

CONTENTS

1 INTRODUCTION				
1 - 01	INTRODUCTION			
1 - 02	DEVELOPMENT OVERVIEW			
1 - 03	AREA SCHEDULE			
1 - 04	DESIGN PRINCIPLES			
2 THE SITE				
2 - 01	LOCATION			
2 - 02	CONTEXT			
2 - 03	PRECINCT SITE ANALYSIS			
2 - 04	PRECINCT SITE ANALYSIS			
2 - 05	PRECINCT SITE ANALYSIS			
2 - 06	SITE ANALYSIS			
2 - 07	SITE ANALYSIS			
2 - 08	SITE ANALYSIS			
2 - 09	SITE SURVEY			
2 - 10	SITE PLAN			
2 - 11	GROUND PLANE			
3 DESIGN RATIONALE				
3 - 01	OPTIONS ASSESSMENT			
3 - 02	MASSING & BUILT FORM			
3 - 03	BUILDING MATERIALITY			
3 - 04	ENVELOPE & FACADE			
3 - 05	COMPUTER GENERATED IMAGERY			
3 - 06	ACCESS & CIRCULATION			
3 - 07	ACCESS & CIRCULATION			
3 - 08	ACCESS & CIRCULATION			
3 - 09	ACCESS & CIRCULATION			
3 - 10	SERVICING, WASTE & LOADING			
3 - 11	BUILDING PLANT STRATEGY			
3 - 12	LANDSCAPE STRATEGY			
3 - 13	SIGNAGE STRATEGY			
3 - 14	FUTURE EXPANSION & FLEXIBILITY			

4 ENVIRONMENTAL IMPACT

4 - 01	HEIGHT, BULK & SCALE
4 - 02	SETBACKS
4 - 03	ENVIRONMENTAL IMPACTS
4 - 04	VISUAL IMPACT ASSESSMENT
4 - 05	VISUAL IMPACT ASSESSMENT
4 - 06	SUSTAINABILITY
4 - 07	CPTED
4 - 08	GA NSW REVIEW PROCESS

NOTE

This Design Report is to be read in conjunction with the Architectural Drawing Set included within the SSDA submission.

INTRODUCTION

BACKGROUND

The South Western Sydney Local Health District Clinical Services Plan for Liverpool Hospital to 2031 (CSP) has identified key drivers facilitating the upgrade of Liverpool Hospital.

Theses drivers primarily relate to population growth within the Local Health District, access issues and capacity, meeting the future care needs of the South West Sydney and addressing the substantial population health issues

Liverpool Hospital is a Principal Group A1 tertiary referral academic and research focussed acute hospital. It plays a role as a District hospital for the local catchment of the Liverpool LGA and as a tertiary referral hospital for all of SWSLHD. It also provides critical care for rural retrieval catchments and a supra regional catchment for quaternary services.

The hospital has the highest number of emergency department presentations in NSW, is second only to Westmead in the number of inpatients treated, is one of seven major trauma units in NSW for adults and one of only three adult Brain Injury Rehabilitation Units in Sydney.

FUTURE PLANNING REQUIREMENTS

The infrastructure planning for the Liverpool Health and Academic Precinct (LHAP) was announced by the NSW Government in 2017 under the management of NSW Health Infrastructure with an initial target budget of \$740 million addressing the 2026/27 component of the overall CSP.

Work commenced on the masterplan for Liverpool in early 2018. The Master Plan has been informed by the clinical expansion priorities of the CSP which includes the following scope:

- Comprehensive and integrated cancer centre and centre of excellence including inpatient, ambulatory, haematology, diagnostic, outpatient facilities
- Emergency Department and critical care services including paediatric emergency/ short stay, Intensive Care, Neonatal ICU and Special Care Nursery
- Maternity and paediatric inpatient beds, birthing suite & ambulatory care services
- IR and OT expansion including trauma capacity, increased number of hybrid theatres and associated anaesthetic and perioperative capacity
- Medical and Surgical inpatient capacity
- Aged Care and Rehabilitation expansion
- Ambulatory Care, outpatient clinics and day procedures
- Mental Health including acute aged care psychiatry and sub-acute
- Establish renal transplantation services
- Facilities and capacity for integrated teaching and clinical research in partnership with industry and higher education partners
- Associated clinical and non-clinical support services (including Pathology, Medical Imaging and Pharmacy)
- Multi-storey carpark comprising of circa 1100 car spaces

PROJECT OVERVIEW

The vision for Liverpool Health and Academic Precinct (LHAP) is to create an integrated health and academic precinct that meets the health services needs for Liverpool and beyond.

The LHAP project will establish Liverpool hospital as a leading integrated health facility, creating a foundation for world-class clinical expertise, innovation, research and technological advancements to continually improve the delivery of quality healthcare for greater Sydney.

The multi-storey car park is situated in the north-eastern corner of the hospital campus, adjacent to the rail line and Liverpool Boys & Girls High Schools to the north and provides for increased car parking capacity to service the future service needs of the hospital through to 2026/27.

The project includes improved pedestrian way-finding and amenity to the campus, landscape upgrades and the removal of a derelict building on site.

This SSDA seeks consent for:

- Demolition and site preparation work
- Development of a 7 storey multi-storey car park comprising of approximatly 1250 car parking spaces on the eastern section of the main clinical campus
- Internal road reconfigurations and revised connections to the existing road network
- Covered pedestrian walkway connections to the existing hospital facilities
- Wayfinding and signage
- Associated landscaping

The Main Works for the LHAP project comprise a separate SSDA submission.



Existing context



Proposed built form (excluding Main Works)

DEVELOPMENT OVERVIEW

COMPLIANCE

BCA

The project is classified as follows:

- BCA classification: Class 7a
- Rise in storeys: 7
- Type of construction Type A
- Importance level (structural): 2 (HI PD to confirm)
- Effective height: >12 and <25
- Floor Area Approx: 32,000 m²
- Sprinkler protected throughout: No
- Climate zone: Zone 6

While the building is proposed to generally comply with the deemed to satisfy provisions of the BCA, there are some departures which will either be revisited throughout developed design or be addressed by alternative solutions from the BCA Consultant, Fire Engineer and respective specialist consultants.

Refer to BCA report for further details.

HEIGHT

The new MSCP is 25.0 m high, from RL10.5 (Ground) to RL35.5 (top of the lift overrun). The MSCP includes 7 storeys of split level parking in addition to ground floor undercroft and ongrade parking.

FIRE ENGINEERING

The project includes a number of areas where compliance with the prescriptive fire safety provisions of the BCA cannot be readily achieved.

Proposed departures requiring a performance solution have been reviewed and assessed by a fire engineer and the BCA consultant to ensure these can be readily addressed and it is expected that the development will achieve compliance. The principal areas of departure relate to extended travel distances in certain areas.

A Fire Engineering Brief has been prepared and initial consultation with NSWF&R has been undertaken.

Refer Fire Engineering Report for further details.

DDA

Accessibility has been considered at each stage of the design process undertaken to date. A detailed DDA review of the project is currently being undertaken in conjunction with the DDA consultant and will be further developed and considered in the following project stages.

The accessibility code and standards will be incorporated into detailed design in conjunction with the specific details nominated with the Australian Health Facility Guidelines.

FLOODING

Whilst the site's proximity to the Georges River and its overall low topography make it susceptible to flooding, the western campus is not at risk from a 1-in-100 year flood event.

The Substation and Switchroom for the car park have been located above the Potential Maximum Flood (PMF) at RL10.80, however it is noted that the car park is not deemed to be critical infrastructure in a PMF event so there is no formal requirement to comply with this.

Refer page 2 - 04 for details.

BUSHFIRE

The proposed development does not fall under any Bushfire Protection controls.

TYPICAL FLOOR ARRANGEMENT

The linear split floor plate is stacked vertically with two internal ramps on either ends to allow for efficient circulation and traffic movement between each level, allowing for maximum yield of car spaces per level.

An electronic carpark management system is proposed by the Traffic Consultants to assist users readily locating available parking within the multistorey car park.

FLOOR TO FLOOR HEIGHTS

The car park overhangs into the road carriageway along the northern edge. To allow emergency and service vehicles to be accessible along 'New Hospital Road' the minimum clearance to underside of Level 1 structure is 4.5m clear head height is maintained and the typical levels between level 1 and 7 has been designed at 2.8m floor to floor height.

Structural beam depths are typically 400mm in depth. This gives a clearance of 2.4m to underside of structure.

AS1428.1-2009 and AS2890.1-2004 both require a minimum of 2.2m clear throughout the car park generally. This allows 200mm clear for services under areas with maximum beam depth. Services include falls to required drainage on level 5 - roof deck car parking.

COLUMN GRID

The column grid for the car park has been designed to a typical $10.8 \,\mathrm{m}\,\mathrm{x}$ 8.4m layout. This is an efficient grid arrangement for the linear floor plate of the car park (allowing 4 car spaces between columns).

This is based on a typical 2.6m wide by 5.4m parking bay in accordance with HI Car Park Design Guidelines. Small car bays are proposed where adjacent walls, etc impact on clearances required by A\$2890.1

LATERAL SYSTEM

The stair and lift cores for the car park provides lateral capacity (bending and torsion) to the car park levels above ground. To account for the loss of lateral capacity due to the linear floor plate, shear walls are provided to strengthen the lateral structure throughout the car parking levels.



Proposed built form (excluding Main Works)



CGI Image

AREA SCHEDULE

GBA (1)	Existing P2 (demolished area)	Existing P2 (demolished spaces)	New MSCP (floor area m²)	New MSCP (spaces)	Spaces per m²	PROPOSED NEW GFA (floor area m²)
Ground Level (on-grade)	2,050	64 (6 acc)	2,021	66 (11 acc)	31	20
Ground Level (undercroft)	3,550	126 (6 acc)	3,183	94 (12 acc)	34	0
Level 01 (a+b)	3,550	138	4,219	144	29	0
Level 02 (a+b)	3,550	138	4,748	152	31	0
Level 03 (a+b)	3,550	124	4,343	159	27	0
Level 04 (a+b)			4,343	158	27	0
Level 05 (a+b)			4,343	159	27	0
Level 06 (a+b)			4,343	158	27	0
Level 07 (a+b)			4,343	158	27	0
Total	16,250	590	35,886	1,248	29	20

Notes: 1) Existing P2 GBA is an estimate only based on a measure of available data including design, surveys and aerial photography

Total Existing GFA	117,045 m2	Includes all existing buildings on the eastern and western campus, excluding major plant and car parking
Existing FSR	0.75:1	Note this is an estimate only to provide an indication of overall site density and comparison to LEP controls
Total Proposed GFA	117,065 m ²	Includes all existing buildings/Excludes all buildings to be demolished
Proposed FSR	0.75:1	Note this is an estimate only to provide an indication of overall site density and comparision to LEP controls

Notes: 1) Existing building GBA is an estimate only based on a measure of available data including design and as-built drawings, surveys and aerial photography

2) Existing building GFA has been conservatively estimated at 90% of measured GBA

DESIGN PRINCIPLES

The following Design principles have been developed by the Project Design Team, NSW Health Infrastructure, the SWSLHD and Executive Hospital Staff to outline the objectives and vision for the LHAP Project.



