

MAITLAND HOSPITAL

# DESIGN REPORT

MAITLAND HOSPITAL DEVELOPMENT - METFORD ROAD

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## 1 - EXECUTIVE SUMMARY

# EXECUTIVE SUMMARY

## 1-1 OVERVIEW

In January 2017 Fitzpatrick+Partners were commissioned by NSW Health Infrastructure (HI) to develop a Master Plan for the new Maitland Hospital on a greenfield site in Metford, NSW.

The developed Master Plan outlined in this report forms the basis for two primary project objectives:

- A State Significant Infrastructure (SSI) Application to the Department of Planning & Environment
- Supporting reference design documentation for a Request for Tender (RFT) package to be issued as part of a tender process to establish a public Hospital

This master plan has also formed the basis of the Concept Design for the hospital which has been developed with an Executive User Group from Hunter New England Health.

For the purpose of this Design Report, only HAC owned Lot 7314 is referenced noting the November 2017 SSI declared area includes Part Lot 401. The inclusion of Part Lot 401 does not alter the site masterplan or building envelope design rationale and planning within this document. Refer to Maitland Hospital Stage 1 EIS Submission Report for plans inclusive of Part Lot 401.



# EXECUTIVE SUMMARY

## 1-2 SCOPE DESCRIPTION

The Maitland Hospital at Metford will comprise of a seven storey building (ground floor, five upper levels and a lower ground floor) incorporating the following clinical services:

- Emergency medicine
- Medical Imaging
- Ambulatory Care and Allied Health
- Interventional services
- Intensive Care
- Close Observation Unit
- Maternity and Special Care Nursery
- Women's Inpatient Services
- Paediatrics Inpatient Services
- Surgical and medical Inpatient Services
- Oral Health, Chemotherapy and Renal Services
- Mental Health
- Rehabilitation Services

In addition to the above the facility incorporates:

- Facility Management services supporting the various clinical departments
- Sterilising services
- Pathology Services
- Pharmacy Services
- Clinical Information Services
- Research and Education
- Administrative Functions

The facility will accommodate a total of 339 beds (day and overnight).

# EXECUTIVE SUMMARY

## 1-3 DESIGN APPROACH

The reference design has adopted a design based on a two level podium with a two-wing tower configuration above, linked by primary lift cores.

This configuration has been adopted to maximise the effectiveness of the building to cater for the various needs of all its users being public, patients and staff in addition to establishing critical clinical links between the various hospital departments, supporting clear wayfinding principles and developing a supportive treatment and working environment for all users.

The design rationale is explained in detail in Section 3 of this report.

Structurally the building has been designed to incorporate an 8.4m metre grid having a typical 4.5 metre floor to floor height with the lower ground floor increasing to a 5 metre floor to floor height.

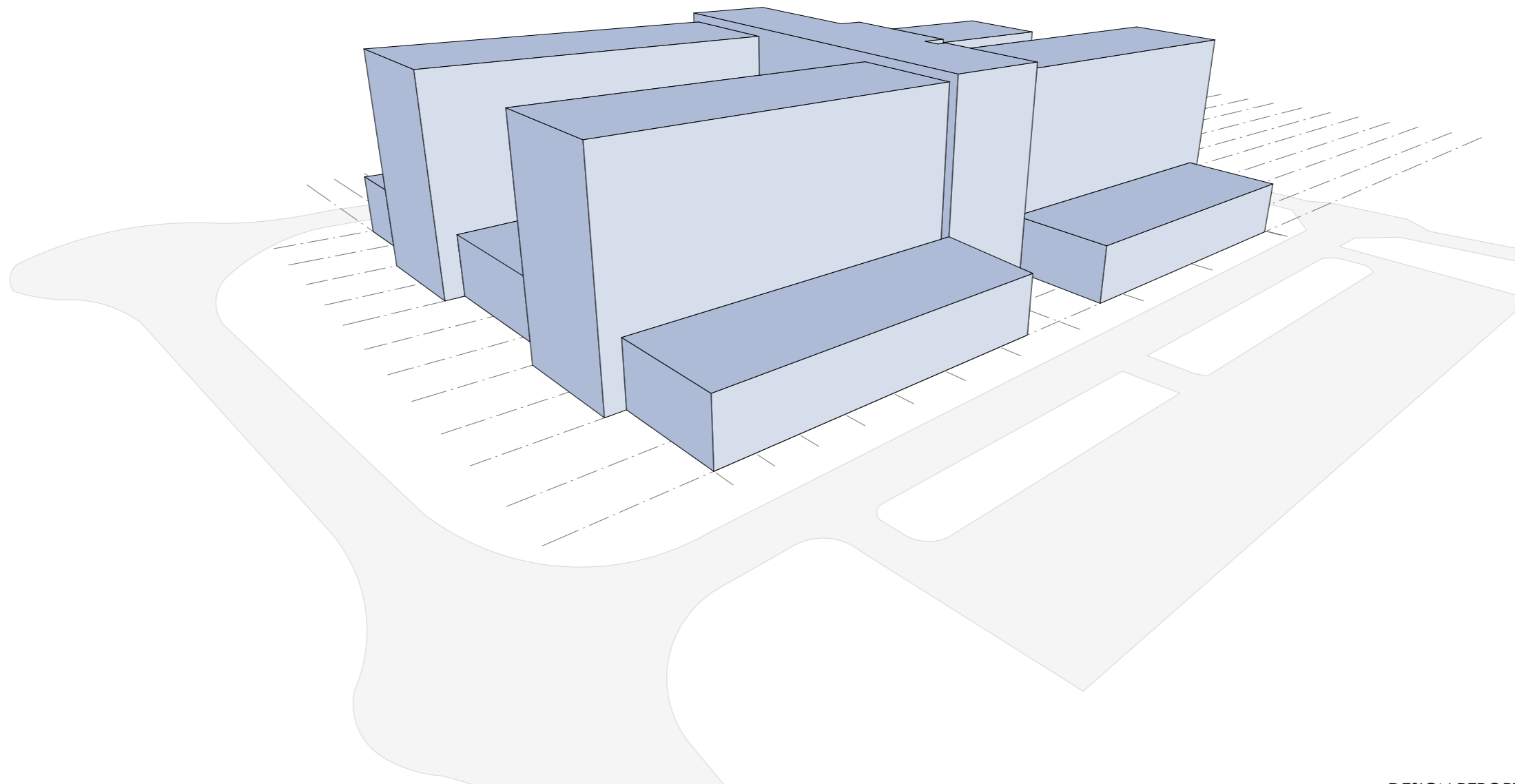
All clinical and support areas of the Hospital have been designed to the current Australian Health Facility Guidelines, Health Infrastructures' special standards and incorporating assumed models of care within the planning.

The design of the facility has taken into consideration the future expansion of clinical and support units within the Hospital through the siting of the building to allow expansion to the east and south of the current footprint.

The ground floor of the Hospital has been designed to develop a supportive environment for both the public and the staff.

A distinct configuration of Hospital streets has been established that clearly identify the various key functions and access routes through the facility. This has been achieved through the incorporation of waiting areas, visually accessible reception and information points and the incorporation of a high degree of natural light through external walls and light wells.

In addition, a number of retail facilities have been established along the Hospital streets acting as break-out points and further reducing the clinical character commonly associated with health facilities of this magnitude.



# EXECUTIVE SUMMARY

## 1-4 CLINICAL PLANNING APPROACH

### FRONT OF HOUSE / RETAIL

All entrance functions and retail spaces have been designed along two major hospital streets on ground level.

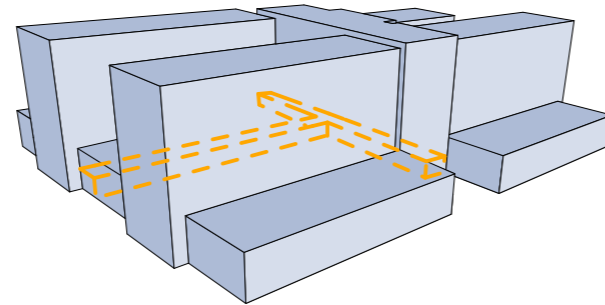
The two streets feed all visitors into the hospital from the public entrances and have direct access to the lift core.

The streets will be highly active, social and vibrant spaces.

The entry function spaces are all well lit and have a number of waiting / break out spaces for the comfort of visitors.

Functions include:

- Admissions
- Spiritual Care
- Satalite pharmacy
- Retail
- Cafe



### EMERGENCY DEPARTMENT

The Emergency Department (ED) has been located on the ground floor of the eastern sector of the Hospital podium, providing high visibility from Metford Rd and the main entry into the Hospital site.

It has been planned to give direct access to interventional, acute, imaging and inpatient facilities through clinical corridors and clinical lifts without the need to traverse public areas.

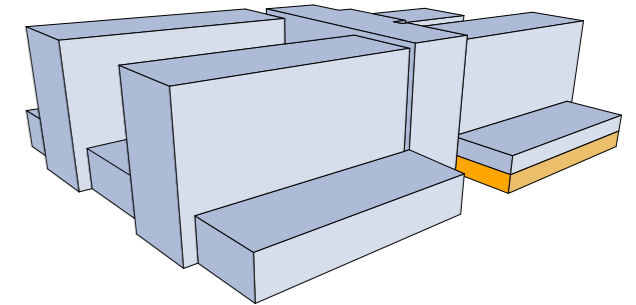
Patient management into the department has been planned to segregate ambulance entry from the main public entry while allowing the triage zone to manage both patient flows, with ambulance traffic having their own dedicated road entry.

Internally, the unit has been planned with clear patient flows addressing acuity levels and patient type (e.g. adult, paediatric, short stay, fast track) allowing appropriate clinical management.

The resuscitation bays have been located immediately adjacent to the ambulance entry with direct access to all units of the ED and immediate access to adjacent medical imaging unit.

Patients requiring acute treatment can be transported directly from the triage bay or ambulance entry to the various acute treatment areas, while patients with lower acuity can be streamed through a fast track zone.

The ED has been located adjacent to the Hospitals main Medical Imaging unit providing specialist imaging modalities.



# EXECUTIVE SUMMARY

## 1-5 CLINICAL PLANNING APPROACH

### MEDICAL IMAGING

Medical Imaging incorporates the following functional planning units:

- General X-Ray
- Fluoroscopy
- Ultrasound
- MRI
- CT

The Medical Imaging Unit has been located on the ground floor of the Hospital with direct public access off the main Hospital street and direct access to the ED and clinical lifts that allow discrete movement for staff managed patient flows.

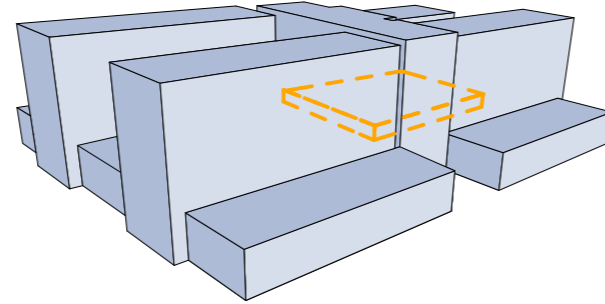
The unit has been designed with all primary modalities (gen x-ray, CT, Fluoro, MRI and ultrasound) planned around the central core of the unit.

The ultrasound rooms have been located closer to the public entry of the unit facilitating the high flow character of these rooms.

Reception and waiting areas have been planned around the main hospital street allow the public clear and direct access to the unit.

The unit has also been planned to provide direct access from the Ambulatory Care and Allied Health units on ground floor.

The location of the MRI adjacent to primary corridors of the building will facilitate future equipment replacement with minimum disruption to the functioning medical imaging department.



### OPERATING THEATRES & PERI-OP

The Operating Theatre Suite is located on Level 1 and has been planned around a primary clinical corridor allowing direct access to the operating theatres, Cath Lab and Endoscopy rooms.

This model allows all theatres to access the support areas for sterile stock, equipment and other support facilities.

The unit is accessed through a central control point managing the patient flow into the theatre suite. Access is via the clinical lifts which link the suite to the other acute services within the Hospital. The public lift also services this floor giving controlled public access.

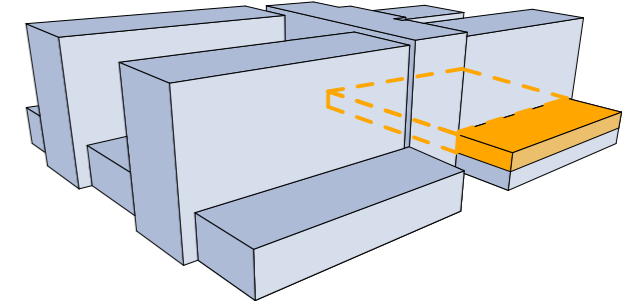
Stage 1 Recovery has been planned adjacent to the theatres with direct corridor access to the recovery bays. This in turn is linked to the Peri-operative zone, accommodating the stage 2 and 3 recovery bays, and the ICU and COU which is also located on level 1.

The theatre suite has direct access to the birthing unit also located on level 1, providing immediate response times for emergency deliveries.

Dedicated CSSD lifts (passenger and equipment) connect the theatre suite to the sterilising unit allowing staff to manage the flow of sterile and non-sterile goods through the theatres.

The unit has been designed to provide a high degree of natural light into the facility with a number of theatres being planned against external walls allowing controlled light and views into the theatres.

The structured corridor system has been planned to facilitate direct and efficient access to all areas and establish clear wayfinding principles.



# EXECUTIVE SUMMARY

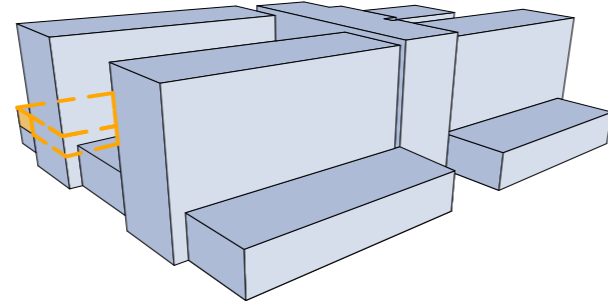
## 1-6 CLINICAL PLANNING APPROACH

### INTENSIVE CARE UNIT

The 8 bed Intensive Care Unit (ICU) is located on Level 1 of the Hospital adjacent to the Operating Theatres with direct access from the theatre suites.

Access to the unit is via either the public lifts for visitors with controlled access to the ICU or via the clinical lifts for staff and patient transfers.

