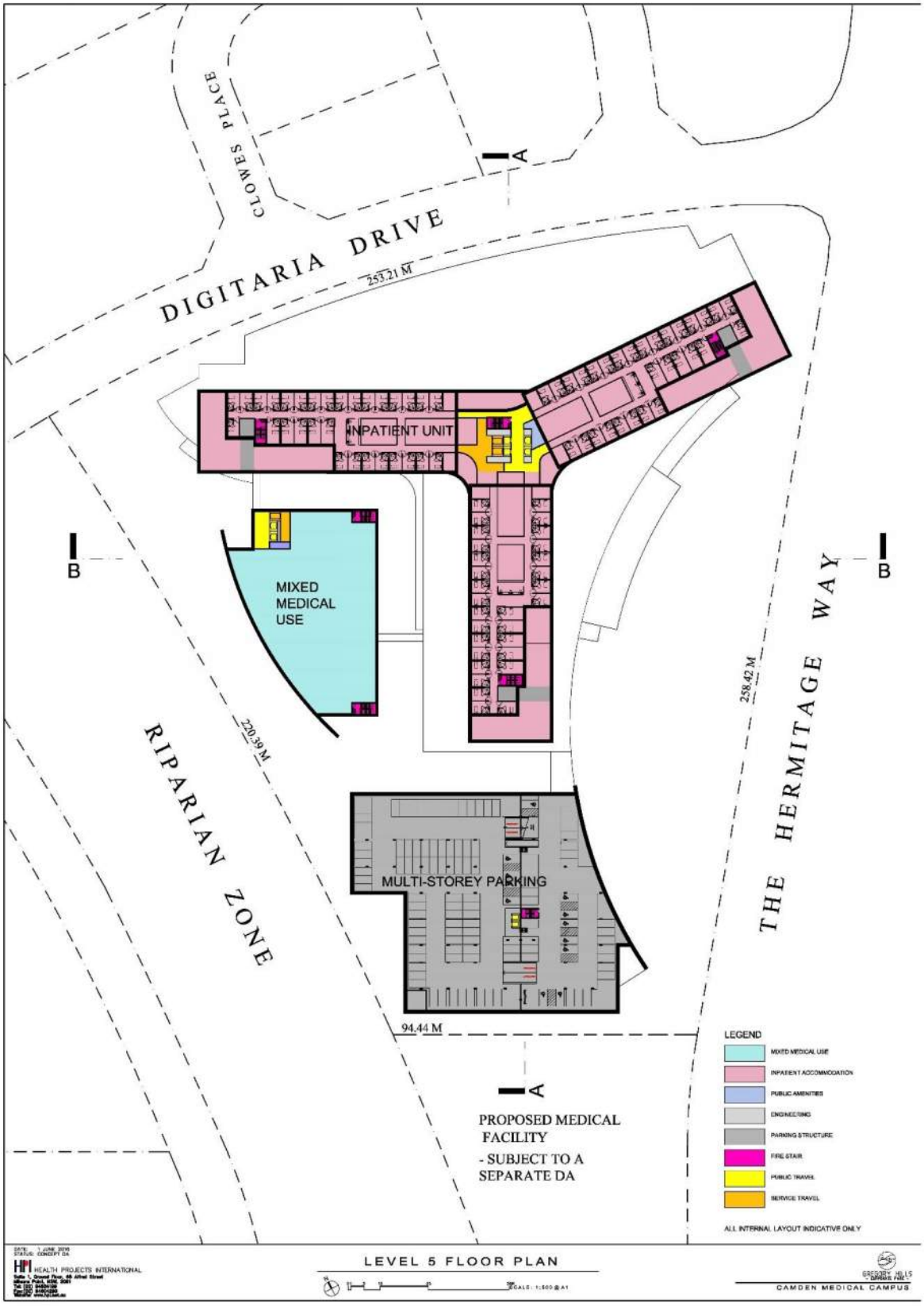
10.5 Level Three



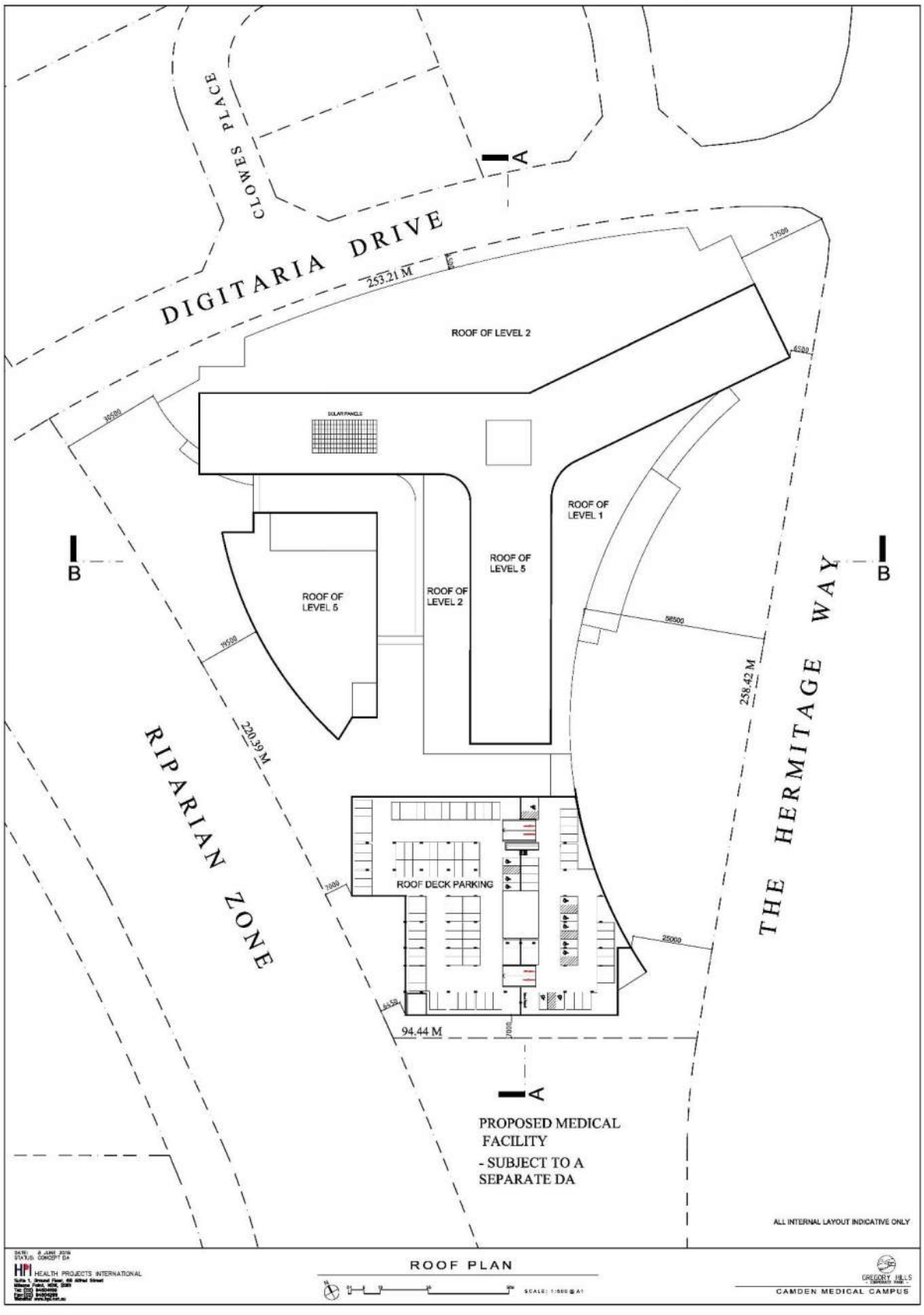