Patient focussed

Enhance the amenity, treatment and overall experience for patients and visitors



Centre of innovation

Establish a centre of innovation for treatment, translational research, health technology & cancer



Beyond 2026

Outline a strategy for the long term expansion of the hospital beyond 2026



Campus-wide integration

Facilitate collaboration, knowledge & resource sharing and a seamless transition of health services



An anchor for the LIP

Lay the foundation for the Liverpool Innovation Precinct to build upon



Integrate education & research

Enable innovation and collaboration across precinct partners & the community



Open

Dissolve the boundaries of the hospital to enable integration with precinct partners, the CBD & the community



Minimise disruption

Minimise where possible staging & decanting during construction to avoid disruption to existing services & minimise cost



Improve circulation & wayfinding

Reduce congestion, improve campus connectivity & wayfinding for vehicles & pedestrians



Utilise existing assets

Utilise hospital owned assets and available land where possible



Core clinical relationships

Improve connectivity to core clinical services



Value for investment

Maximise return on investment through efficiency in design and clear prioritisation of project objectives

KEY SITES

- 01. westfield liverpool
- 02. liverpool public high schools
- 03. tafe liverpool
- 04. all saints catholic collage
- 05. liverpool public school
- 06. liverpool bus depot
- 07. university of western sydney
- 08. sydney southwest private hospital





THE SITE 2-01

CONTEXT

EXISTING HOSPITAL CAMPUS

The majority of buildings on the hospital campus date from 1975 (Don Everett Building) to the mid 1990's and comprise mostly 2-3 storey buildings of concrete construction with brick facades and punched windows. These include the original Clinical Services Building (CSB) and the Caroline Chisholm building, into which the proposed new ISB connects. The 2015 CSB extension is the newest development on the site and has addressed some of the needs for clinical expansion.

The Health Services Building and Ingham Institute are located on the northern campus across Campbell Street with a new bridge link proposed to connect the Ingham Institute to the new ISB.

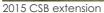
LIVERPOOL HIGH SCHOOLS

There are a variety of structures on the High Schools site with the majority ranging from one to two storeys of predominantly brick and reinforced concrete structures.

There are a few newer buildings on the site, most likely constructed throughout the early 2000's with the larger of these buildings constructed as part of the Federal Governments BER program.

There are various demontable buildings located on the southern fenceline adjacent to the Hospital.







Original CSB



Caroline Chisholm







Liverpool Girls' Block M



Southern Demountable Structure

PRECINCT SITE ANALYSIS



ZONING

Liverpool Hospital is encompassed within the Liverpool City LGA.

The site is zoned SP2 Health Services Facility and Educational Establishment, with permissible uses being Health Services Facility and Educational Establishment including any development that is ordinarily incidental or ancillary to development for that purpose.



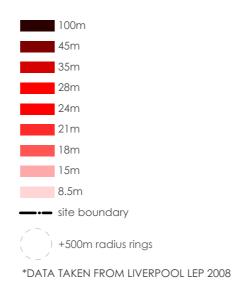
*DATA TAKEN FROM LIVERPOOL LEP 2008



HEIGHT

Under the Liverpool Development Control Plan 2008 both the western and eastern campuses of the Liverpool Hospital have a height limit of 35 metres.

The existing helipad on the roof of the new Clinical Services Building sits just below this height limit and acts as a datum across a large part of the site within which any new buildings must sit below to preserve safe flight paths for helicopters.





HERITAGE

The Liverpool Hospital site is not identified as an item of heritage significance though it is partially located within the Bigge Park Conservation Area. The eastern campus zone of the Hospital is not affected by heritage issues.

The site is located close to a number of local heritage items in the area, including:

- The local street network identified as 'Plan of Town of Liverpool (early town centre street layout-Hoddle 1827)
- L iverpool College (TAFE) site, including Blocks A-G, chimneystack, fences, gatehouses and archaeological features (formerly Liverpool Hospital and Benevolent Asylum)
- Bigge Park

In addition to these items, the site contains areas of landscaping that are of community interest and potential heritage significance. This includes elements of the entry forecourt including seating structures, planters and a number of established palm trees. It also includes a row of palm trees along Elizabeth Street on the eastern campus.



*DATA TAKEN FROM LIVERPOOL LEP 2008

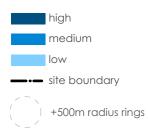
PRECINCT SITE ANALYSIS



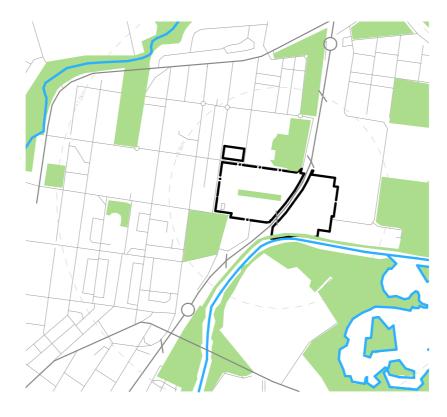
FLOODING

The overall site area has site levels varying from approximately RL8.5 (AHD) to parts of the eastern campus through to approximately RL12 in areas of the western campus. The site's proximity to the Georges River and its overall low topography makes it susceptible to flooding with the probable maximum flood level being RL10.9 (AHD) with the 1 in 100 year flood level being RL8.8.

The western campus is not at risk from the 1 in 100 year flood level. The site is also subject to localised overland flooding from surrounding streets (refer to the Civil Engineering section within this report).



*DATA TAKEN FROM LIVERPOOL LEP 2008



GREEN SPACES

There have been numerous evidence based studies linking the natural environment contribution to prevention through increasing physical and mental wellbeing and providing patients therapeutic benefits for recovery from illness. Incorporating gardens and open spaces into hospitals can enhance the healing process and provide a place where people can be relieved of some of the stress that can come with hospital experiences.

Liverpool Hospital is advantaged in that there is a degree of usable open space within the campus in the form of a central courtyard bound by the Clinical Services Building and Caroline Chisholm and numerous smaller green areas surrounding the site's built infrastructure.

In addition the precinct surrounding the Hospital has a number of open spaces in the form of Bigge Park to the south of the Hospital and the playing filed of Liverpool Girls High School. The future development of the Georges River precinct will include various public open spaces overlooking the river.





LAND OWNERSHIP

The following sites form the cluster of facilities within and around the Liverpool Hospital and are under the ownership of the Health Administration Corporation:

- The western and eastern hospital campuses
- The Health Services Building and Ingham Institute on Campbell Street
- Liverpool Ambulance Station at 45 Forbes Street
- Liverpool Specialist Medical Centre 45-47 Goulburn Street
- Liverpool Living Skills Activity Centre 19 Flowerdale Road
- Liverpool Karitane Family Day Care Centre 10 Murphy Ave
- Mental Health Group Home 16 Carboni Street

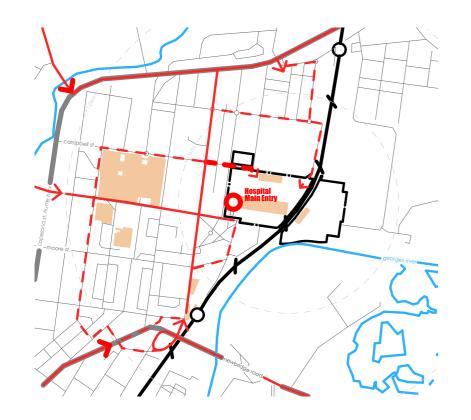
The following site is under the ownership of SWS Area Health Service:

- Bigge Park Centre 13 Elizabeth Street
- department of education tafe
- private education
- private holding

 city of liverpool council
- railcorp
 private hospital
- health administration corporation
- --- site boundary

*DATA TAKEN FROM LIVERPOOL HOSPITAL & AUXILLARY SITES

PRECINCT SITE ANALYSIS

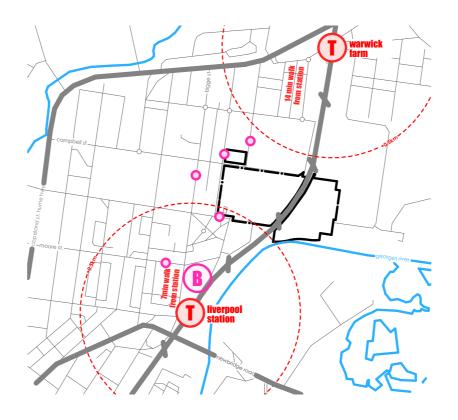


VEHICULAR APPROACH PATHS

secondary & ring roads
main vehicular approach
car parking

--- site boundary

+500m radius rings



PUBLIC TRANSPORTATION

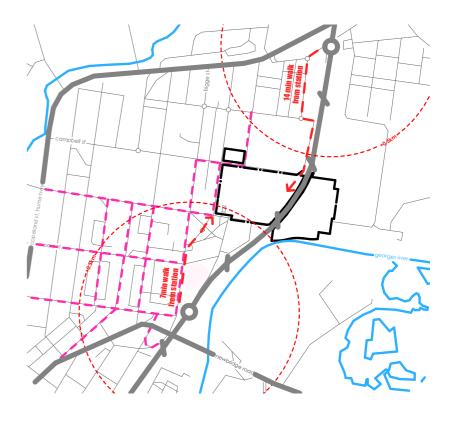
bus stops adjacent to hospital

B bus interchange

train station

--- site boundary

+500m radius rings



PEDESTRIAN MOVEMENT

pedestrian routes from key transport hub

-- DCP: high pedestrian priority routes

--- site boundary

+500m radius rings

 \bigcirc

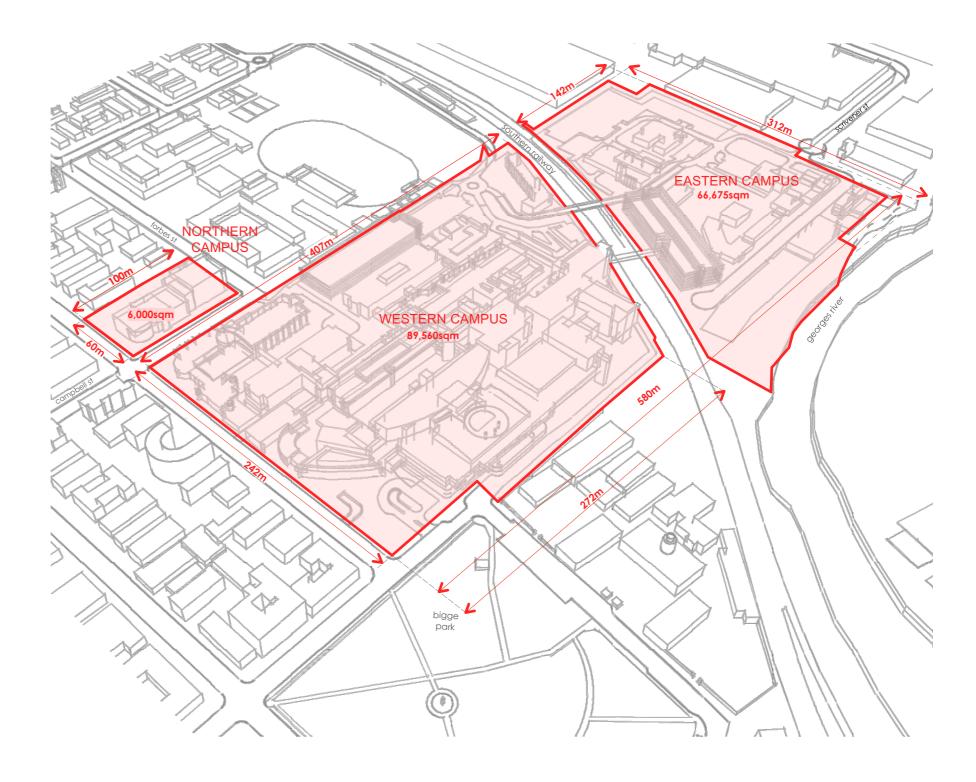
SITE ANALYSIS

SITE DIMENSIONS

The total approximate hospital campus area including both the eastern and western campuses is:

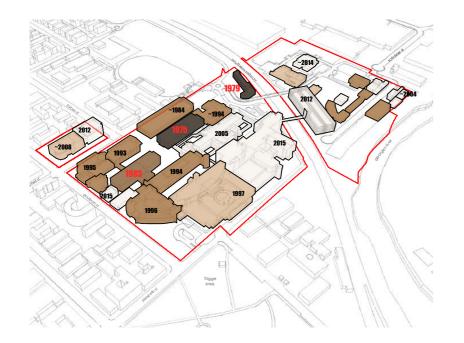
156,235 m² (15.6 ha)

Note the northern campus has been excluded from the overall site area for the purposes of FSR calculations as this site, whilst owned by the SWSLHD, is subject to separate land titles, lease agreements and planning controls.