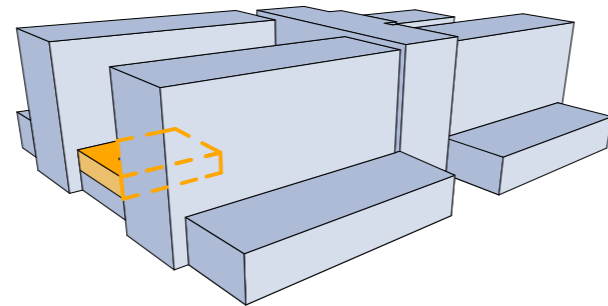
The patient rooms have been planned around a central staff station maximising staff supervision and monitoring of patients. Each room has direct access to natural light.



### CLOSE OBSERVATION UNIT

The 14 bed Close Observation Unit (COU) is located adjacent to ICU on Level 1. It has direct access to the theatre suites and clinical links to the Birthing Unit.

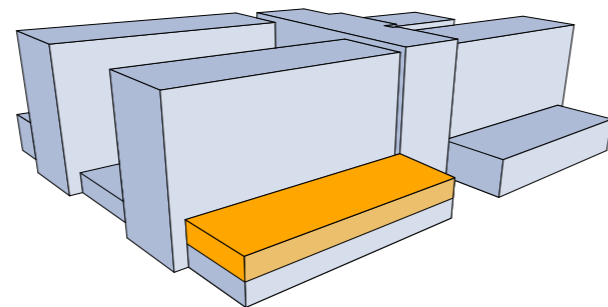
The unit has been planned in a race track configuration around a central support station maximising natural light and staff observation. All patient bays have access to natural light.



### BIRTHING AND SPECIAL CARE NURSERY

The birthing unit is located on level 1 with direct access to the the special care nursery and operating suite. The unit has been designed to incorporate six birthing suites and two assessment rooms based on a race track configuration ensuring all birthing rooms have direct access to natural daylight and views.

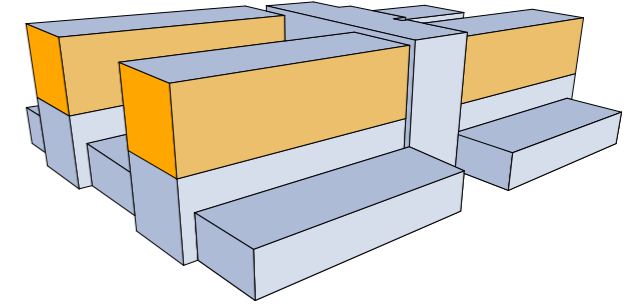
The special care nursery has been planned to have direct access from the birthing unit and incorporates 12 cots in total, one designed as an isolation room.



### INPATIENT UNITS

The inpatient units have been designed around a single corridor system based on a two grid configuration. Each wing typically accommodates 28 beds based on a combination of single & two bed rooms in a ratio 60% single bedrooms.

Each inpatient unit has been planned within one wing of the building with each two wings have access to direct shared facilities between them. Access to all inpatient units is through the public lifts for visitors and clinical lifts for staff and patient flow.



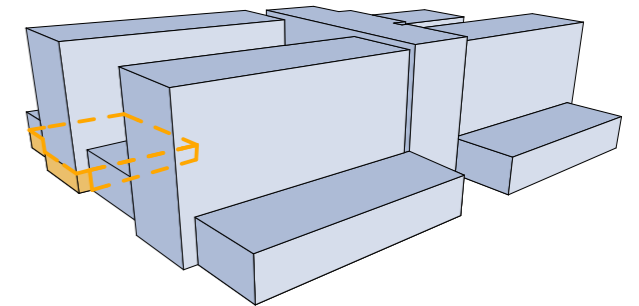
### DAY SERVICES

The Day Services within the Hospital include a chemotherapy unit, a renal unit and an oral health unit.

The units have been planned on the ground floor with direct access for the public off the main entry and primary Hospital streets facilitating easy access for first time and returning patients.

Each patient bay has been planned around a central staff station and has been designed to maximise access to natural daylight which can be controlled to address issues of light sensitivity for some patients receiving treatment.

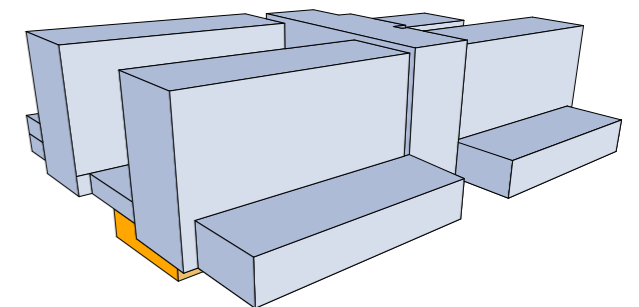
Support areas are centrally located for each unit with direct access to public and clinical lifts for visitors and patient transfers.



### PATHOLOGY & PHARMACY

The main pathology labs and supports services have been located on the lower ground floor as this unit does not require direct public access, a specimen collection unit has been planned on the ground floor where the public can access pathology and other services within the Hospital.

As per the Pathology unit, the production and administrative aspect of the Pharmacy has been located on the lower ground floor with a satellite Pharmacy planned centrally on the ground floor of the Hospital



# EXECUTIVE SUMMARY

## 1-7 CLINICAL PLANNING APPROACH

### AMBULATORY CARE AND ALLIED HEALTH

The Ambulatory Care Unit (AC) and Allied Health Units (AH) have been planned on the ground floor with direct access for the public off the main entry and primary Hospital streets facilitating easy access for first time and returning patients.

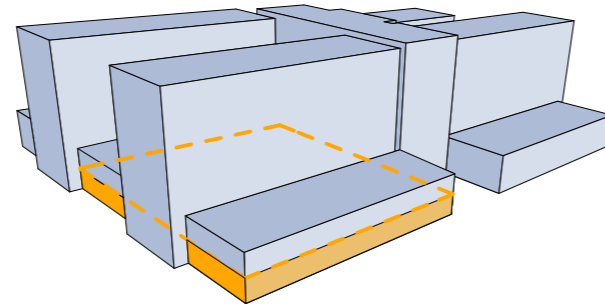
The AC patient consult and interview rooms have been planned as pods allowing the configuration of the unit into specialties (e.g. Women's Health, Paediatric and Adolescent and Adult services).

Core staff areas have been planned central to the unit allowing direct access from all patient areas.

The unit has been designed to maximise natural light to patient areas with corridors terminating on exterior walls reducing the clinical character and facilitating wayfinding through the unit.

The AH has been located adjacent to the AC and directly off a primary Hospital street this will facilitate easy public access and minimise patient flow for patients requiring treatment at both units. AH shared consult/ treatment and interview rooms with AC

Both units have direct access off the Hospital street to the main public lifts and support services such as imaging, specimen collection and pharmacy services.

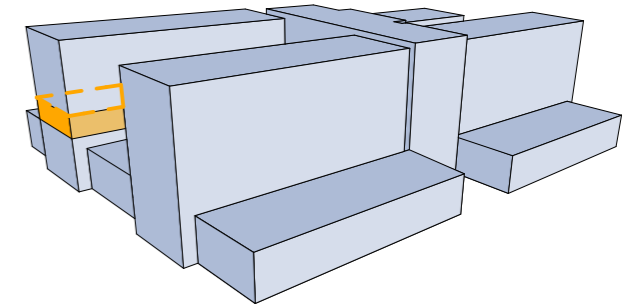


### INTEGRATED MENTAL HEALTH UNIT IPU

The mental Health Unit (MHU) has been designed on Level 2 of the Hospital tower and has been separated into an acute and high dependency unit each with their own support services.

The unit is accessed by either the public lifts for visitors and clinical lifts for staff and patient transfers or where patients require transport to other clinical services.

An integrated 6 bed PECC unit is located adjacent to the MHU to provide discrete and safe access for staff escorted patients without the need to traverse public zones of the building.





## 2 - SITE ANALYSIS

# SITE ANALYSIS

## 2-1 LOCATION

The site for the Maitland Hospital redevelopment is located in the suburb of Metford within the city of Maitland in the Lower Hunter Valley precinct of NSW, designated Lot 7314 D.P.1162607.

Metford is located within the Hunter New England Local Health District. Major local hospitals within the district include John Hunter Hospital, Maitland Hospital, Cessnock District Hospital, and Kurri Kurri District Hospital.

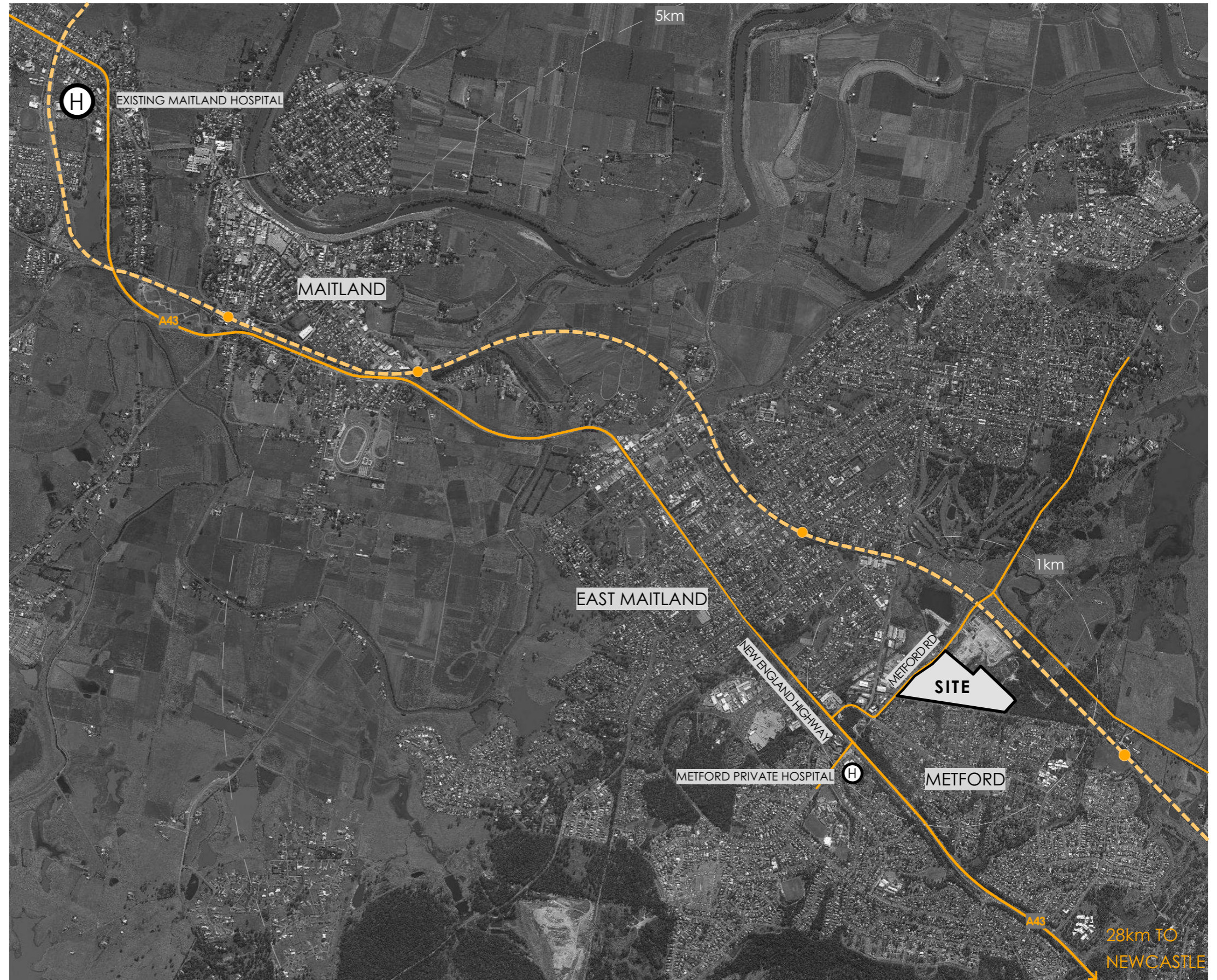
The site is located off Metford Road between the New England Highway and Raymond Terrace Road in Metford approximately 5 km east of the Maitland CBD and the existing Maitland Hospital.

Site selection has been based on its strategic location between Newcastle and Maitland and is central to the Maitland Valley future growth corridor.

The site's strategic position is critical in relation to the Hunter New England Local Health District's future clinical growth as the existing Maitland Hospital is the busiest facility in the Hunter Valley providing the majority of the public health services required by the resident population.

The immediate surrounding environment of the Hospital site includes residential development to the south, recreational and open space to the north and west and natural and partly regenerated bushland to the east.

The site provides a number of opportunities in relation to future development and expansion of the proposed health care service with vacant lots to the north and east of the proposed Hospital.



# SITE ANALYSIS

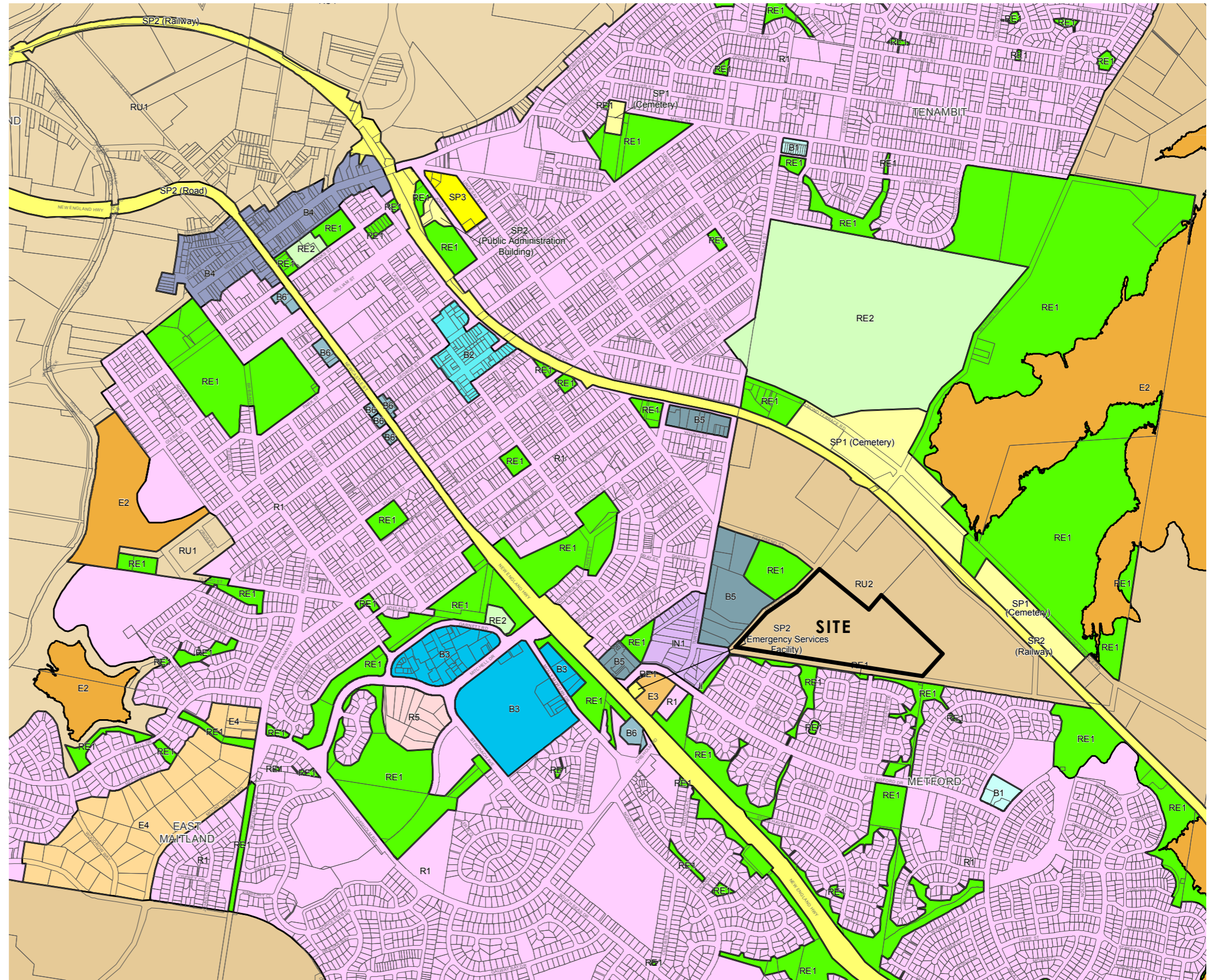
## 2-2 ZONING

The current zoning of the site is RU2 Rural Landscape.