10.6 Level Four



10.7 Level Five

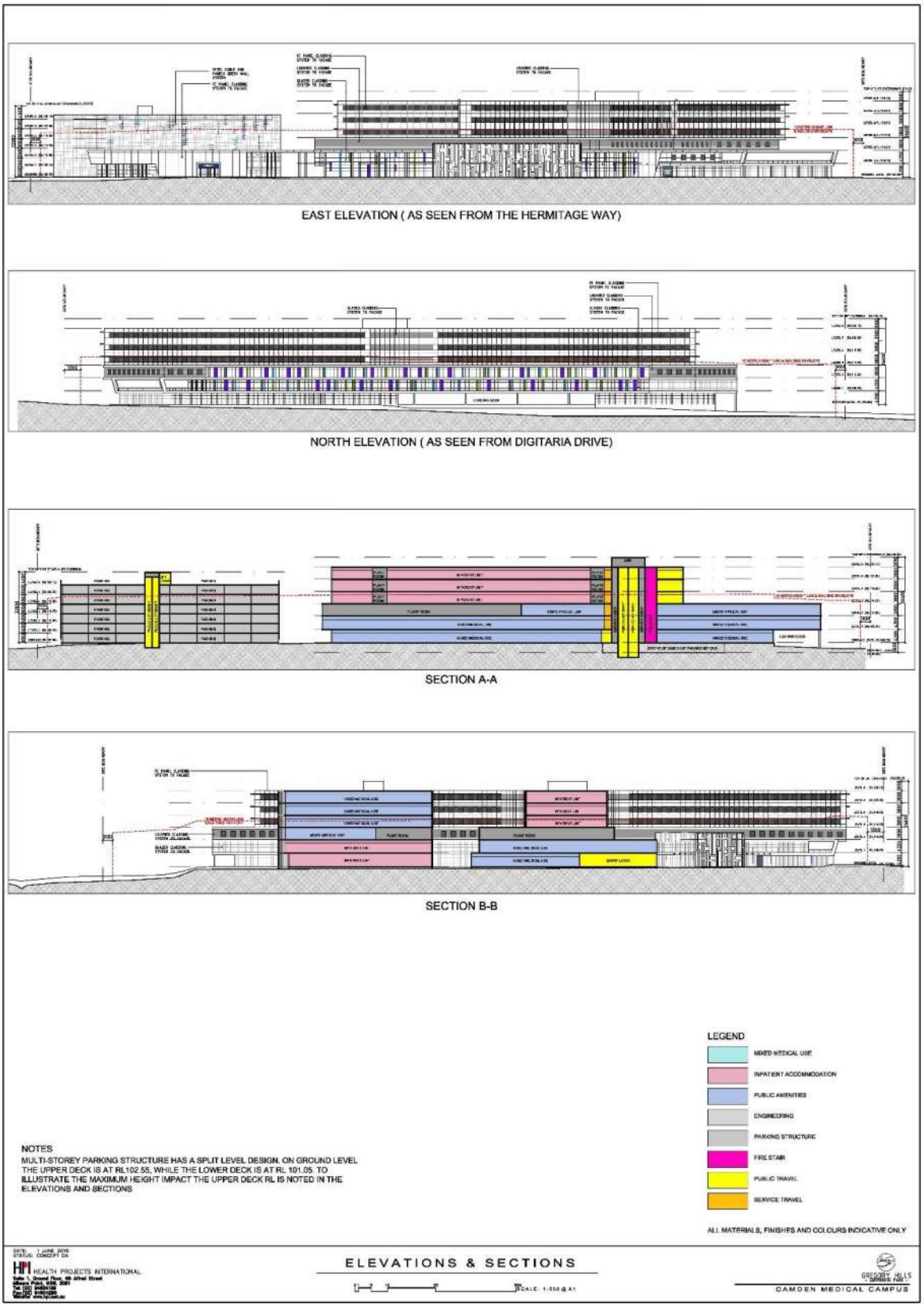


10.9 Roof Plan



11 Appendix C: Site Plan

12 Appendix D: Sections and Elevations



13 Appendix E: Staging Plans