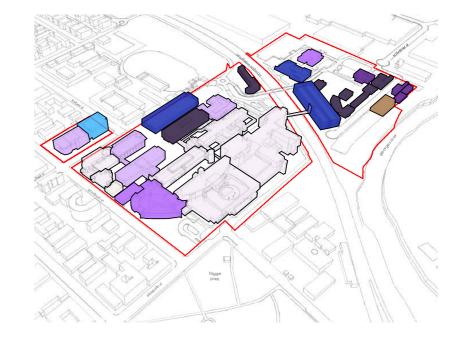


THE SITE 2-06

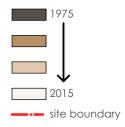
SITE ANALYSIS







AGE OF BUILDINGS



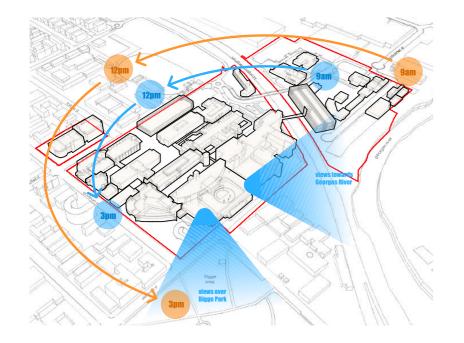
HEIGHT OF BUILDINGS

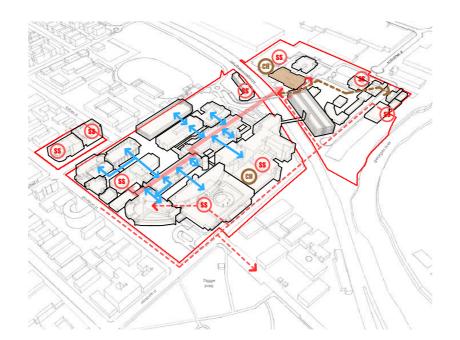


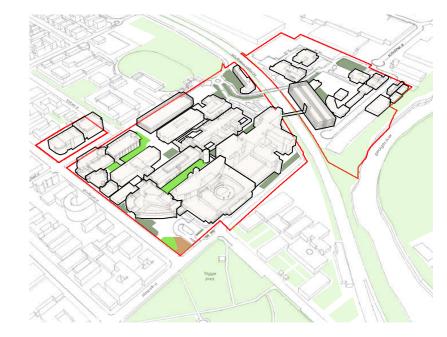
USE OF BUILDINGS



SITE ANALYSIS







SUN & VIEWS



--- site boundary

EXISTING INFRASTRUCTURE

comms line

- -- endeavour energy hv

major underground service tunnel containing

- hot water pipes
- chilled water pipeshospital hv electrical cables
- gas pipes
- comms lines

chilled water system

(SS substation

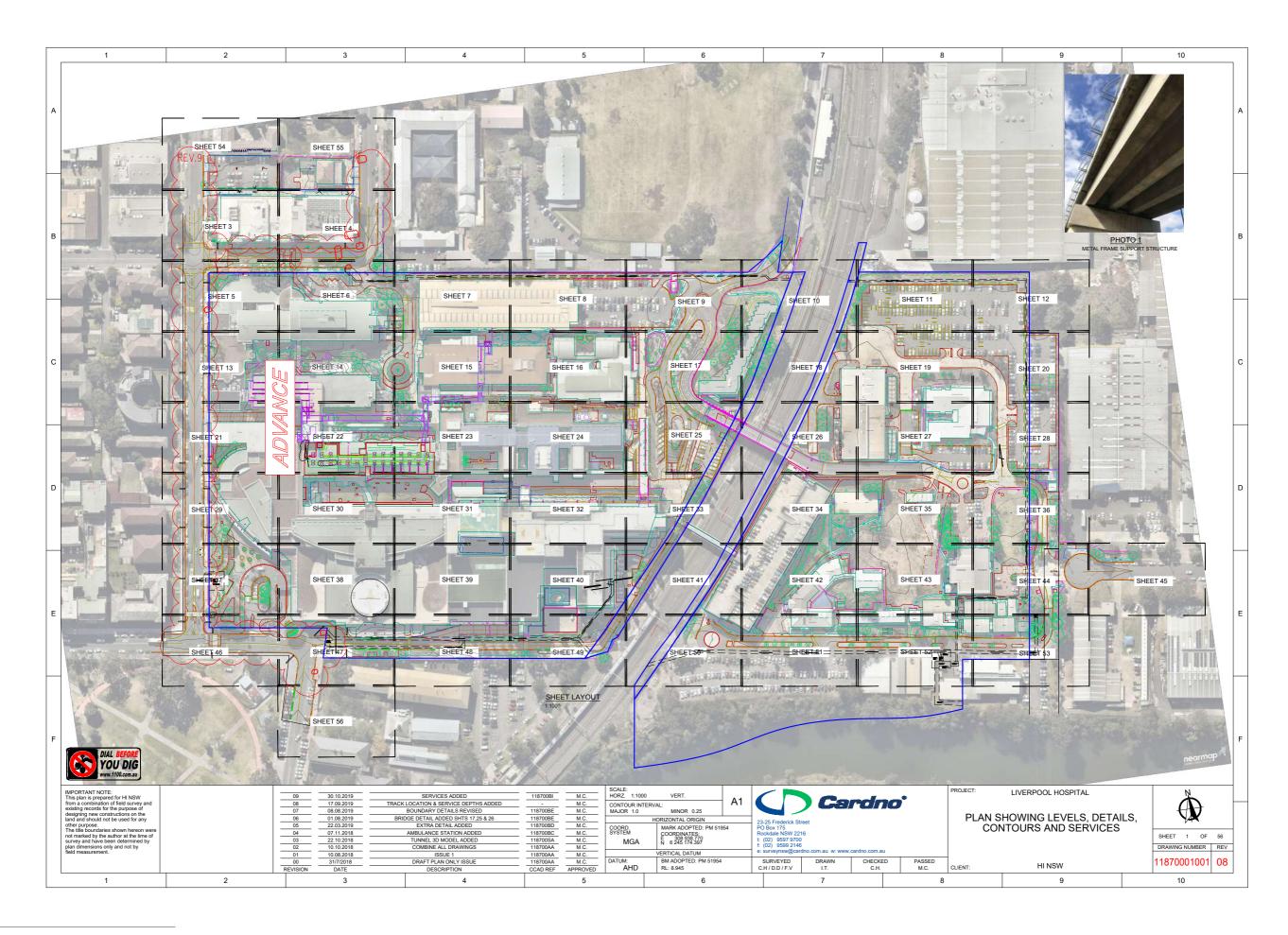
- central energy building
 6 x cooled chillers
- 6 x cooling towers 6 x off gas boilers
- 3 x off compessors
- water pumps & water distribution systems

--- site boundary

GREEN SPACES





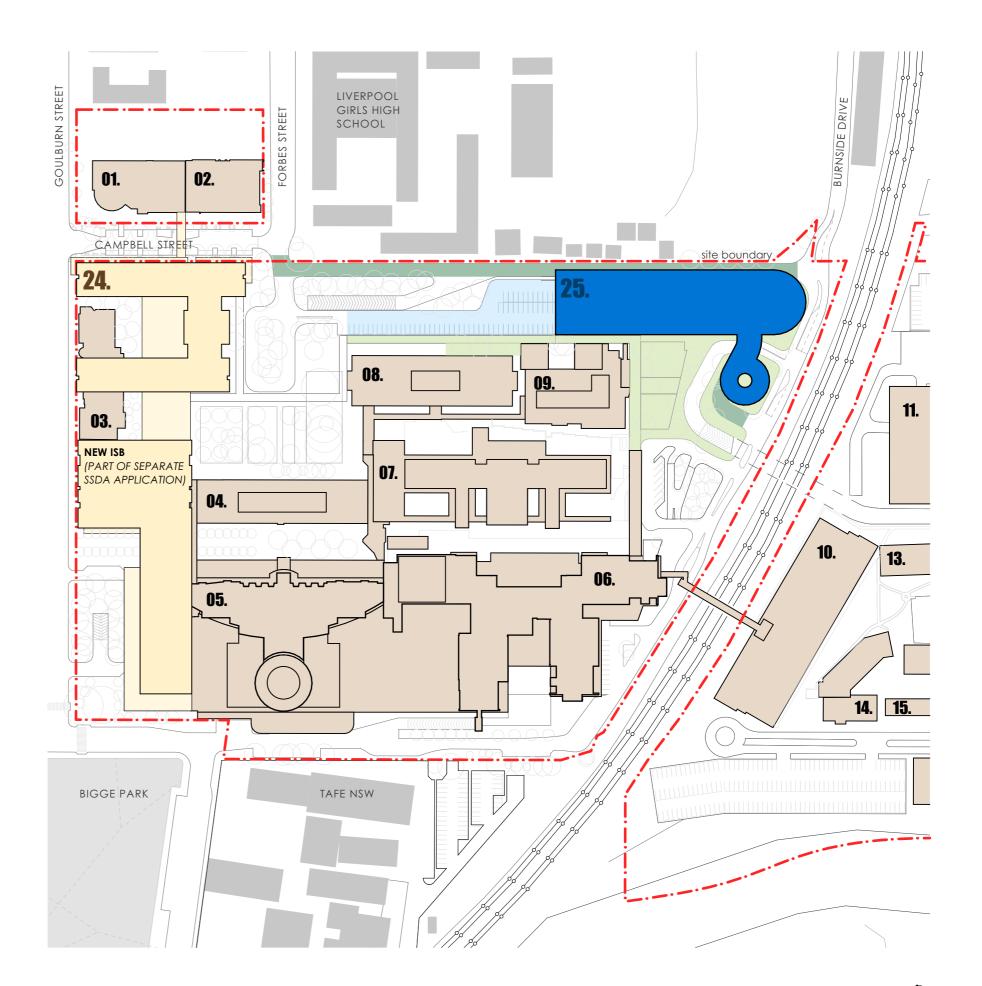


SITE PLAN

LEGEND

- 01. health services building
- 02. ingham building
- 03. oncology bunkers
- **04.** caroline chisholm
- 05. old clinical services building
- **06.** new clinical services bld
- 07. mental health centre
- 08. don everett building
- 09. brain injury unit
- 10. P4 multi-storey car park
- 11. central energy building
- 12. ngara health education
- 13. bungala building
- 14. child care centre
- 15. staff education trainning
- **24.** new integrated services building (ISB) (seperate SSDA)
- **25.** new multi storey car park