To the south of the site the zoning is predominantly R1 being General Residential with small pockets of Public recreation zoning (RE1). A sensitive approach to the development will be required to mitigate any potential impact on these properties.

The area to the west of the site is B5 zoning being Business Development.

The adjacent lots to the north and east of the site fall under the same zoning as the subject site, being RU2 Rural Landscape.



Source: Maitland LEP 2011 Land Zoning Map - Sheet LZN\_004D

# SITE ANALYSIS

## 2-3 DIMENSIONS, SUN PATH LOCATION

### LOCATION

The site, Lot 7314, has a total area of 17.293 hectares forming part of the larger 42Ha Metford Brickworks and quarry precinct. CSR operations ceased on the site in 2012.

The site has undergone remediation works, including decontamination and bushland regeneration. Portions of the site still show vestiges of the previous quarry activities.

The site is vacant of any structure or items of historical significance.

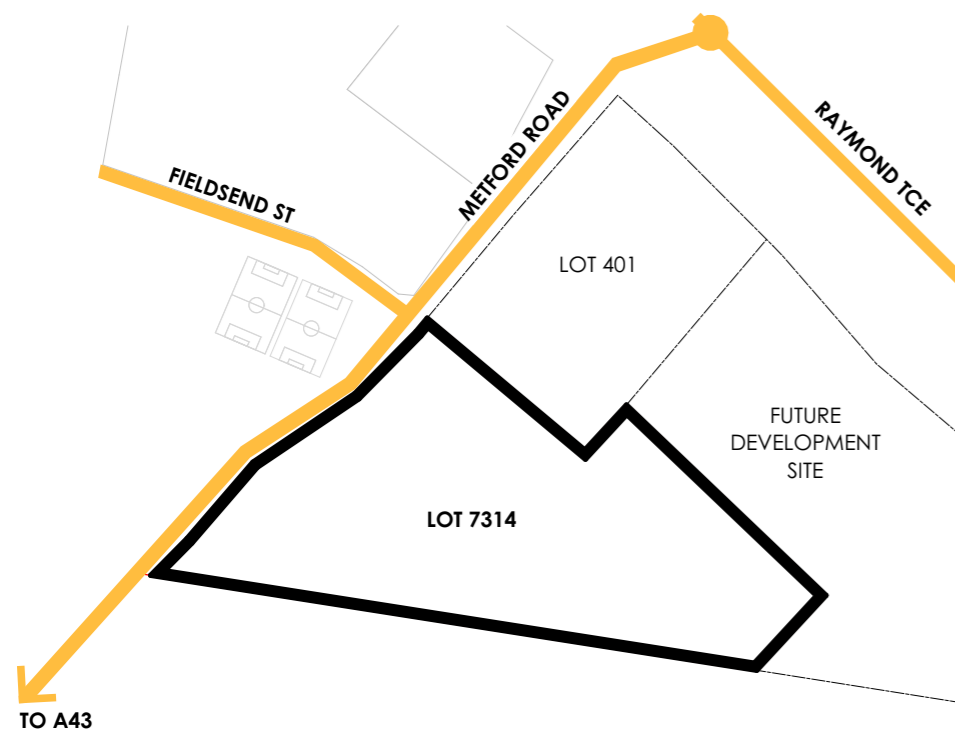
### DIMENSIONS

The site is approximately triangular in shape with a street frontage to Metford Road of 450m and a longest boundary of 735m.

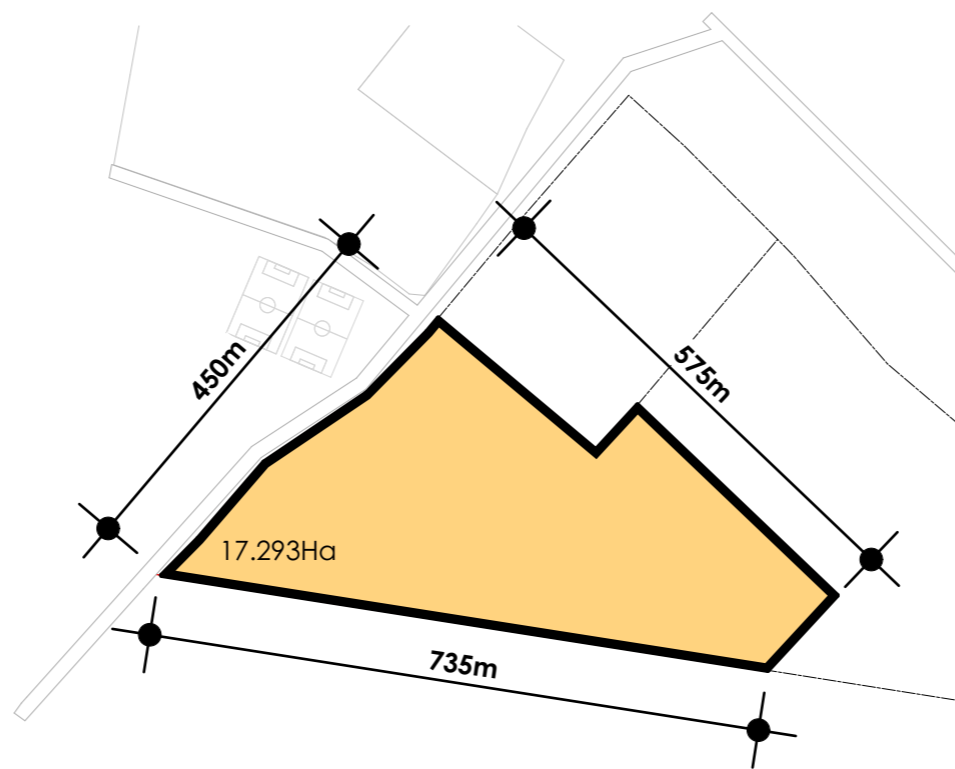
### INDICATIVE SUN PATH

Metford Road faces North-West which suggests a potential building layout at 45deg to true north.

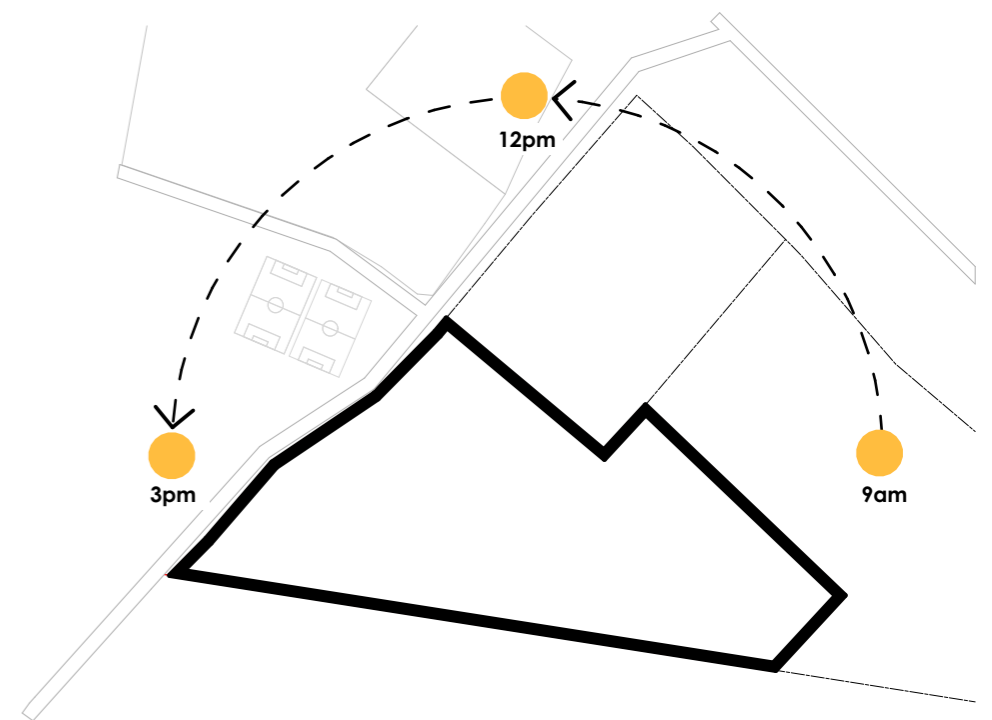
Due to the size, layout and context of the site however, multiple configurations are possible hence there is no predominant orientation or building aspect implied by the site.



LOCATION



DIMENSIONS



INDICATIVE SUN PATH



# SITE ANALYSIS

## 2-4 ENVIRONMENTAL ANALYSIS

### SITE LEVELS

The site is varied in topography, with a general fall across the site to the eastern-most corner.

Metford Road has a rise and fall of approximately 7.0m from the highest to the lowest points along the site boundary. Vehicular approach from both the north and south are from elevated positions allowing good visibility of the site and main entrances.

The middle of the southern boundary is the highest point of the site, which should assist in mitigating the impact of the development on the residential properties to the south.

The centre of the site is undulated due to the previous mining activity requiring a degree of re-leveling to establish a proper base level for the hospital.

### FLOOD RISK

The site itself is generally not affected by a 1 in 100 year flood event, being the high-point of the area.

Access to the site is affected however, with the north approach via Metford Road off Raymond Terrace being a high hazard flood risk directly under the Metford Road / rail crossing.

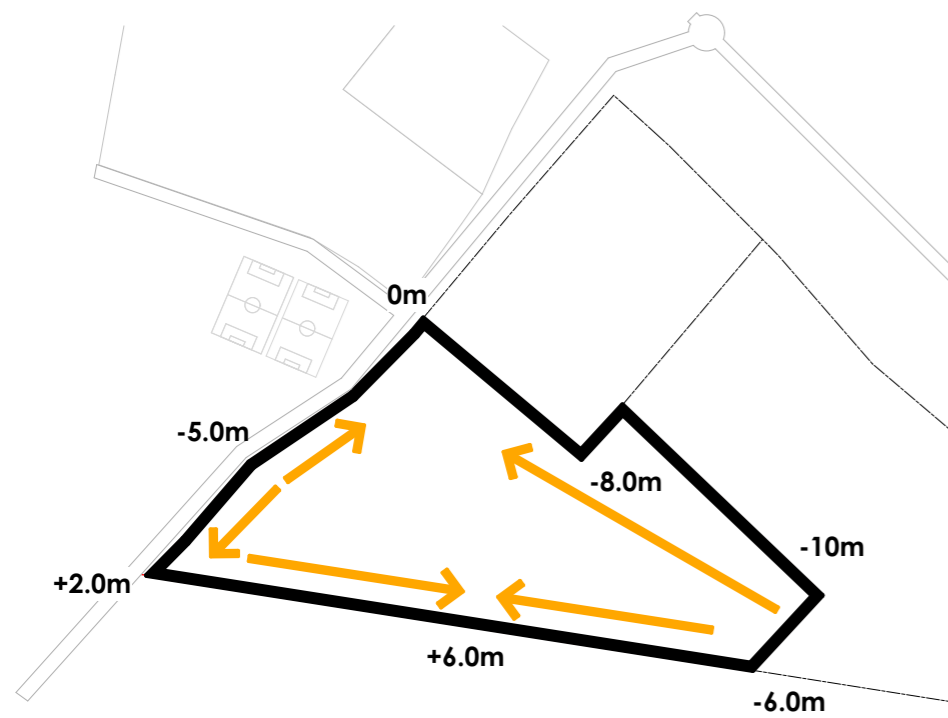
Access from the south via Metford Road off the A43 is not compromised by 1 in 100 year flood event.

### BUSHFIRE RISK

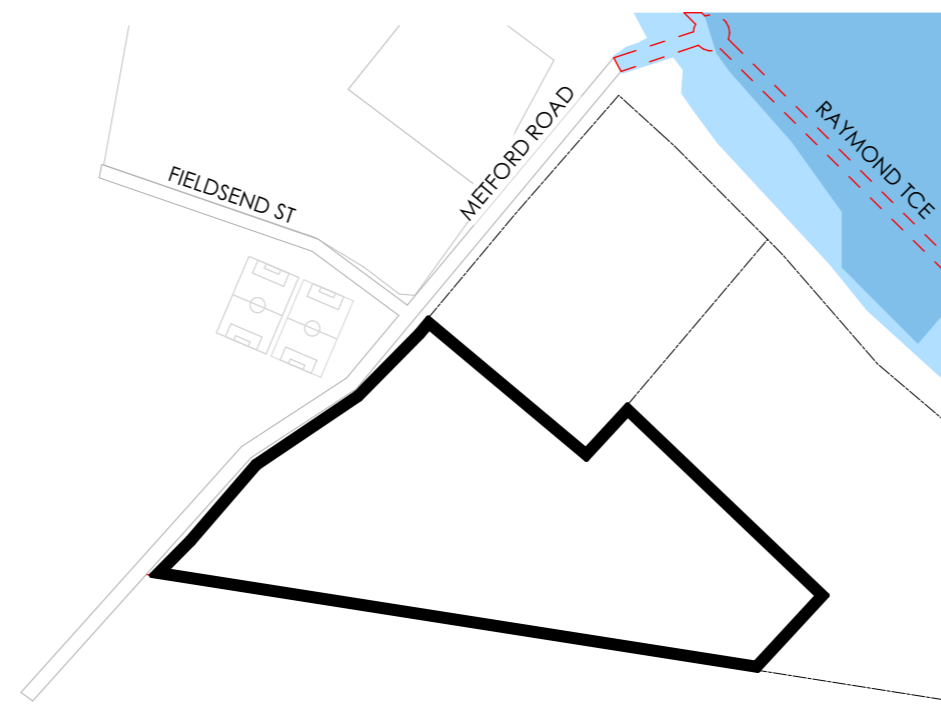
There is a potential bush fire risk on the south-west corner of the site due to an established Iron Bark forest over 1Ha in size.