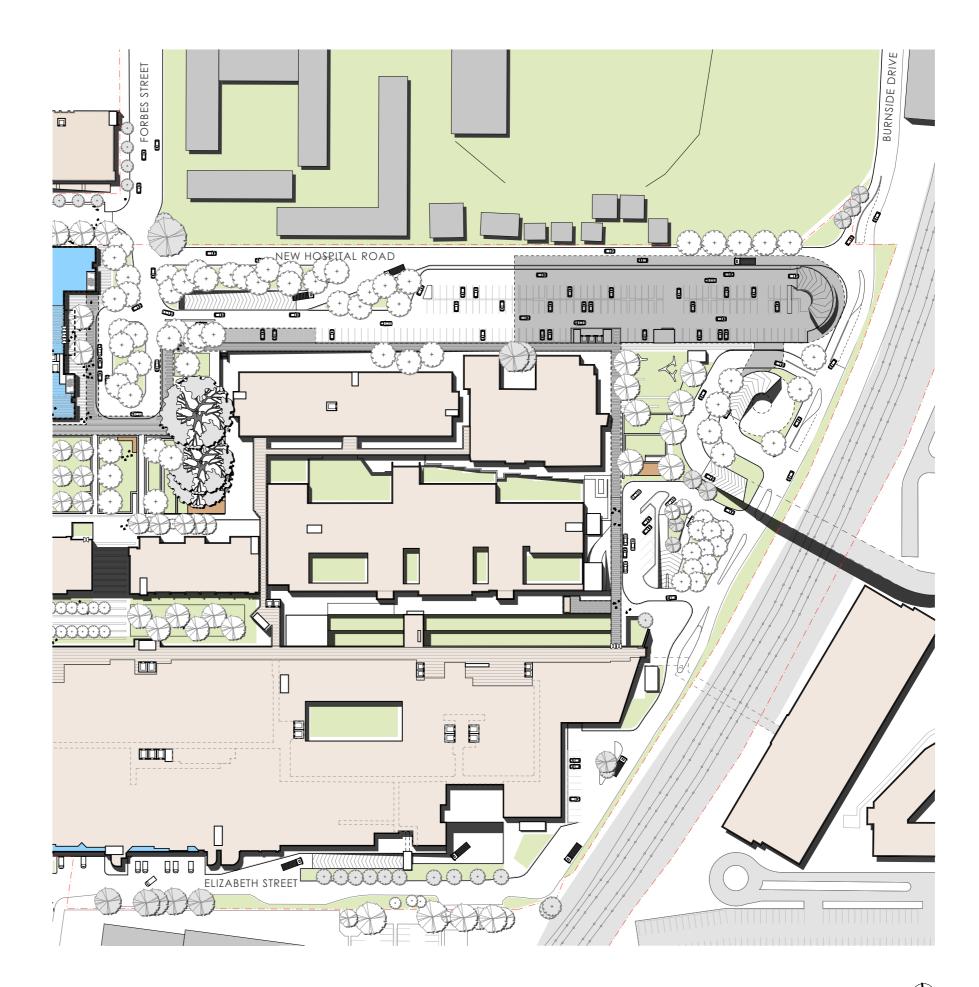


THE SITE 2 - 10

GROUND PLANE

The new MSCP is situated in the north-eastern corner of the Liverpool Hospital campus and provides improved pedestrian way-finding and amenity, open space, landscape upgrades and the removal of outdated buildings on site.

The combination of the overall LHAP project with the broader vision for the LIP will deliver an integrated Health, Academic and Research precinct that will provide significant public benefit in terms of placemaking, access & amenity, economic growth, learning and teaching opportunities as well as access to world-leading health care.



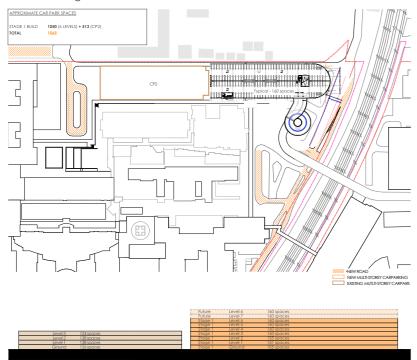
THE SITE 2-11

OPTIONS ASSESSMENT

The following alternate car parking options were explored in detail through the design process. Other options were considered at a higher level, but discarded due to fundamental issues including budget, timing, restrictions around funding models and planning outcomes.

OPTION 1

Retain existing P2 Car Park and connect to a smaller new MSCP



PROS

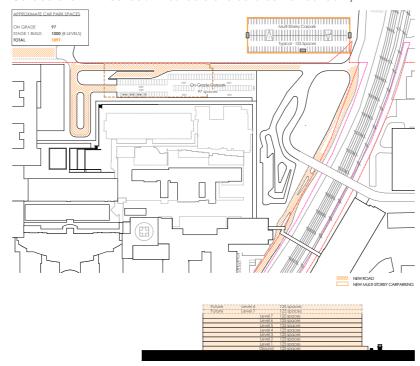
- Utilises existing building infrastructure
- Reduced scope of new build may reduce project cost

CONS

- Existing P2 Car Park does not meet current Australian Standards or Health Facility Guidelines (eg, no lifts or provision for equitable access)
- Inherent deficiencies with regards to building compliance will require expensive upgrades and on-going maintenance and management
- Retaining P2 prohibits access to proposed Main Works loading dock
- Retaining P2 Car Park prohibits future hospital master planning beyond 2026/27 and land-locks Don Everett Building (out-dated building stock)
- Connectivity between existing and proposed car parks will be difficult due to the requirement for the new Car Park to meet current design standards which will result in a different layout and floor-to-floor heights

OPTION 2

Collaboration with Schools Infrastructure to build combined facility



PROS

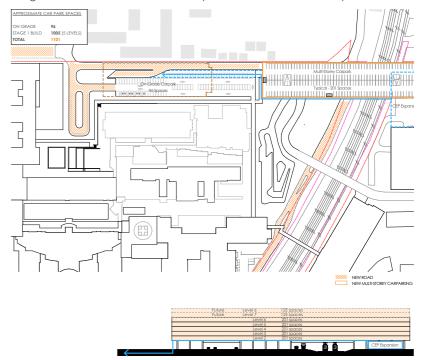
- Combines Health Infrastructure and Schools Infrastructure needs into a consolidated facility
- Frees land on the hospital campus for future expansion
- Minimal impact on hospital operations during construction

CONS

- Land aquisition and/or agreement with Schools Infrastructure required represents project risk due to timing and need for planning certainty
- Increased distance of new Car Park from Hospital facilities creates difficulties in terms of access for patients, staff and visitors and may require a shuttle service or other mobility assisting measures
- Saftey risks associated with hospital users required to cross roads
- Does not address inherent issues with current hospital access in the northeast corner of the hospital site (ie the five-way round about)
- Poor provision of building services in this location will require costly infrastructure works

OPTION 3

Bridge over the Rail Line and utilise a portion of the Eastern Campus



PROS

- Utilises available area on the Eastern Campus
- Allows for a new crossing for services over the Rail Line, facilitating potential future expansion of the Central Energy Plant
- Proximity to existing services infrastructure (eg, Eastern Campus)

CONS

- Approval and/or agreement with RailCorp to utilise air space represents project risk due to timing and need for planning certainty
- Significant project costs associated with the structure required to bridge the Rail Line
- Difficult and/or complicated vehicular access from Burnisde Drive into the new Car Park
- Staging of works would be difficult above existing roads
- Increased distance of new Car Park from Hospital facilities creates difficulties in terms of access for patients, staff and visitors and may require a shuttle service or other mobility assisting measures

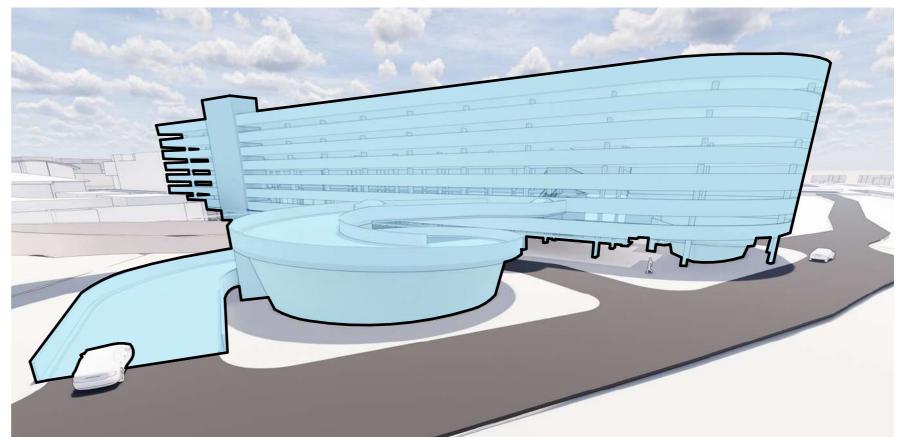
MASSING & BUILT FORM

The car park presents as a single, linear form running along the northern site boundary. The curved eastern end softens the visual bulk when viewed on approach from Burnside Drive whilst also mediating the intersection by suggesting access to either side of the car park.

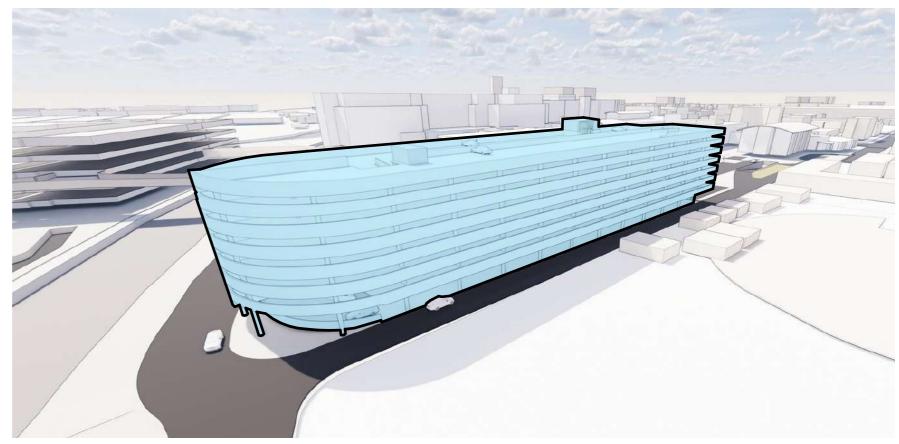
The ground level is set back from the New Hospital Road to the north, allowing 4.5m height clearance for service and emergency vehicles. This setback helps to reduce the visual height of the northern elevation, a visual effect that is further enhanced with an alternate facade treatment that includes planting and climbers growing along the ground level facade.

On the southern side, a circular ramp provides vehicular access allowing entry and exit from Level 2. This structure is expressed as a stand-alone element, distinct form the primary car park form.

In the context of the existing hospital campus and the existing schools site, including extensive open area and large distances to the majority of existing school buildings, the proposed massing is considered acceptable and appropriate to facilitate the required parking demand for the hospital.



View looking north



View looking south





1. Stainless Steel Anti Climb Mesh



- . Aluminium Panels Fixed to Tensile Wire Mesh
- 600 MM H Color 'A': Green
- 300 MM H Color 'B': Brown
- 150 MM H Color 'C': Dark Green



3. Stainless Steel Hi-Tensile Wire Mesh



- **4.** Crash Barrier
- Type 1- Standard Barrier Type 2- Heavy Duty Barrier



5. Concrete ramps and building structure







ENVELOPE & FACADE

FINISHES

Finishes have been selected to compliment the overall design intent, accentuating key design features and maintaining a consistent aesthetic throughout the precinct.

Key considerations in the selection and specification of finishes include:

- Ventilation requirements for open deck car park design
- Durability / longevity / warranty period
- Safety / slip resistance
- Ease of ongoing maintenance and / or replacement
- Environmental sustainability
- General Health & well-being

All finishes and products selected are of commercial grade quality and meet Health Infrastructure's Hospital Car Park Design Guidelines (May 2019 v12).

Typical Level Typical Level

TYPICAL ELEVATION



LEGEND

- 1. Stainless Steel Anti Climb Mesh
- 2. Aluminium Panels Fixed to Tensile Wire Mesh
- 600 MM H Color 'A': Green
- 300 MM H Color 'B': Brown
- 150 MM H Color 'C': Dark Green
- 3. Stainless Steel Hi-Tensile Wire Mesh
- 4. Crash Barrier
- Type 1: Standard Barrier
- Type 2: Heavy Duty Barrier
- 5. Concrete ramps and building structure
- 6. Planter with vertical climbing plants



VEHICULAR CIRCULATION

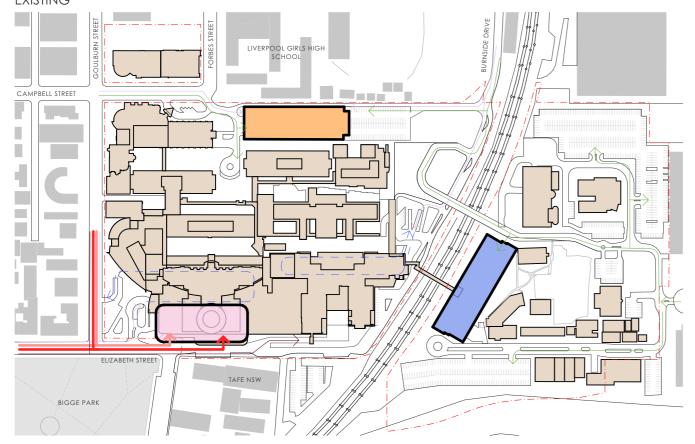
The LHAP project seeks to reduce vehicular congestion at critical areas around the hospital, in particular at the intersection of Goulburn and Elizabeth Streets and around the new expanded Emergency Department.

- 1. ED traffic congestion; public, ED and loading dock all use same vehicular separation
- 2. Limited public ED parking
- 3. Disjointed basement parking
- 4. Complicated public drop off / parking
- 5. Inefficient multistory car parking facility

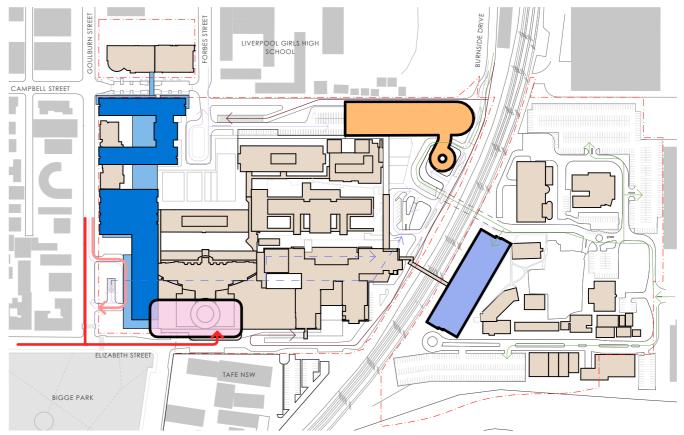
- ED traffic congestion alleviated; new ED entrance with separated ambulance and public access. Loading dock access re-routed and separated from ED access
- 2. Public ED parking increased
- 3. Basement parking connected
- 4. New public hospital drop off and simplified / efficient car parking facilities off Campbell Street



EXISTING



PROPOSED FINAL MASTERPLAN



WAY-FINDING & ENTRY POINTS

The ground plane has been designed to provide clear way-finding both within and outside of the hospital campus, including:

- A new major internal hospital street (north-south) intersecting the existing primary east-west street
- Introduction of a shared zone to Campbell Street to provide seamless connection to the sites to the north including the Ingham Institute and the potential future growth of the Innovation Precinct (LIP)
- A new bridge connection over Campbell St to the Ingham Institute
- Improved vehicular connectivity around the campus
- Improved pedestrian circulation throughout the campus including covered access to new and existing parking facilities
- A major repositioning of the campus to improve permeability, access and to allow connectivity to future health-related development on adjacent sites
- Main public non critical drop-off located at rear of hospital site; remotely located from majority of services
- 2. Unassuming entry from Elizabeth Street
- 3. Unclear hospital entry from Campbell Street

- 1. Public entry points focused around new integrated services building
- 2. Loading entry re-orientated to suit new road network
- 3. Secondary loading entry pointed added to service new integrated service building

site boundary







public parking entry

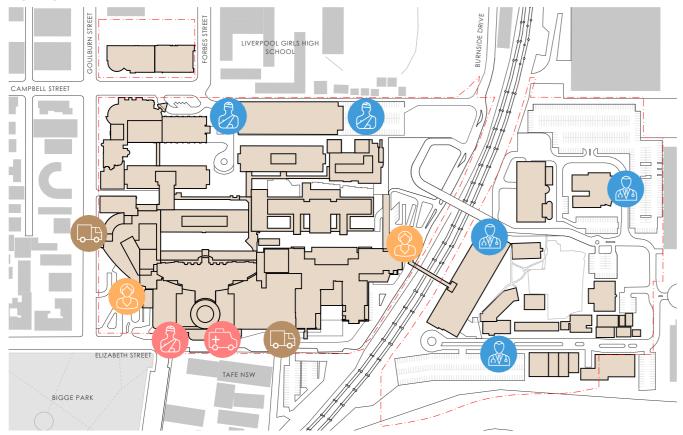
staff parking entry

heavy vehicle loading

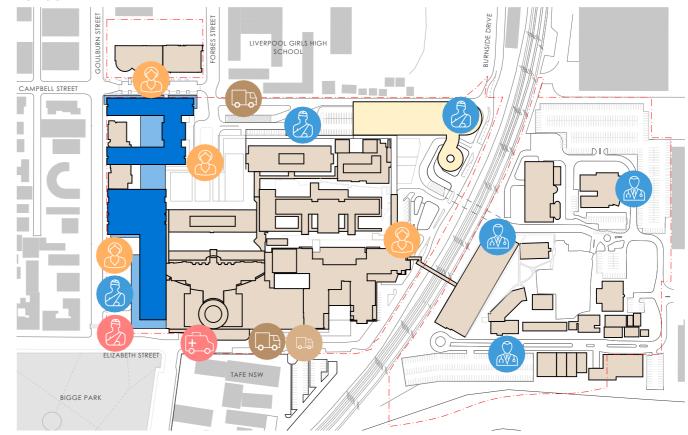
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EXISTING



PROPOSED



PEDESTRIAN CIRCULATION

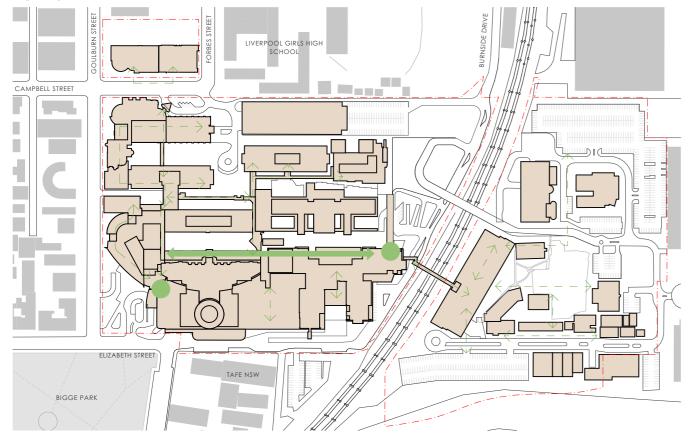
The LHAP project seeks to improve predestrian circulation around the hospital campus with the establishment of a new major internal pedestrian street and an improved hierarchy of entry points and circulation routes through the hospital.

1. Disjointed and confusing pedestrian access around hospital site

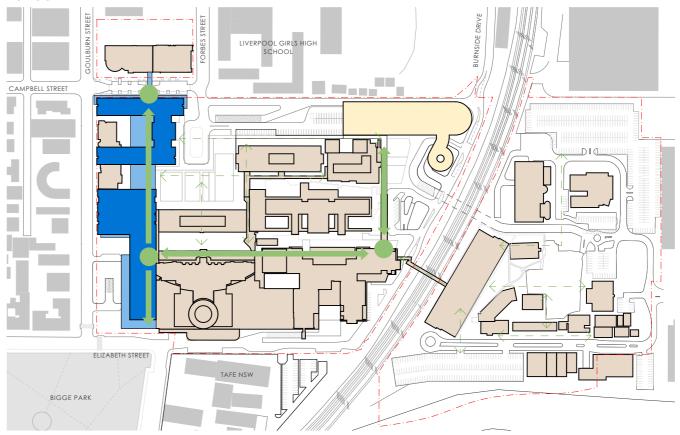
- Major pedestrian "street" created within new integrated services building, connecting to major hospital entry points, education hub and Clinical Services Building, resulting in a clear and cohesive way finding solution
- 2. Simplified pedestrian flows established through the rest of the hospital site that have orientation viewpoints out into the landscape
- 3. Provide visual links between major destinations where possible.
- 4. Provide a series of place making nodes, courtyards and identifiable landmarks to improve wayfinding and orientation.



EXISTING



PROPOSED



BICYCLE ROUTES & PUBLIC TRANSPORT

The LHAP project seeks to lay the foundation for improved connectivity between the hospital campus and the surrounding public transport nodes, in particular Liverpool and Warwick Farm train stations.

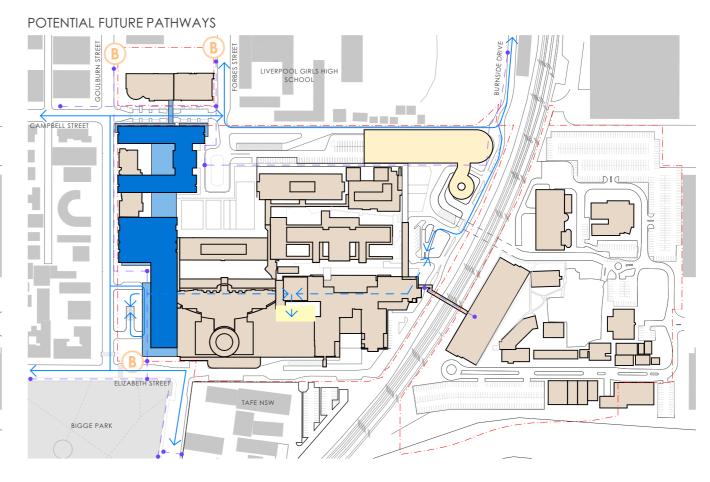
This has been addressed through the layout of the overall Master Plan as well as improvements to the scale, legibility and quality of the main entry on Goulburn Street as well as the rear entry off Burnside Drive.

We understand council is in the process of developing plans for public domain and streetscape upgrades including bicycle routes. Consoltation with Council is ongoing to ensure the LHAP project aligns with these plans and aspirations.

The diagram below outlines the likely future routes for pedestrians and bicycle riders through the Liverpool Innovation Precinct.

site boundary
precinct pedestrian movement
end of trip facility (basement)
bicycle route
bicycle route (basement)
existing bus stop

EXISTING B B LIVERPOOL CIRES HICH SCHOOL SIGGE PARK SIGGE PARK



SERVICING, WASTE & LOADING

SERVICING & LOADING

The LHAP project proposes a revised servicing strategy for the campus to reduce vehicular congestion at critical points and deal with the current and future growth of the hospital.

The primary objective is to remove the majority of service vehicles approaching the campus through the town centre from the south-west via Goulburn and Elizabeth Streets. This will reduce congestion at the primary entry to both the general hospital and the emergency department and potentially take service vehicle traffic out of the Town Centre generally.