Careful management is required to mitigate this risk including Asset Protection Zones around the hospital development.

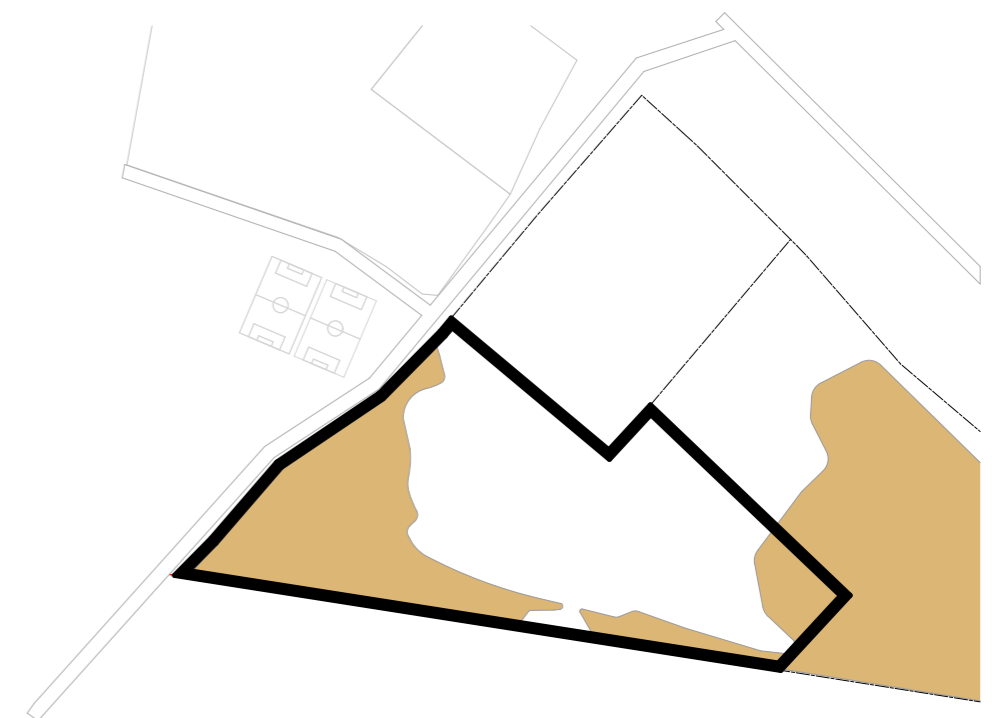
There is no bush fire risk to the north or east of the site.



SITE LEVELS



FLOOD ZONE



BUSHFIRE RISK



# SITE ANALYSIS

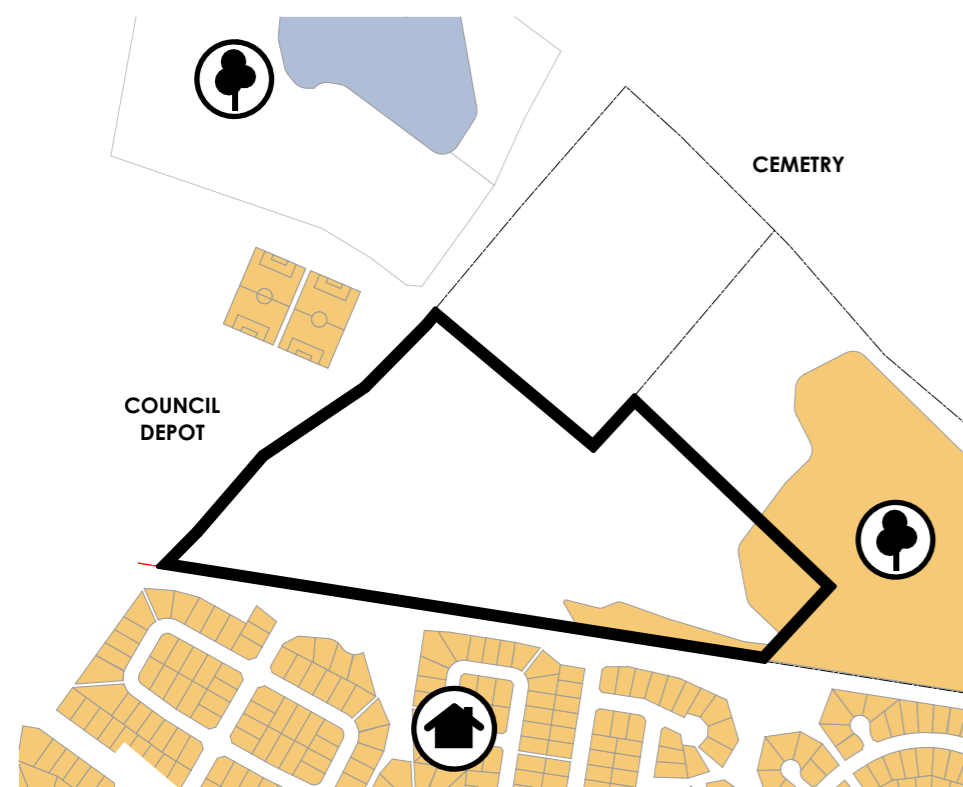
## 2-5 LOCAL AMENITIES, VIEWS, SITE FEATURES

### LAND USE

The surrounding land is primarily residential and recreational use. There are some commercial buildings along Metford Road, opposite the south-west corner of the site.

The residential area to the south is within close proximity to the site boundary, separated by a high voltage power corridor. Careful consideration of building placement and design is required to ensure the impact on these properties is minimised.

The site to the east was part of CSR's original holding and is currently regenerated bush land. This will be returned to crown land in future.



LAND USES

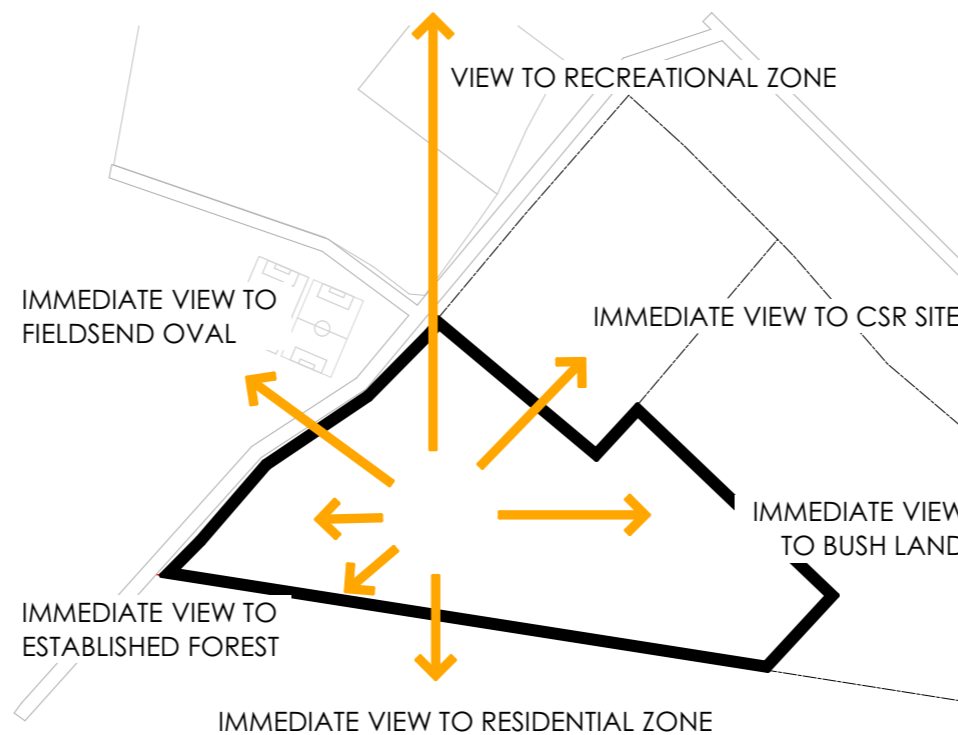
### VIEWS

The site affords a number of key views, both at low level across the site itself and at higher levels for more distant views.

The two predominant views are to Fieldsend Oval to the west and across the greater CSR site and regenerated bush land to the east. There are also high level distant views to the north towards Easts Leisure and Golf Club and the Memorial Flying Field.

The site has opportunity for low level views across extensive vegetation to the south and east, including the established Iron Bark Forest.

High level views towards the residential zone to the south should be treated carefully to avoid impacting on the visual privacy of properties.



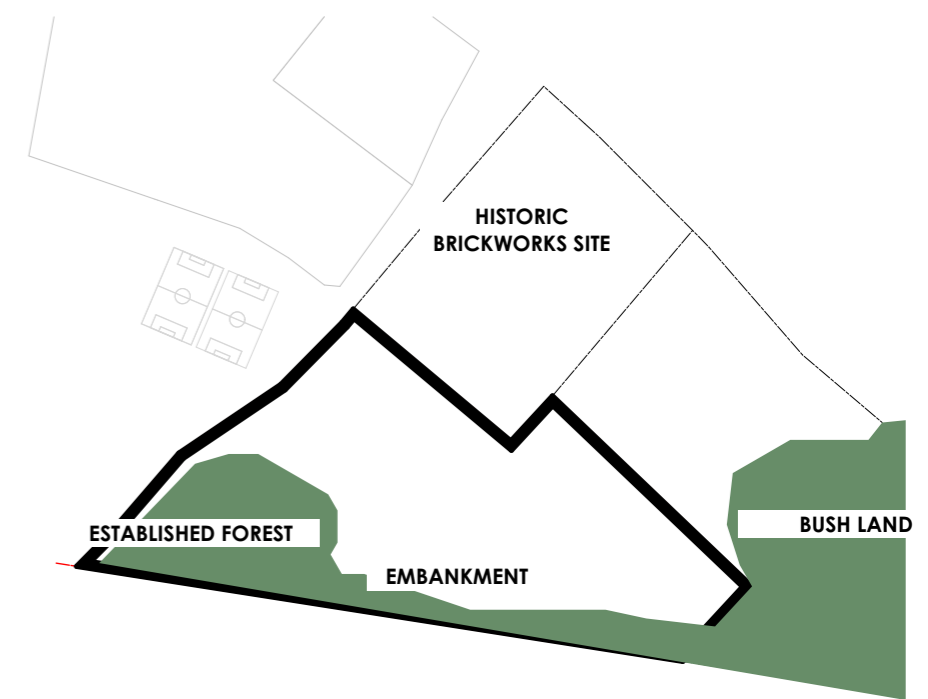
VIEWS

### SITE FEATURES

The primary features of the site are the established Iron Bark forest to the south and the undulation of the site due to the previous mining activity.

An embankment that runs along the southern boundary represents the highest part of the site, whilst the centre and north-eastern parts of the site are low level and contain ponds and wetlands.

The Brickworks site to the north has been extensively mined and is largely devoid of any vegetation or established trees.



SITE FEATURES



# SITE ANALYSIS

## 2-6 ACCESS

### VEHICULAR CONNECTIVITY

Vehicular access to the site is limited to Metford Road which is currently a single carriageway local road. There is no other road access to the site.

The site is effectively bordered by two major arterial roadways being New England Highway to the south and Raymond Terrace Road to the north. These two road links will provide the primary access to the future Hospital from the regional precinct.

Traffic from north of the site will access the proposed Hospital via Raymond Terrace Road. The Raymond Terrace / Metford Road intersection is subject to flooding.

Access for southern traffic coming from Maitland will be via the New England Highway and Chelmsford Drive onto the southern end of Metford Road.

### SITE ENTRY

Analysis of possible access points from Metford Road onto the site have identified the intersection of Metford Road and Fieldsend Street as the most appropriate location for traffic accessing the new Hospital.

A secondary access point for emergency traffic is proposed along Metford Road to the south of Fieldsend Street though requires adequate separation from the main intersection.



# SITE ANALYSIS

## 2-7 INFRASTRUCTURE & SERVICES

Infrastructure services to the site will be accessed primarily from the western side of the site, off Metford Road.

### HV SUPPLY

The site is serviced by two high voltage feeds being a 33kV line running along the southern boundary of the site and an 11kV on the western side of Metford Road running parallel to the site boundary. Capacity of these two HV feeders to supply the future electrical demand of the new Hospital will be further assessed during subsequent design phases.

### SEWER

A sewer line runs through the south-west corner of the site which connects into a pumping station at Morpeth Waste Water Treatment Works. Currently this sewer line is quite shallow which will impact on areas of the Hospital below RL18, primarily any lower ground floor services. The capacity of this line will need to be determined to ascertain if any upgrade is required.