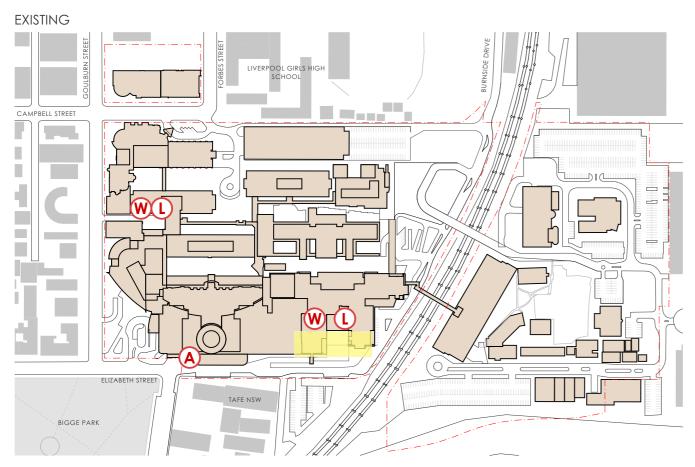
Crucially, this wil also free up the expanded ambulance parking bays along Elizabeth Street, giving priority to emergency vehicles to service what will be one of the largest and busiest emergency departments in the state.

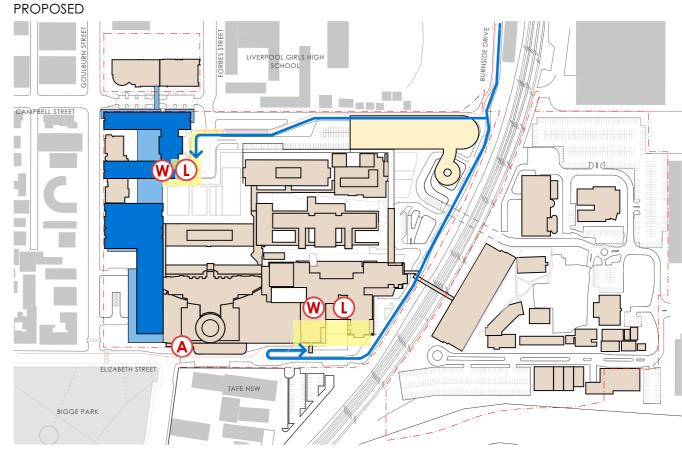
The proposed arrangement directs waste, small and medium rigid service vehicles via Burnside Drive from which they can continue around the rear of the hospital to the existing loading dock, or travel via the new hospital road to the new ISB loading and waste facility. The first level of the carpark cantilevers over the road leaving a suitable 4.5m clearence

This strategy also supports the future growth of the hospital campus beyond the scope of this project.

— site boundary heavy rigid vehicles only small and medium ridget vehicles loading dock (basement) A ambulance bay loading dock W waste and line holding

(basement)





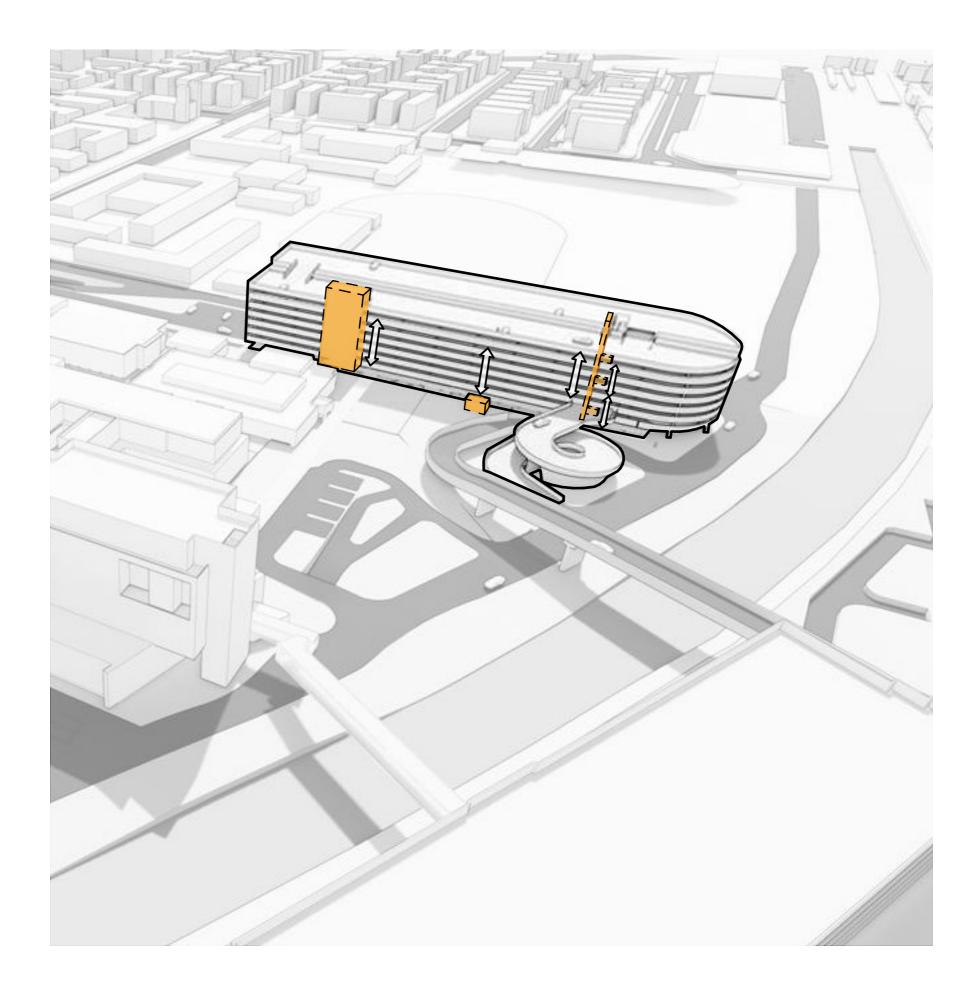
BUILDING PLANT STRATEGY

The new MSCP is an open-deck, naturally ventilated car park that eliminates the need for any active mechanical systems.

The car park is serviced by a centrally located lift bank. A covered pedestrian walkway provides access from these lifts to the existing Clinical Services Building and the proposed new Integrated Services Building (separate SSDA submission).

A kiosk substation and switch room on Ground Level service the electric demand of the car park. The car park also includes security and communications infrastructure distributed through vertical risers attached to the lift core and fire stairs.

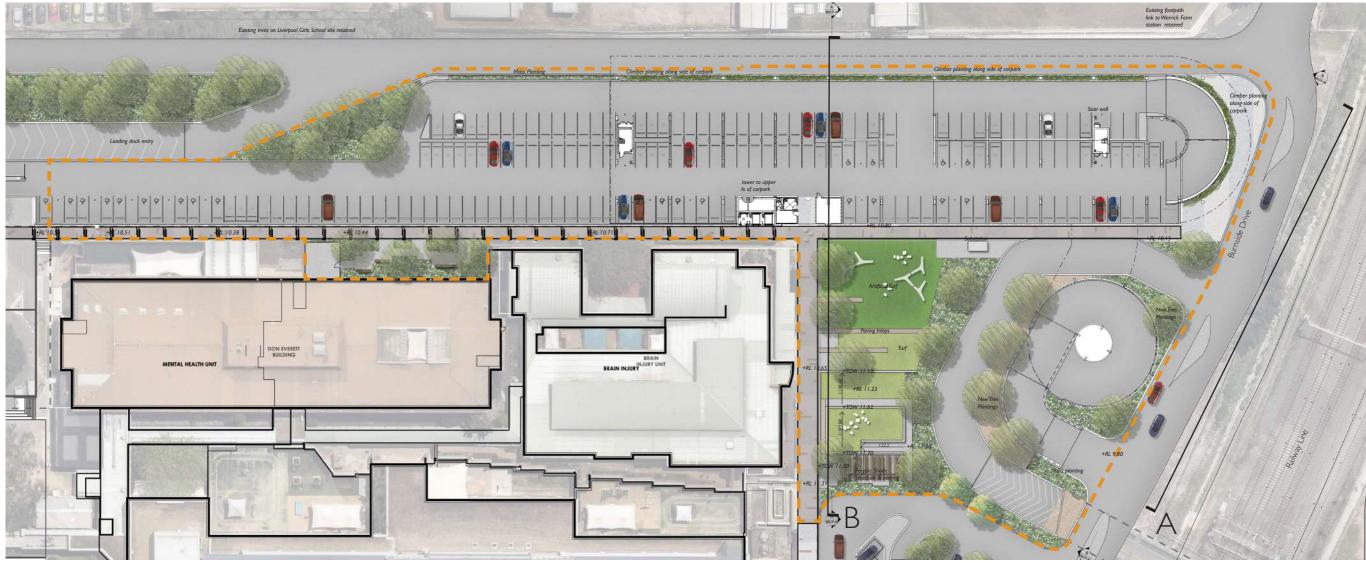
Essential services such as Fire Hydrants and Fire Hose Reels are provided throughout in accordance with BCA requirements.





Plant and Engineering

LANDSCAPE STRATEGY



Extract of the Landscape Plan prepared by CLOUSTON Associates

There is a significant body of evidence showing the value of green spaces and landscaping in the health, wellbeing and recovery time of patients, carers and hospital staff.

The primary landscaping considerations are:

- Patient focussed, stress free and enjoyable
- Circulation and way-finding through the landscape
- The micro-climate and amount of sun and shade
- The function, purpose and use of open spaces
- User amenity
- Maintenance and durability

The Multistorey Carpark (MSCP) and associated works establishes an important opportunity to integrate a new courtyard space within the Liverpool Hospital campus. The terraced courtyard creates an attractive entry to the hospital and helps to soften the built form of the MSCP.

For more information refer to the detailed Landscape Report prepared by CLOUSTON Associates included within the SSDA.



SIGNAGE STRATEGY

WAY-FINDING SIGNAGE

Statutory signage will be provided throughout the precinct as required by NCC 2019, any applicable Australian Standards as well as any other relevant codes or regulations.

Way-finding signage will be included throughout to assist pedestrians, vehicles and the general public to manoeuvre around the precinct in a safe and efficient manner. This will include major signage locations at vehicle entry & exit points from Goulburn Street, Campbell/ Forbes Street and Burnside Drive, as well as directory board signage at each entry lobbies and general way-finding signage at all critical junctions and intersections.

Car park signage will be included to assist with navigation within the car park, as well as to-and-from key arrival points and destinations.

We note that a precinct-wide approach to way-finding signage is necessary to ensure the proper operation of the hospital and the seamless integration of the Education Research Hub with the Main Hospital and any other health-related infrastructure. As such, finalisation of the way-finding strategy, graphic design and typeface will be subject to further review with the LHD Main Works Project Team, NSW Health Infrastructure and key stakeholders.

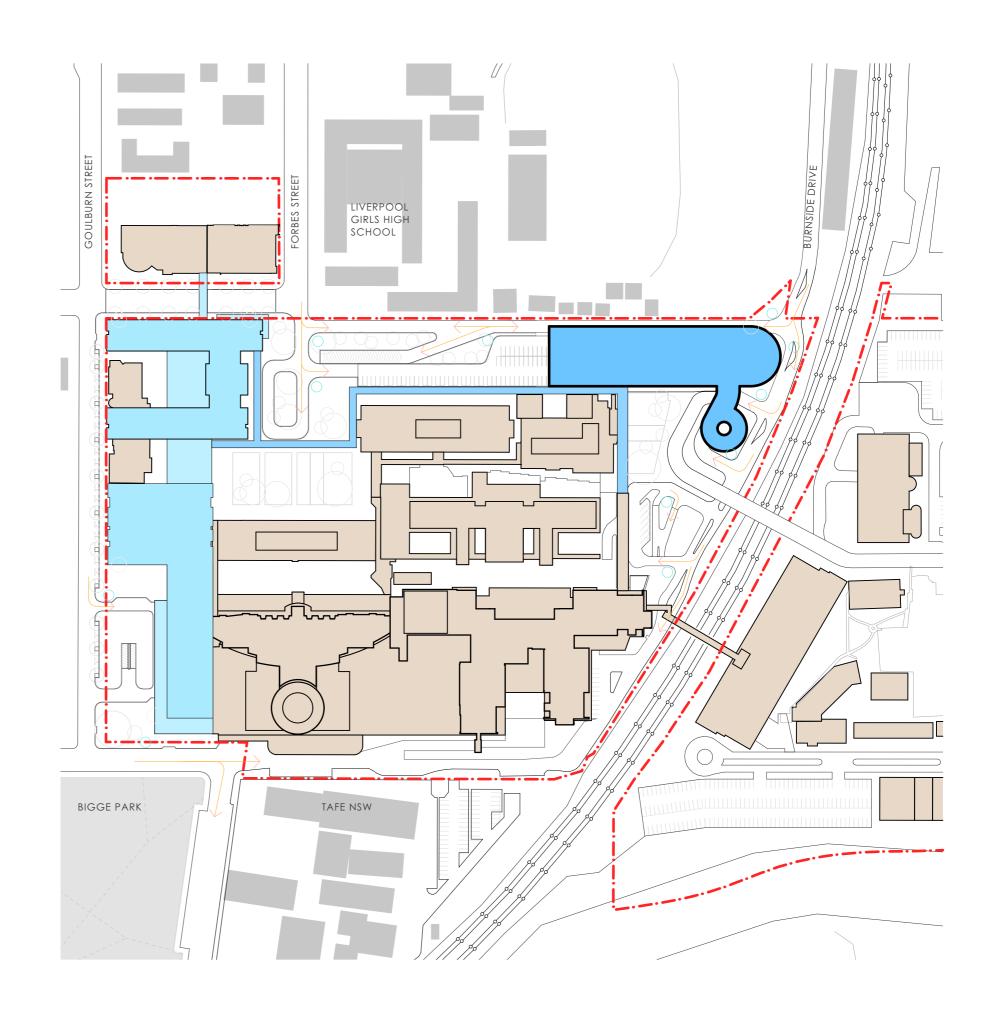
Key way-finding signage locations have been shown on the plan adjacent.

BUILDING SIGNAGE

The hospital will incorporate building signage for information purposes.

Key building signage locations have been shown on the plan adjacent.





FUTURE EXPANSION & FLEXIBILITY

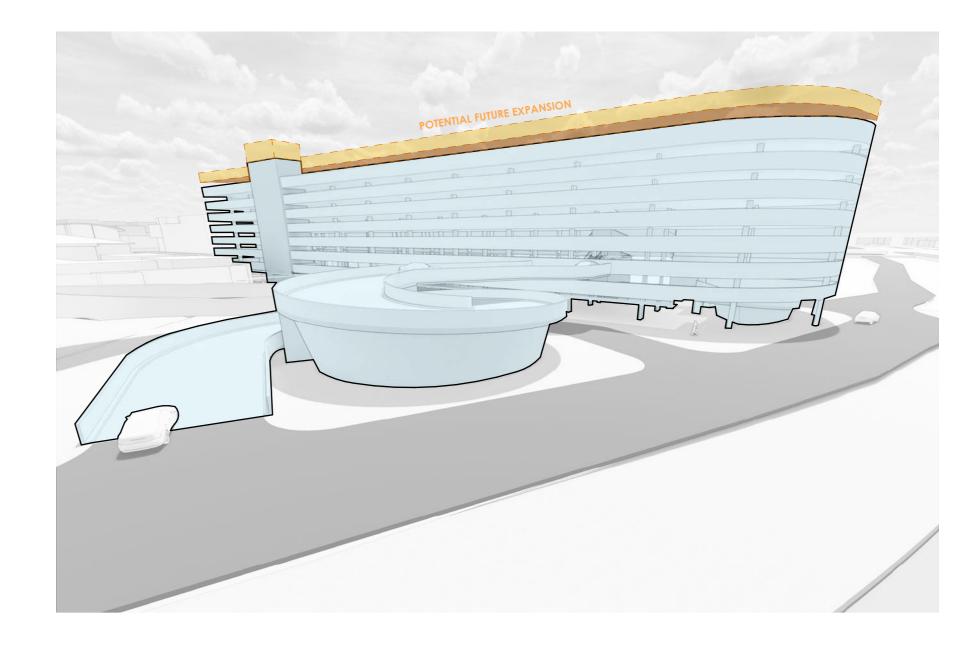
The new MSCP has been designed to meet the demands of the hospital through to 2026/27. This includes capacity for the proposed Main Works (separate SSDA submission) which, combined with the MSCP, comprise the overall LHAP project.

To facilitate future expansion beyond this, the car park structure, services infrastructure and lifting capacity have all been designed with the capacity to allow future construction of one additional level. It is anticipated this would increase the car park capacity by an additional 158 car spaces.

Note that any future works that include additional levels would form a separate planning submission if realised.

The new MSCP has also been designed with future provision and capacity for electric charging stations to facilitate the needs of the growing electric vehicle market.

Any future increase in car parking capcity on site beyond 2026/27 and beyond the two additional levels noted above is difficult to forecast due to a rapidly changing local population and developing town centre as well as the anticipated growth of public transport and automated vehicles.



HEIGHT, BULK & SCALE

HEIGHT

The new MSCP is 25.0 m high, from RL10.5 (Ground) to RL35.5 (top of the lift overrun).

The MSCP includes 7 storeys of split level parking in addition to ground floor undercroft and ongrade parking and sits comfortably within the LEP height control of 35m.

Level 1B canterlevers over the new hospital road at a hight of 4.5m to allow loading vehicles passage.

VISUAL BULK

The multi-storey car park is pressented as a linear horizontal mass. Long elongated facade panels have been aranged in a organic and playful pattern to accentuate this horizontality and hint at movement as they sweep around the curved eastern elevation.

The extent of coloured panels increases and decreases around the car park, providing variation and visual interest, helping to reduce visual bulk.

The metal mesh screeing works with the facade panals, providing transparency during both day and night and avoiding a monolithic outcome.

AN APPROPRIATE SCALE

The design of the new MSCP seeks to respond to a variety of scales from which the building will be perceived.

HUMAN SCALE

The human scale is typically the ground floor where people are interacting directly with the building or walking on adjacent footpaths.

A new undercover walkway creates a sense of enclosure and safety while awnings, street furniture and landscaping all contribute to a positive public domain and a comfortable and appropriate sense of scale. The recessed ground level and landscaped planter area also contribute to a human scale for the building.

STREETSCAPE SCALE

The car park is primarily viewed from the neighbouring schools site to the north and on approach from Burnside Drive, hence it has been designed with a scale and expression that primarily relates to the streetscape and the surrounding hospital campus.

The scale and massing of the multi-storey car park is an appropriate response to both the existing surrounding context and the future anticipation growth of the precinct.



Aerial CGI of the proposed MSCP (excluding proposed Main Works)

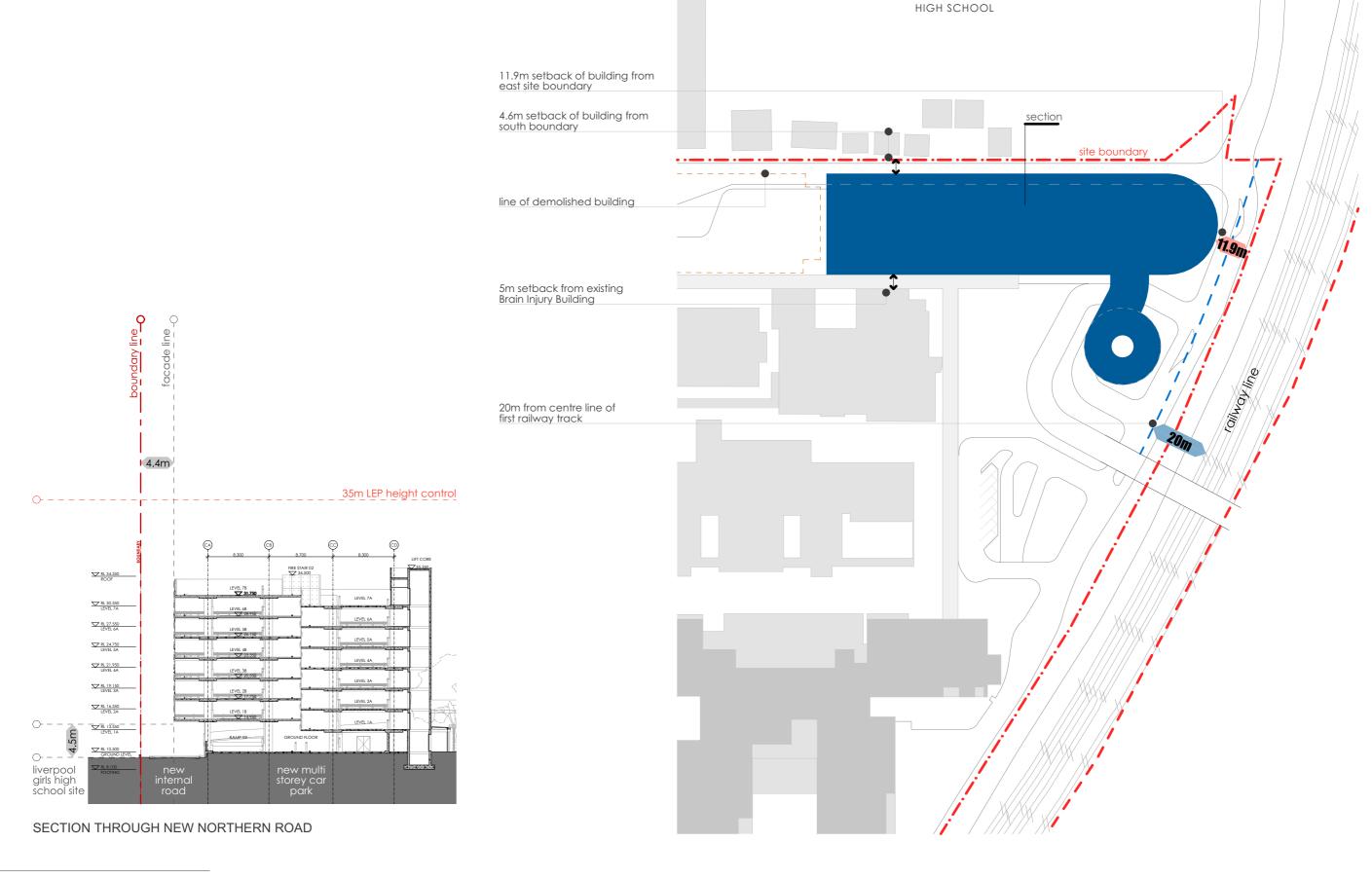


Aerial CGI of the proposed MSCP (excluding proposed Main Works)

LEP HEIGHT CONTROL 35m ABOVE GROUND



WEST ELEVATION



LIVERPOOL GIRLS

ENVIRONMENTAL IMPACTS

ACOUSTIC IMPACT

A Noise and Vibration Assessment has been carried out and included in this SSDA submission.

The report provides an assessment of potential noise from excavation, construction and ongoing operation of the hospital and the potential impacts on surrounding areas, including the Boys & Girls High Schools to the north and the residential apartments to the west.

VIEW IMPACT

There is minimal impact to views from neighbouring properties.

The Boys & Girls High School sites to the north have a number of one and two storey buildings which primarily overlook the school grounds, Forbes Street and Lachlan Street. The existing P2 car park, and hospital campus generally, currently block any distant views from these buildings to the south hence the proposed new Multi-Storey Car Park represents a minor change in this regard.

The removal of the existing P2 car park and the proposal for a new landscaped entry forecourt off Forbes Street (separate SSDA submission) will provide improved visual amenity and opportunities for outlook from existing and future buildings on the schools site.

A View Impact Assessment has been caried out and included on page 4 - 04 of this report.