### WATER

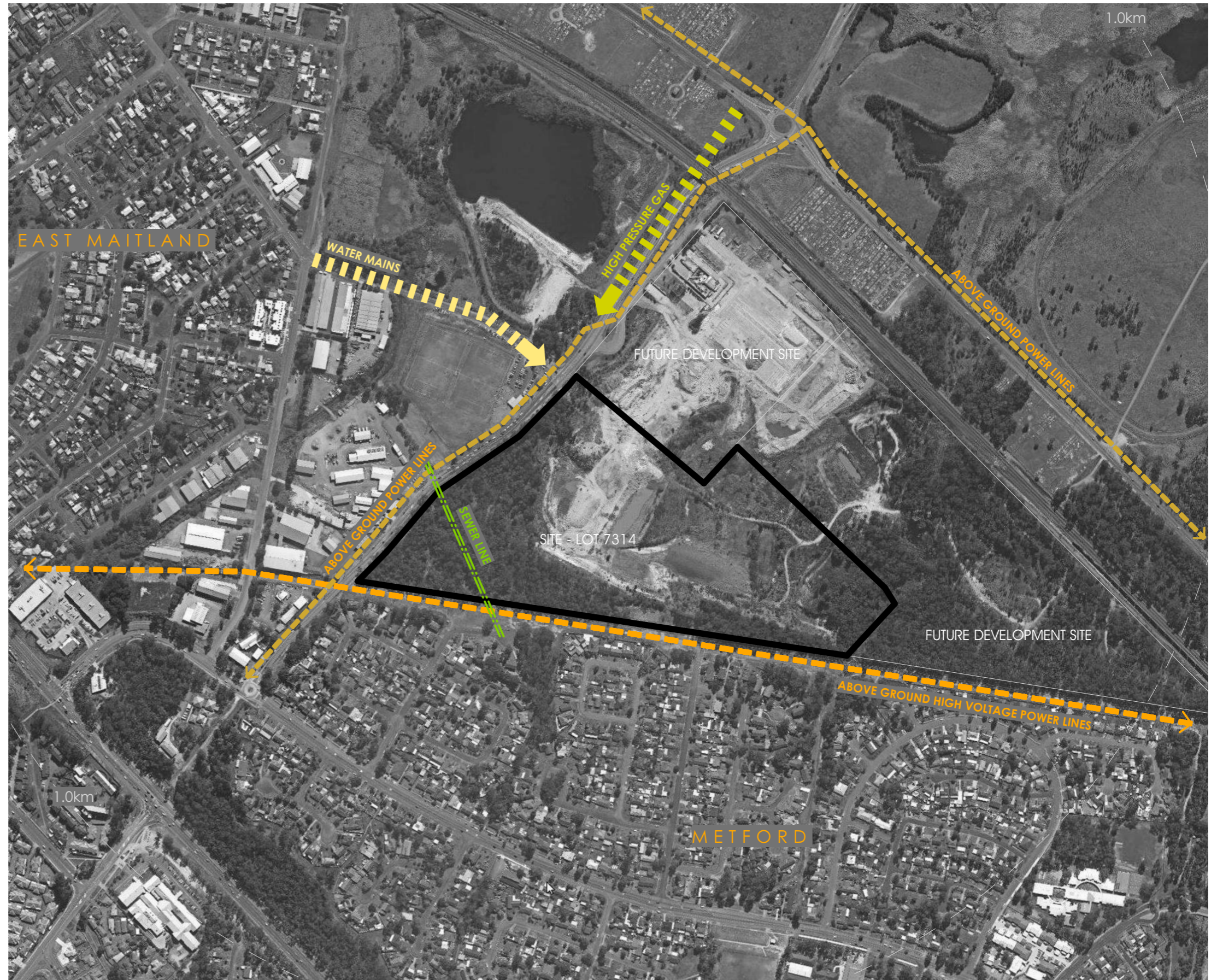
Hunter Water have recently extended a new water main from the existing 500mm diameter main in Turton Street Metford along Fieldsend Street and Metford Road facilitating a direct connection to the new Hospital site. This will provide a second possible water main connection to the future Hospital in addition to the existing 150mm diameter water main.

### GAS

A high pressure line runs from the railway line towards the site along Metford Road. A connection to this service is possible once an appropriate route is established on to the site.

### COMMUNICATIONS & DATA

A fibre optic cable is available to the site, running along Raymond Terrace and Metford Roads. The area has 4G coverage.



# SITE ANALYSIS

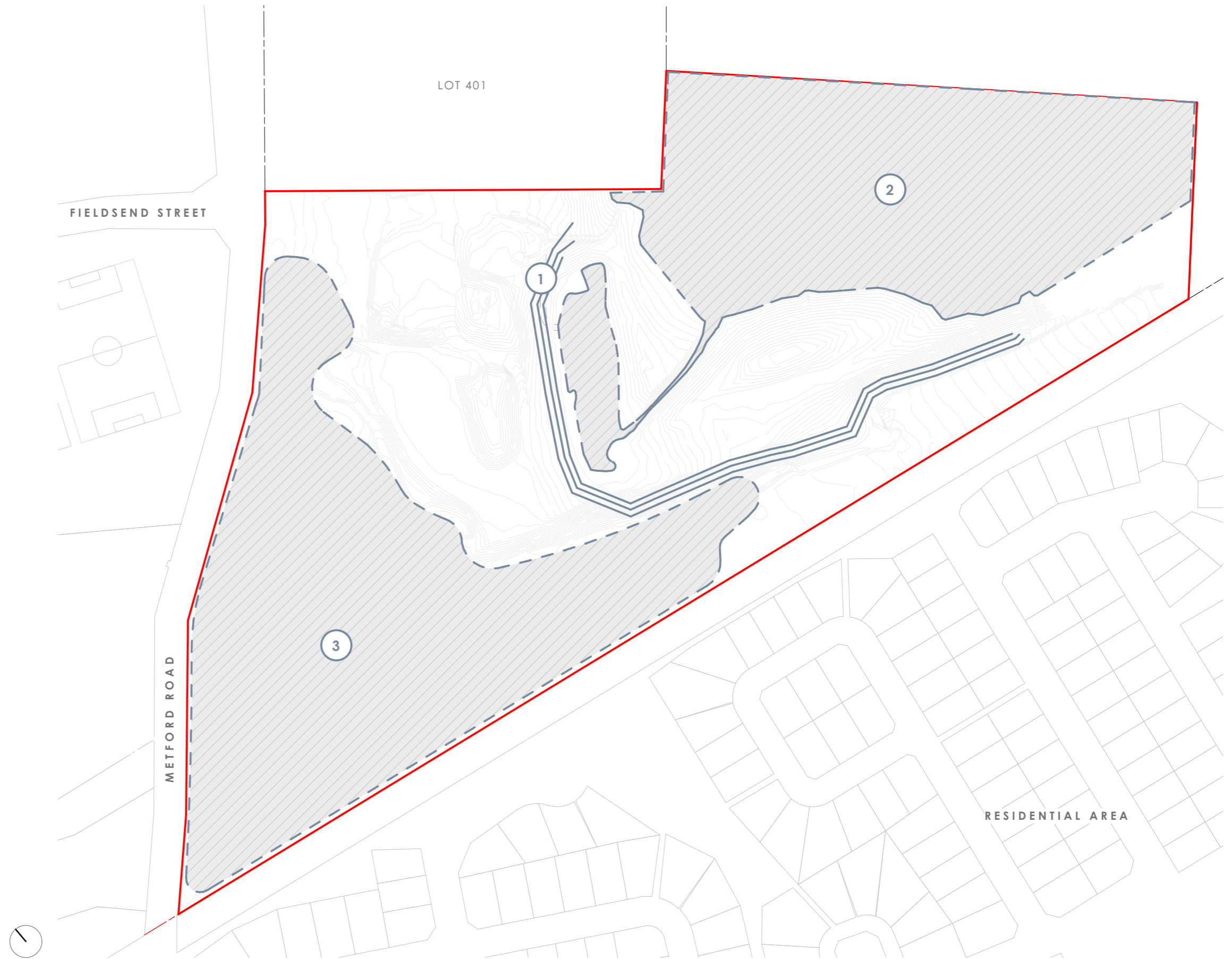
## 2-8 SITE CONSTRAINTS

Three major site constraints have been identified as the predominant drivers for the placement of the Hospital.

These are:

- The varied topography
- Site drainage
- The established ironbark forest

Each is described in further detail on the following pages.



# SITE ANALYSIS

## 2-9 SITE CONSTRAINTS - TOPOGRAPHY

The current topography on the majority of the site is a result of the long-term mining activity carried out over the last 130 years (commercial activity on the site ceased in 2012) .

This mining activity has resulted in significant changes to the natural topography of the site with the majority of the site disturbances evident in the north-east and northern sections of the site.

The previous CSR site, Lot 401, displays the greatest degree of disturbance as this area was the site of the previous brick manufacturing activity while a high degree of quarrying was carried out on the proposed Hospital site, Lot 7314.

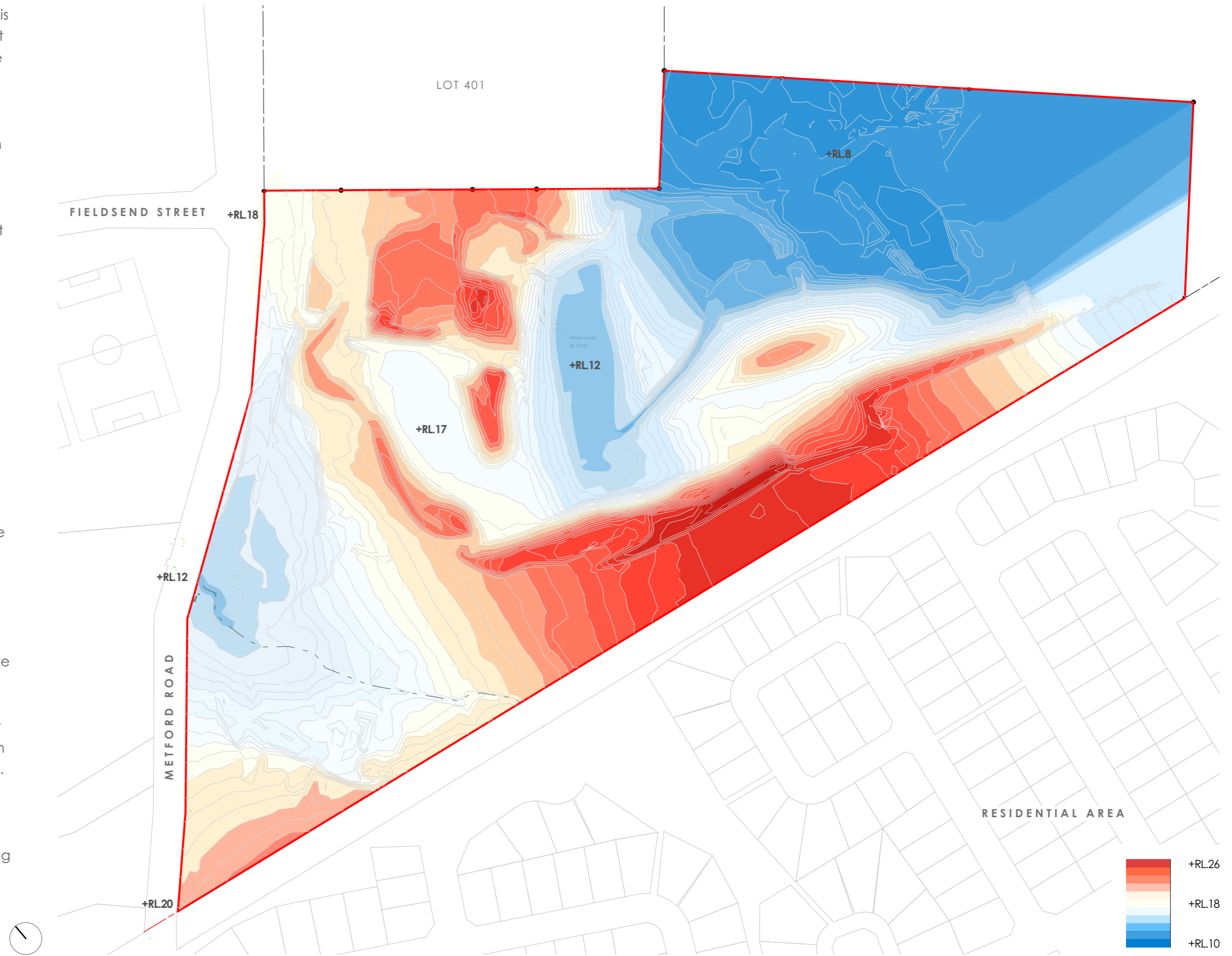
Natural landforms in the remainder of the site are distinct and comprising of undisturbed natural bushland to the southern corner of the site and a narrow corridor of native vegetation along the eastern boundary adjacent to Metford Road.

The remainder of the site consists of exposed clay formations varying in height that are a result of previous quarrying and remediation activity on the site.

The resultant site levels vary from RL10 to RL26. The lower sections of the site which were subject to deeper quarrying have formed water detention zones and over time these areas have taken on the characteristics of wetland environs.

CSR are currently working with the State and other key stakeholders to implement a mine closure plan and continues to carry out remediation on Lot 401.

The subject site has been cleared of industrial activity based contamination and the majority of the work on the site is centred on removal of mining spoil and adjusting the site levels to align with the required platform for the future Hospital.



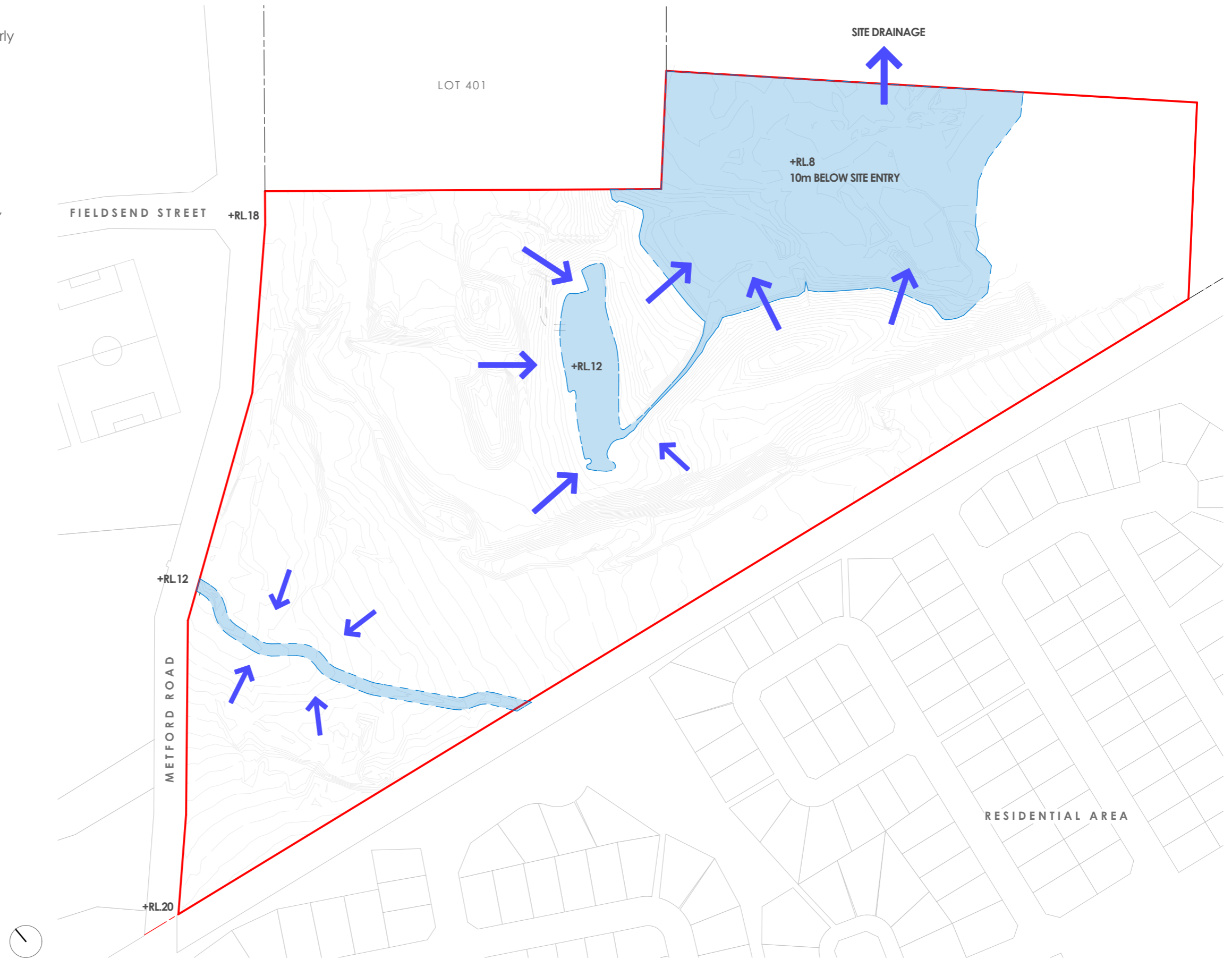
# SITE ANALYSIS

## 2-10 SITE CONSTRAINTS - DRAINAGE

The site accommodates two primary drainage channels to the east of the site running in a northerly direction and the south-western corner of the site draining to Metford Road to the west.