LIGHT SPILL

The lighting strategy for the MSCP will be developed during the detail design phases of the project and will consider the environmental impact of light pollution and glare on the surrounding precinct.

All lighting shall be designed and documented in accordance with AS/NZs1680 and AS/NZs 4282-1997 Control of the obtrusive effects of outdoor lighting.

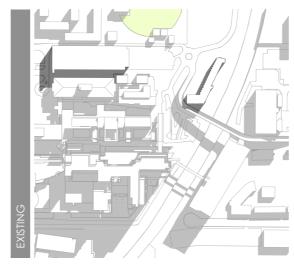
It is anticipated that the impact of light spill on neighbouring properties will be minimal due to the following:

- the school site to the north is not commonly in use during night-time hours
- there are no residential properties in close proximity to the MSCP
- lighting design would be sensitive to the negative effects of up-lighting and other forms of light pollution
- crash barriers would be positioned to block direct glare from vehicle headlights

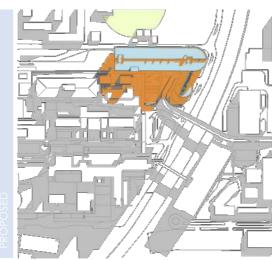
All lighting will be designed and documented in accordance with 'AS/NZs1680 and AS/NZs 4282-1997 Control of the obtrusive effects of outdoor lighting'.

WIND IMPACT

A Wind Assessment has carried out and included in this SSDA submission.



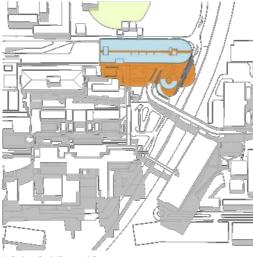
Winter Solstice - 9am



Winter Solstice - 9am



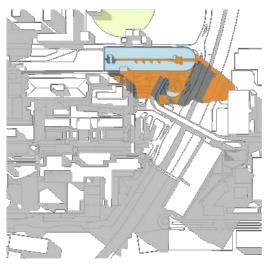
Winter Solstice - 12pm



Winter Solstice - 12pm



Winter Solstice - 3pm



Winter Solstice - 3pm

SOLAR IMPACT

The proposed Multi-Storey Car Park has no over-shadowing impact on neighbouring properties throughout the year. All shadows cast between 9am and 3pm in mid-winter (worst case) are contained on the hospital campus itself, or the adjacent rail line.

The impact on existing buildings within the hospital campus is negligable, contained to parts of the single level Brain Injury building in the morning between 9am to 12pm.







VISUAL IMPACT ASSESSMENT

The visual impact of the proposed new Multi-Storey Car Park is largely mitigated by the limited number of neighbouring properties or surrounding public domain in this area of the hospital campus.

Visual impact of the Multi-Storey Car Park from Elizabeth, Campbell or Forbes Streets is negligable.

The primary visual impact is on the schools open space to the north and the view on approach to the hospital from Burnside Drive. The visual impact assessment opposite illustrates this impact.

Considering the scale of the schools open space (current size approx 250m x 150m) this impact is considered to be acceptable. There is no overshadowing of the building on schools open space and extensive consultation with Schools Infrastructure NSW throughout the design process has not raised any concerns.

The visual impact on existing buildings within the hospital campus is minimised due to the neighbouring buildings (Brain Injury, Mental Health and Don Everett) being mostly inward looking with little outlook in the direction of the new car park.







SUSTAINABILITY

The project seeks to maximise environmental initiatives to reduce the carbon footprint of the LHAP development, both during construction and operation.

The project team is committed to exceeding sustainability targets where possible and appropriate. Key ESD considerations include:

NATURAL VENTILATION

The car park is 100% naturally ventilated with no active or mechanical systems required.

DURABILITY AND LONG LIFE

Concrete structures are durable, long lasting structures that prolong the life span of the car park compared to other forms of construction. Other materials have been selected for their durability including steel, aluminium and blockwork.

ENERGY EFFICIENCY

Energy efficient light fittings will be used to minimise energy consumption. As part of future-proofing, the design has allowed for the provision of electric vehicle charging stations.

IOW VOC

Low VOC materials, and in particular paint, applied finishes and sealants will be used throughout.

MINIMISE LIGHT SPILL

The combination of crash barriers installed at the height of vehicle headlights, and the façade systems adopted both contribute to minimising light spill from cars driving within the car park at night time.

LANDSCAPING

The landscape design by Clouston Associates minimises the extent of impervious hard landscaping where possible with plant selections to be typically durable, low maintenance and low water usage.

ELECTRIC VEHICLE CHARGING

Electric vehicle charging stations are to be provided while facilitating future provisions.



Concrete that has reduced portland cement content, a percentage of captured or reclaimed water and alternate aggregate materials



All facades incorporate free open are to allow 100% natural ventilation of the car park



Electric vehicle charging stations to promote use of electric vehicles



Increased landscaped areas to reduce the urban heat island effect with durable, low-water use planting and water capture for irrigation where possible



Up-front planning, recycling and re-use of waste material to avoid waste to landfill during construction



Products and materials with a low-embodied energy and that are durable, long-lasting and require little maintenance or replacement



End-of-trip facilities, bicycle parking and changemanagement policies to promote the use of public transport and car-sharing



Sustainable water management with WELS rated tapware and exploration of options for water capture and re-use for irrigation and cooling towers



Energy efficient light fittings to minimise energy consumption

CPTED

OVERVIEW

The Crime Prevention through Environmental Design (CPTED) guidelines under Section 79C of the EP&A Act 1979 are based on key principles for designing buildings and places that are safe, secure and deter criminal behaviour.

These key principles include:

- Surveillance
- Access Control
- Territorial Reinforcement
- Place Management & Maintenance
- Vulnerability

LHAP has adopted the principles of CPTED in developing the site master plan and concept planning to establish a safe and secure environment for staff, patients, contractors and visitor. Details for each of the principles are outlined below.

SURVEILLANCE

Passive surveillance will be encouraged through the incorporation of design features that maximise visibility of people using a public space. The following principles will be adopted and / or addressed to achieve this:

- Facilitation and promotion of passive surveillance into public spaces from new and existing buildings wherever possible
- Promotion of passive surveillance from other users within the space by designing and encouraging a mixture of uses and users at different times of the day and night effectively activating the space for longer periods
- Providing unrestricted sight lines between spaces and avoiding blind spots where possible
- Providing lighting to ensure safe use and effective surveillance of the space after hours
- Connection of spaces where possible to promote pedstrian movement

ACCESS CONTROL

Access Control delineates spaces open to the public or where these spaces are restricted. The design will incorporate natural barriers such as roadways and landscaping, electronic and physical barriers through the use of the following:

- Limiting the number of public entries into the hospital and securing these after hours
- Provision of CCTV monitoring of public areas to the hospital linked back to a security monitored point
- Providing a 24-hour security station at the Emergency Department that can respond to other part of the hospital during occasions of duress
- Providing electronic access points of entry and intercoms
- Providing access control to clinical departments after hours
- Providing 24 hour access control to engineering services areas and other sensitive sections of the hospital

TERRITORIAL REINFORCEMENT

Territoriality provides social regulation through definition of space. The following principles will be adopted and / or addressed to achieve this:

- Clearly defining spaces into public and back-of-house through physical barriers or appropriate directional means
- Not mixing public, patient and back-of-house activity in the same space and therefore causing confusion in the diverse users of the space
- Clearly identify control points to clinical areas
- Ensure that circulation patterns are unambiguous and do not create confusion in offering too many options for travel
- Reinforcing public areas by introducing amenities such as seating and other elements of activation attracting desired users of the space therefore deterring undesirable activity
- Clearly defining zones for public lifts and non-public (clinical) lifts allowing staff secure movement without the need to cross non-secure public zones

PLACE MANAGEMENT AND MAINTENANCE

Maintenance is a reinforcement of ownership of property where as decline in space management and maintenance signifies reduced jurisdiction by the owners of the space and therefore less control in relation to access. The following principles will be adopted and / or addressed to achieve this:

- Fall protection from heights to include increased balustrade heights and or fully enclosing mesh
- External spaces are to be designed with robust finishes requiring minimal maintenance
- Ensuring clear observation lines to open areas that would be of high risk to the public such as loading docks and staff parking zones
- Restricting access to sensitive areas such as goods lifts

VULNERABILITY

The aspect of how vulnerable a person feels in a space will impact on the use of that space limiting its activation and attracting undesirable activity. The following principles will be adopted and / or addressed to achieve this:

- Effective lighting of spaces both natural and artificial
- Provision of clear exit (escape) pathways allowing users of a space the option of more than one route out of the area
- Avoiding blind spots in spaces and ensuring that distance visibility is available to all users of the space



Controlled access points with surveillance, clear lines of sights and lighting



Connection of spaces, lighting, durable materials



Access control for restricted areas

GA NSW REVIEW PROCESS

2-05.1 OVERVIEW

The State Design Review Panel (SDRP) pilot program was established to deliver the principles and ambitions of Better Placed and to provide a consistent, state-wide approach to reviewing the design quality of State Significant projects.

The LHAP project team have had the opportunity to present to the GA NSW office on three occasions, once as an informal briefing with a focus on the MSCP and then two formal SDRP sessions regarding the Main Works.

Generally the feedback has been supportive and complimentary of the design approach and work undertaken to date. The project team has welcomed the process and developed the design to take into account commentary provided where possible.

The following is a brief summary of the sessions held and the design response to commentary provided.

2-05.2 INITIAL GA NSW REVIEW

Review of MSCP and overall LHAP Master Plan 4th September 2019

The design and approach of the overall LHAP Master Plan was well received and supported, in particular:

- The concept and staging Master Plan
- The clarity of the movement diagram and connections to surrounding context
- The integration of wayfinding and landscaping

Further comments were provided relating to the MSCP which will be addressed in the MSCP SSDA Design Report to be submitted separately.

2-05.3 GA NSW SDRP SESSION #1

Review of Main Works and overall LHAP Master Plan 23rd October 2019

The Master Plan analysis and rationale of the project were presented and generally well supported.

The focus of the presentation was primarily on the Main Works, with no issues or items raised for further discussion relating to the MSCP.

2-05.4 GA NSW SDRP SESSION #2

Review of Main Works Facade and Landscaping 4th December 2019

The SDRP was complimentary of the project teams response to the commentary from SDRP #1 and generally suppported the facade and landscape design approach.

The focus of the presentation was primarily on the Main Works, with no issues or items raised for further discussion relating to the MSCP.

Refer to CLOUSTON Associates Landscape Design Report for details of SDRP Session #2 commentary relating to the landscape design.

2-05.5 GA NSW SDRP SESSION #3

Review of Main Works Facade, Landscaping and MSCP 25th March 2020

The SDRP was complimentary of the project teams response to the commentary from SDRP #2 and supported the EIS Submission for both the Main Works and MSCP.

2-05.6 ITEMS FOR FUTURE SDRP REVIEW

No further commentary or recommendations were made by the SDRP with respect to the project. The SDRP noted that no further reviews were necessary unless the project team requested SDRP input.

fitzpatrick+partners

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Architecture is a fine balance between innovative design solutions and the practical importance of fitting buildings to people, the environment and budget.

Since its foundation, we have created an inspiring architectural response to unique problems throughout Australia. Our work originates from a particular stream of architecture that is independent of the self-conscious style based approach and is more about technical problem solving.

Our approach is much closer to engineering than the high aesthetic ground, but is not unaware or unconcerned about the aesthetic outcome. Instead, we see this as more of a result of good thinking, than as a goal in and of itself.

We create solutions related to the immediate environment and the context of the project, resulting in buildings that are a pleasure in which to be live and work and be educated. Our studio does not limit itself to a particular scale or typography of project, preferring to work across all scales and building uses, where we believe we can add value to the design and construction process.