Both these channels originate from the Metford residential zone to the south of the site.

The south-western drainage channel is subject to approval under the Water Management Act 2000, and approval is required from the NSW Office of Water for any works to be carried out within a 40 metre zone of the channel.



# SITE ANALYSIS

## 2-11 SITE CONSTRAINTS - IRON BARK FOREST

The site contains an undisturbed natural bushland of approx 1Ha in the south-west corner of the site. Predominant species are Iron Bark, Forest Red Gum and Rough-Barked Apple trees in addition to spotted gums.

The quarrying activity has cleared most of the site of its natural vegetation resulting in extensive fragmentation of the original woodlands.

The Spotted Gum Ironbark Forest in the south-west corner of the site and running along the southern boundary as a narrow corridor is part of the original forest covering the site.

The value of this natural bushland is significant.

Firstly, it is an intrinsic character of the site reflecting its former grandeur.

Secondly, it is a natural buffer between the existing residential development to the south of the site. Thirdly, it is an important habitat and travel corridor for native fauna.

A secondary vestige of the native bushland of the site exists as a narrow corridor along the western boundary of the site along Metford Road, which effectively screens the site from the roadway and would be maintained where possible to reduce the impact of the new development from the western precincts.

This forest does pose a fire risk to any development on the site so will need to be carefully considered.

Current guidelines requirements stipulate that Special Fire Protection Purposes development, i.e Hospitals, establish an Asset Protection Zone (APZ) between the built infrastructure and the bushfire source feature. Based on current guidelines the APZ for southern sector of the site is 70 metres.



# SITE ANALYSIS

2-12 PHOTOGRAPHIC RECORD



MAIN ENTRY - View from Metford Road looking south-east



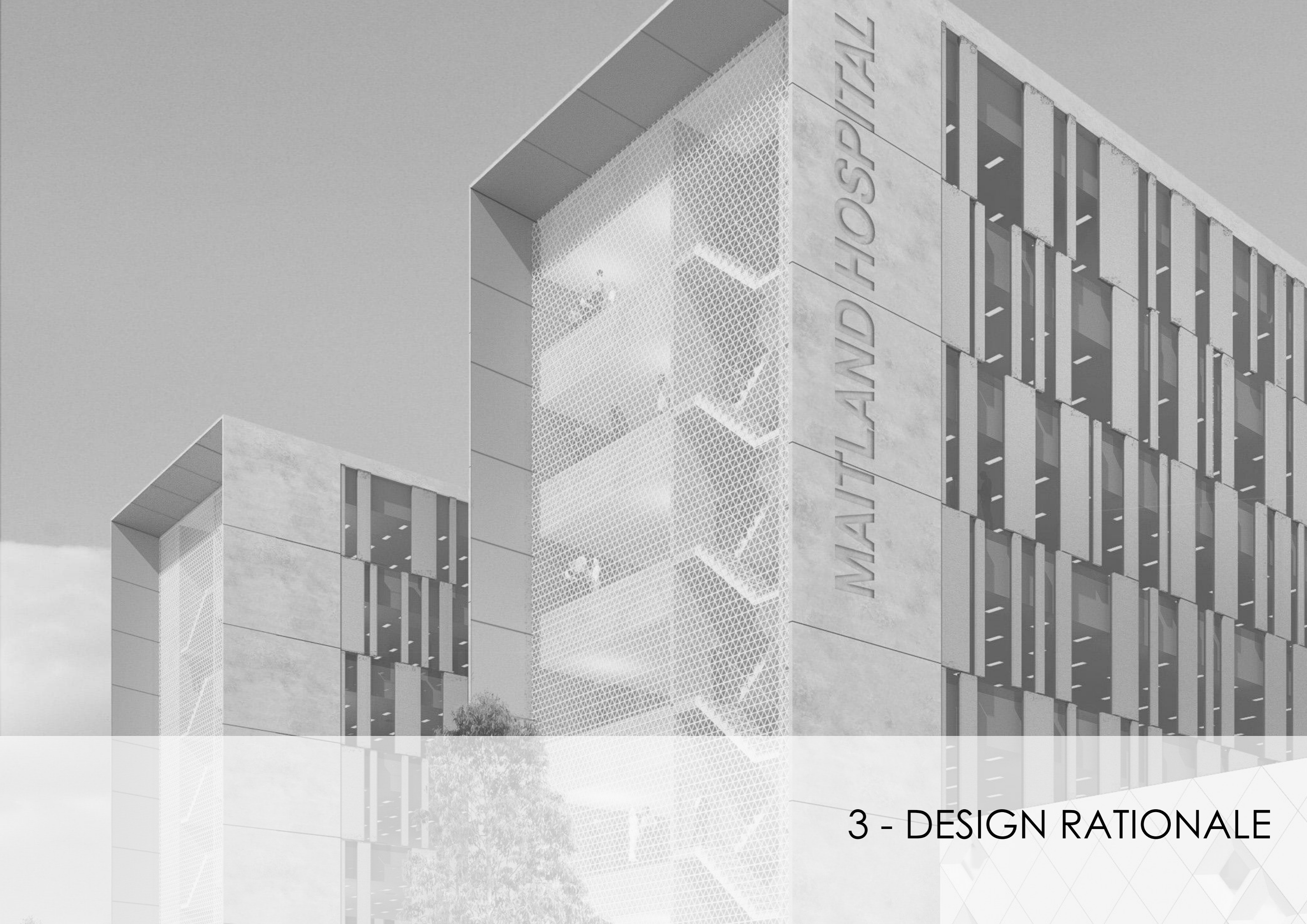
SECONDARY ENTRY - View from Metford Road looking north



APPROACH - View from Metford Road looking north



RESIDENTIAL AREA - View from Ausgrid corridor looking north-west



### 3 - DESIGN RATIONALE

# DESIGN RATIONALE

## 3-1 THE SITE

### HOSPITAL ZONE

The location for a building zone is limited to land free of site constraints and manageable topography.

Site analysis has identified a rationalised zone on the west of the site which is suitable for immediate development for the New Maitland Hospital.

This building zone is adjacent to the Metford Road boundary of the site and has an average level of RL18 varying by 1-2 metres.

This level corresponds to the approximate level of the intersection of Metford Road and Fieldsend Street.

### SITE ACCESS

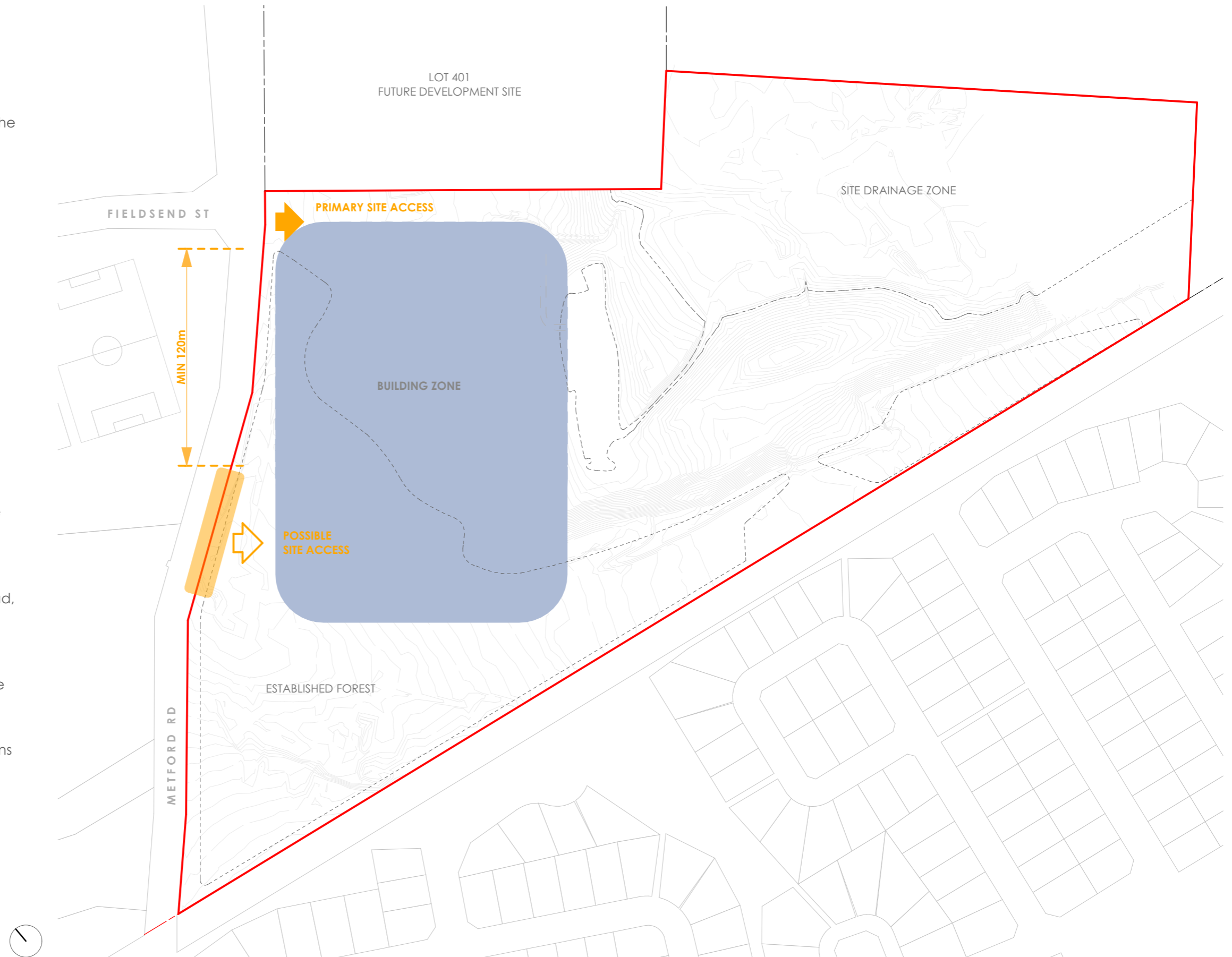
Vehicular access to the site is only possible along Metford Road.

Traffic engineering analysis provided strong recommendation for the primary site access to be located at the Metford Road / Fieldsend Street intersection.

A secondary access is possible along Metford Road, provided there is a minimum of 120m separation between the two entrances.

A secondary entrance is recommended to reduce traffic congestion.

This strategy is consistent with the recommendations of the traffic engineering report.



# DESIGN RATIONALE

## 3-2 PODIUM FOOTPRINT RATIONALE

### SOA

The total gross building area scheduled for the New Maitland Hospital is 46,232m<sup>2</sup> (excluding car park facilities and road network).

For functionality and site efficiency, this area will be split across multiple levels in either a large podium, low-rise configuration or a compact podium, high-rise configuration.

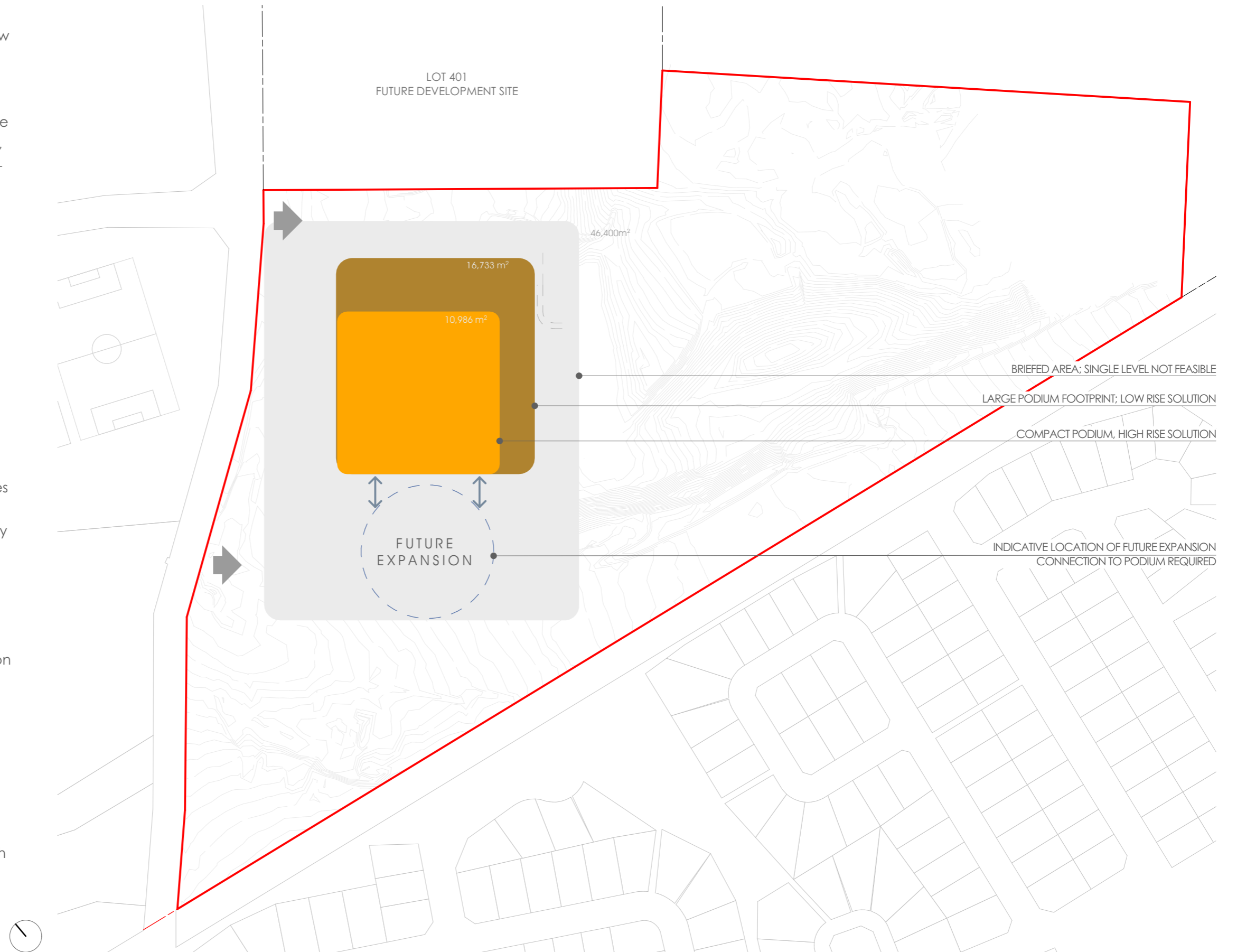
### BUILDING COST

Due to the challenges of site constraints and cost implications of extensive civil works, a condensed hospital footprint and site roadwork strategy is proposed as the most cost efficient building configuration.

### KEY DRIVERS

Key design rationale drivers for the hospital are:

- Achieving optimal clinical adjacencies & linkages
- Ensuring a high level of Ground Level functionality and way-finding
- Addressing the impact of vehicular access and required parking
- Minimising the impact of the proposed Hospital on surrounding residential precincts
- Mitigating existing site constraints
- Consideration for the future development opportunities of the site and adjacent future development sites
- An 8.4m structural grid consistent with NSW Health Design Guidelines



# DESIGN RATIONALE

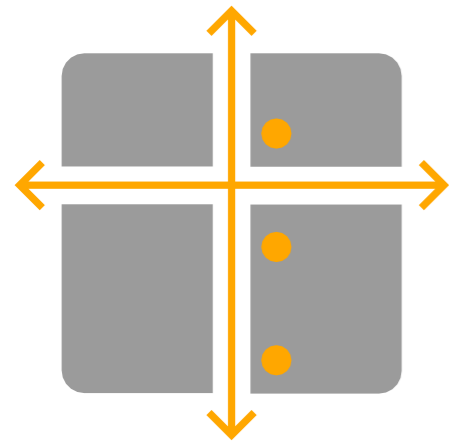
## 3-3 HOSPITAL PODIUM DESIGN

Design of the Ground Floor podium is critical for the hospital's development and connected infrastructure. Once defined, all other parameters are able to evolve.

The Ground Floor podium design has been rigorously explored to ensure efficiencies in functionality, public connectivity and building cost.

Key design evolutions are demonstrated below, resulting in the preferred podium design, Option 5.

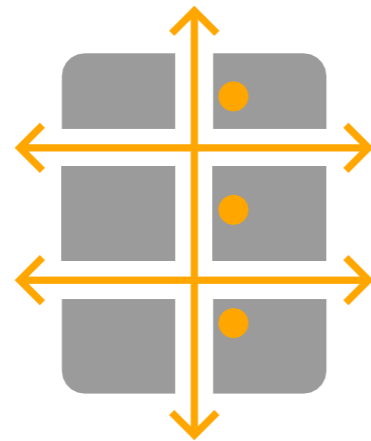
1.



- 17,000m<sup>2</sup>
- 15 grid x 16 grid square format

- 2 major circulation streets
- 3 lift cores connected off public street
- large circulation distances
- multiple connection opportunities to car parking facilities
- clear wayfinding
- multiple tower layout options

2.



- 14,500m<sup>2</sup>
- 13 grid x 16 grid rectangular format

- 3 major circulation streets
- 3 lift cores connected off public street
- increased circulation to provide good public flow
- Clinical function and connection compromised
- multiple public entrances, no hierarchy

3.



- 14,500m<sup>2</sup>
- 13 grid x 16 grid rectangular format

- 3 major circulation streets
- north/south corridor terminated halfway
- 3 lift cores; 2 public, 1 clinical
- circulation reduced, providing increased clinical area and connectivity
- multiple public entrances, no hierarchy

4.



- 11,500m<sup>2</sup>
- 13 grid x 13 grid square format

- GF functions reduced with non-critical functions moved into tower, taller tower solution
- 2 major circulation streets maintained
- north/south corridor terminated halfway
- 2 lift cores
- number of public entrances reduced, west and north entrances prioritised

5. (Preferred Option)



- 10,980m<sup>2</sup>
- 10 grid x 16 grid rectangular format

- 2 major circulation streets maintained
- lift core reduced to one centralised zone for efficiency in GF and towers

# DESIGN RATIONALE

## 3-4 GROUND FLOOR FUNCTION & ED LOCATION

### REQUIRED GROUND FLOOR FUNCTIONALITY

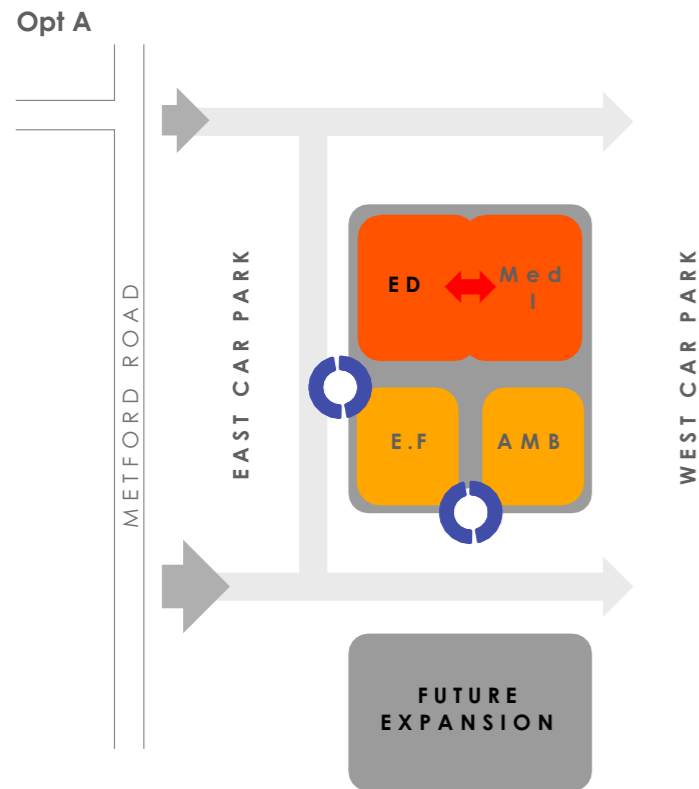
The following are the key design drivers to ensure Ground Floor functionality:

- Emergency Department; separate public and ambulance entries
- Medical Imaging; direct link to ED
- Entrance Functions
- Ambulatory Care Clinics
- Future expansion connectivity

### ED LOCATION KEY REQUIREMENTS

The following are the key requirements for the Emergency Department:

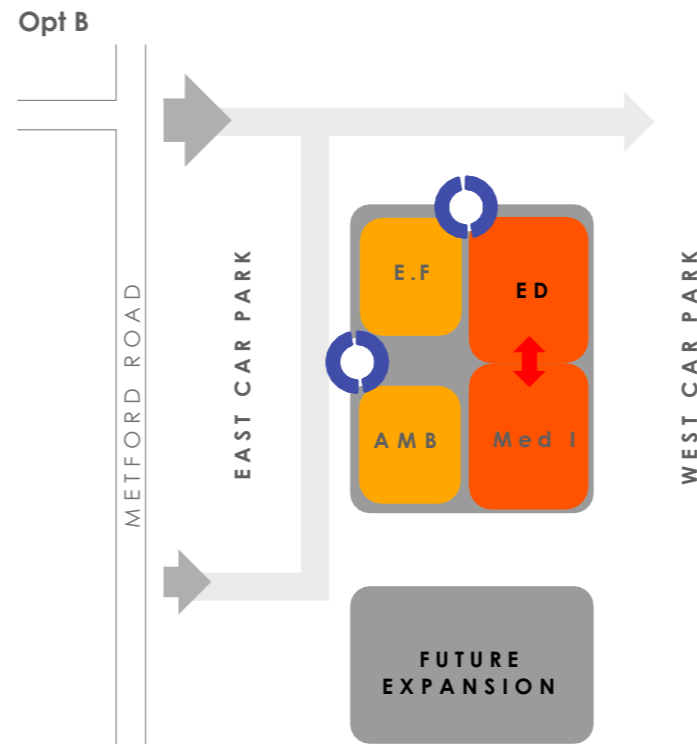
- logical relationship between ED and other clinical zones
- logical public and clinical access
- clear and easy public wayfinding and entry locations



This option ideally locates the primary public entry halfway along Metford Rd which is not consistent with the current traffic advice.

There is potential for the primary public entry to be located at the intersection of Metford Rd / Fieldsend St however this will likely cause a high degree of congestion along the northern hospital road directly in front of ED.

There is no direct connectivity between ED and the preferred future expansion location.

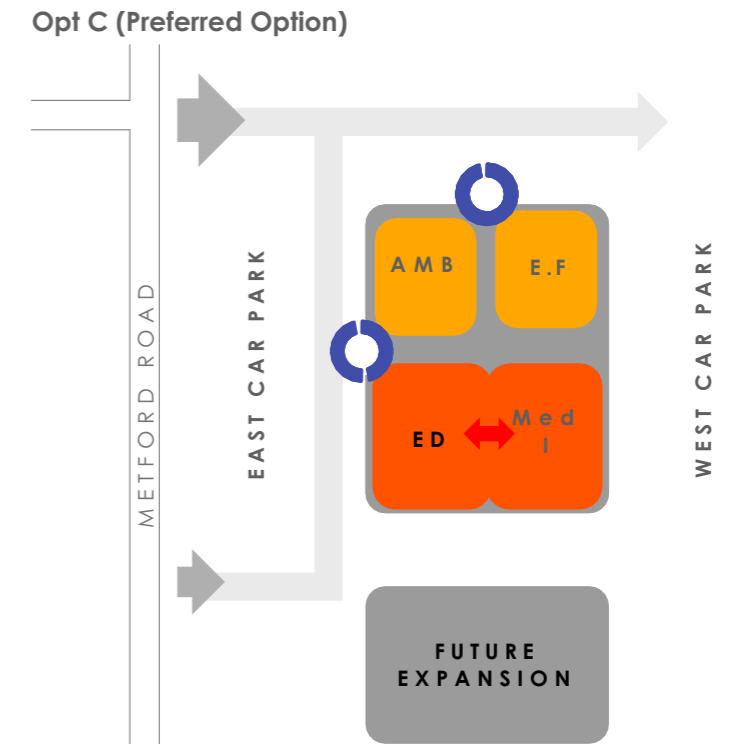


This option results in large travel distances from the secondary entry point to ED for ambulance traffic.

There is potential for high congestion along the northern hospital road impeding access to ED.

A high volume of traffic traversing in front of the Entry Functions and AMB may impede pedestrians crossing from the East Car Park.

There is no direct connectivity between ED and the preferred future expansion location.



This option allows for the primary public entry at the Metford Rd / Fieldsend St intersection and quickly separates ED traffic from the general public, staff and BOH traffic.

The secondary entry provides short and dedicated access for ambulances to ED.

There is good connectivity from future expansion location to ED.

# DESIGN RATIONALE

## 3-5 PODIUM SITING

The preferred podium option has a footprint of 10,986m<sup>2</sup>, sitting well within the nominated building zone.

The relatively compact size of the podium minimises earth-works and allows flexibility in:

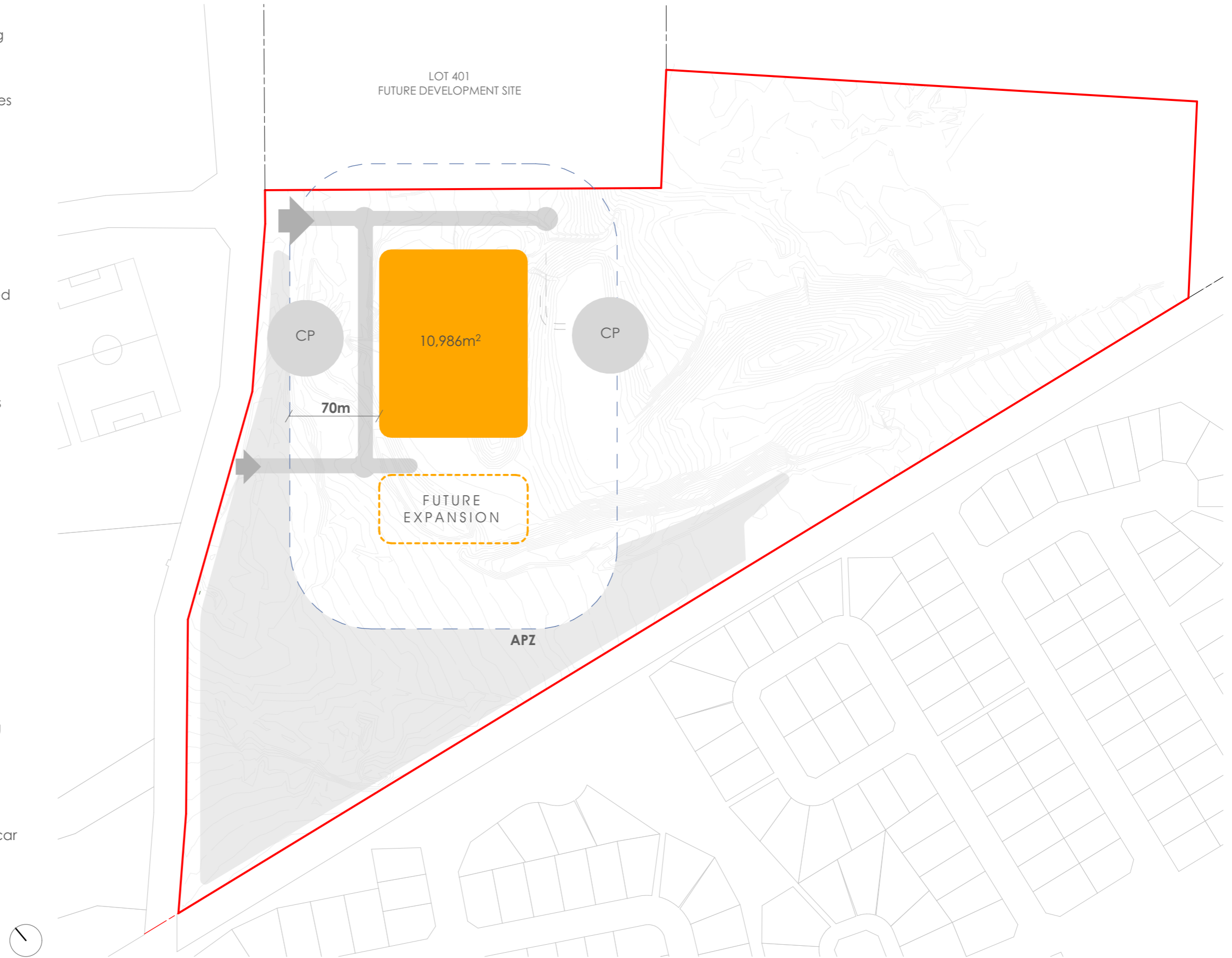
- siting
- hospital expansion
- vehicular circulation
- connectivity to ground level infrastructure

Various options for the siting of the Hospital within the nominated building zone have been evaluated with the key drivers being:

- building influence area
- existing site levels and required site works
- use of topography to access basement functions
- functionality of hospital
- future site development connectivity and space for expansion
- adequate space to the north and west of the hospital to facilitate a logical road network and car parking strategy
- proximity to secondary vehicle entrance
- mitigating site constraints
- minimal impact on established forest and incorporation of an APZ

The preferred podium position within the building zone adopted for the reference design provides:

- vehicle movement / drop off opportunities along north and west facades
- minimal reduction in established forest
- dedicated entry for emergency vehicles
- car parking opportunities to east and west of site
- opportunity to utilise natural site topography for car parking / basement access



# DESIGN RATIONALE

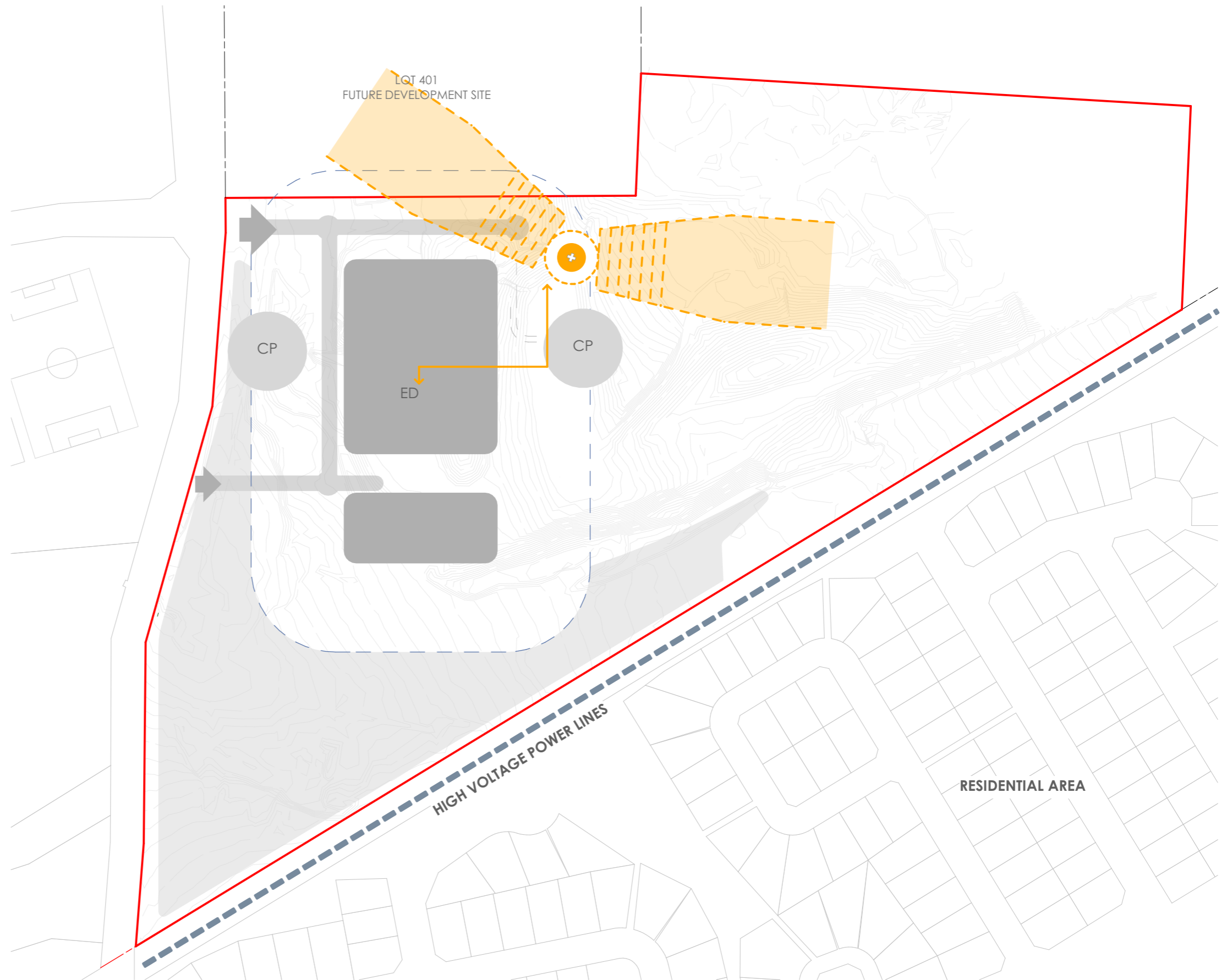
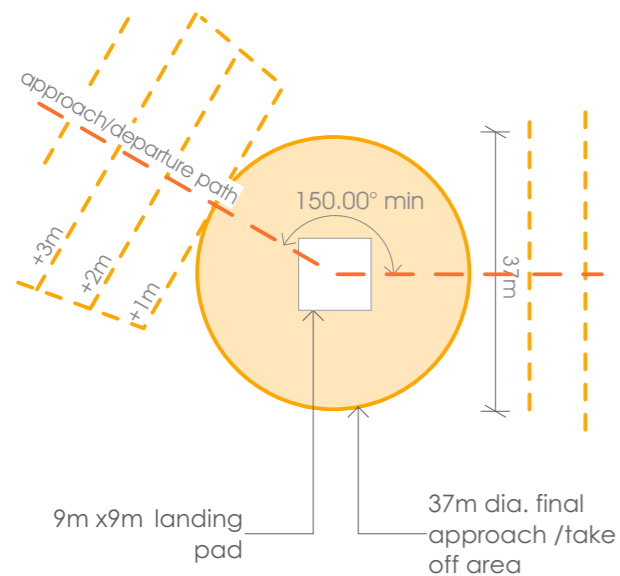
## 3-6 HELIPAD LOCATION

An aviation study has been conducted to assist with the placement of the helipad on the site. As part of this study, the following constraints were identified:

- A safe and elevated landing area
- The distance from the residential area to the south to minimise acoustic impact
- Restrictions on the flight path ensuring it is free of existing power lines, trees, the proposed Hospital building and future development opportunities
- The flight path is to have a min of 150degree between take off cone paths
- The flight landing pad is to have a minimum 9m x 9m landing zone within a minimum 37m dia final approach and take-off area

The preferred helipad location to mitigate these constraints is to the north-east of the podium, attached to the eastern car park. Its location allows a link to ED via a dedicated path on perimeter of car park or via ambulance transfer.

Proximity to surrounding infrastructure will need to be carefully planned to ensure compliance is achieved.



# DESIGN RATIONALE

## 3-7 IPU ORIENTATION

A number of factors were assessed to determine the optimal orientation for the IPU towers above the Hospital podium.

Option B was adopted for the reference design due to the following:

### SUN & SOLAR LOADING

The podium and building grid is oriented at approx 45 deg to north, hence there is no significant preference for IPU orientation in relation to solar loading.

Consideration of external shading devices, glazing configuration and performance will be required to ensure the overall facade system is an efficient and sustainable outcome.

### VIEW OPPORTUNITIES

The optimal views from the towers at mid and high level are east towards the regenerated bushland and north-west over Metford Road towards Fieldsend Oval.

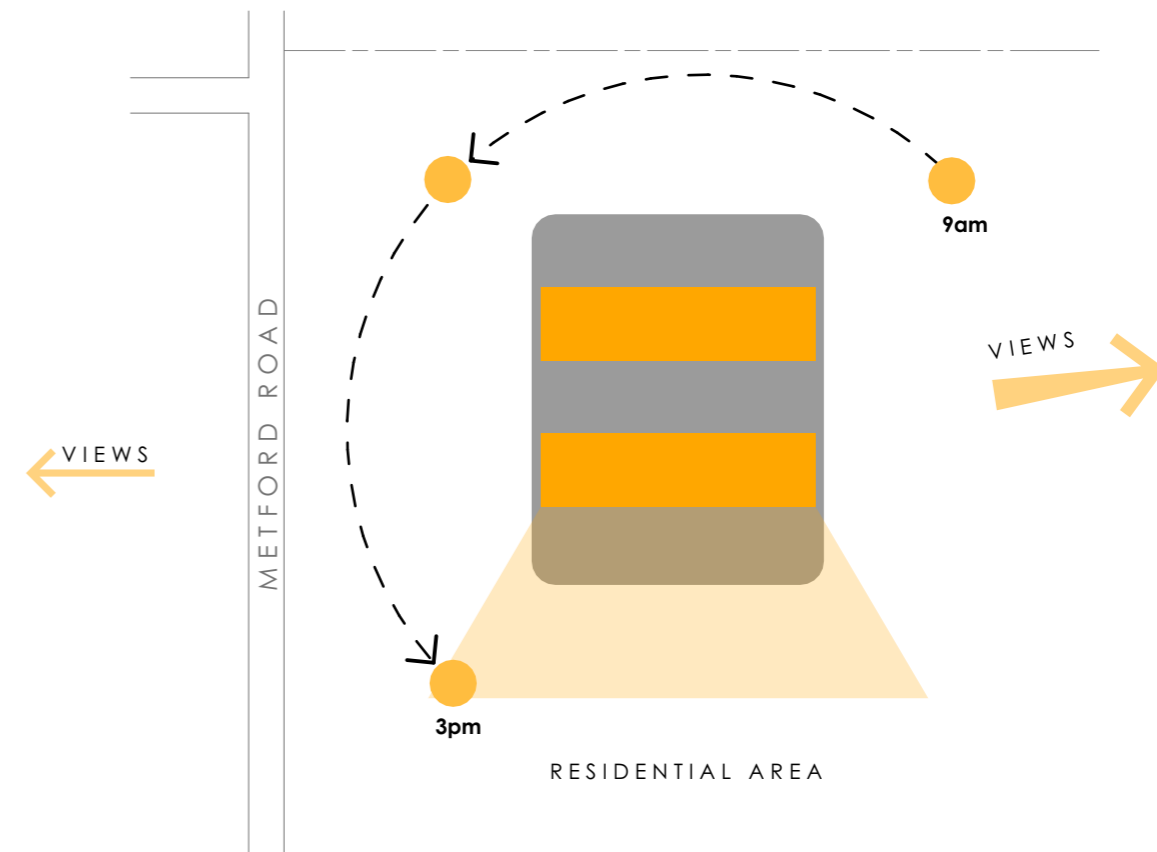
IPUs orientated north-south are able to utilise these views and enhance the patient experience, hence option B is preferred.

### OVERLOOKING

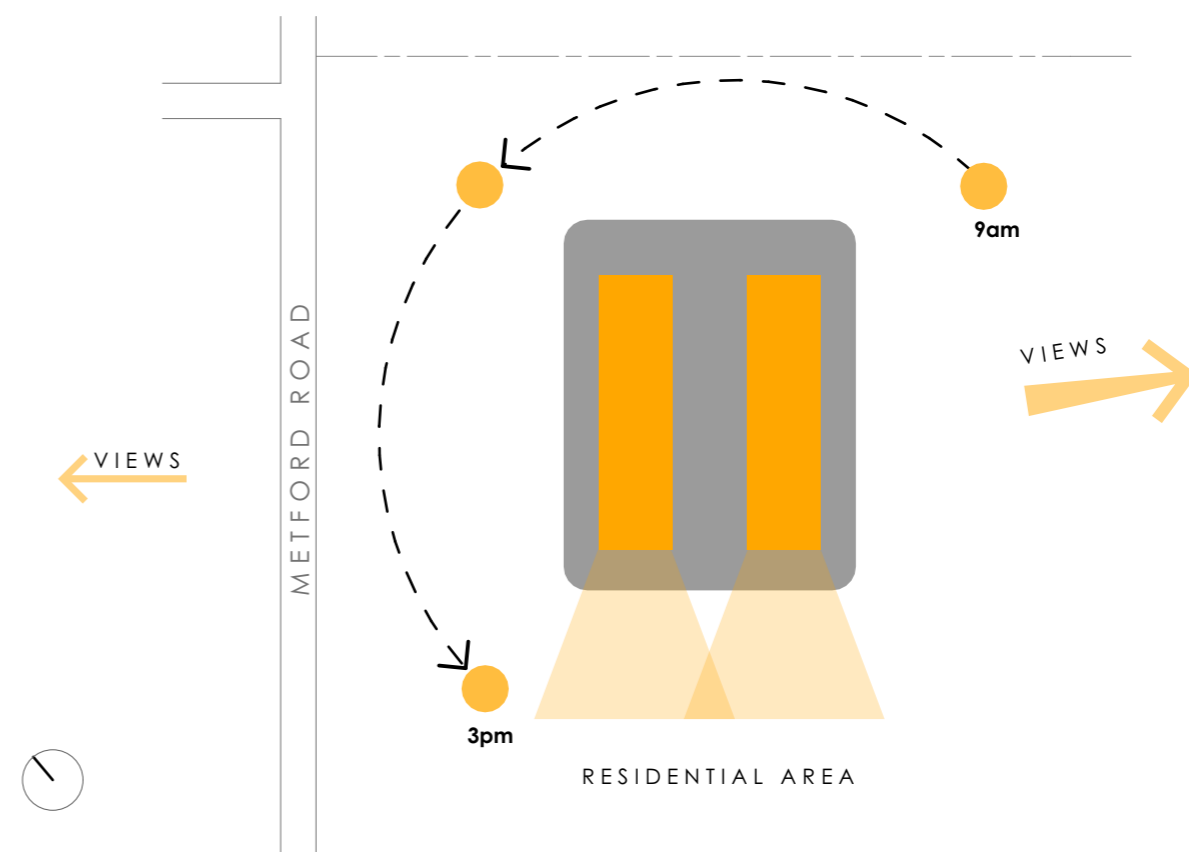
The area where overlooking should be avoided is the residential properties to the south.

IPUs orientated north-south direct the long facade of the tower away from this sensitive area minimising overlooking, hence Option B is preferred.

Option A - 'East-west' orientation



Option B - 'North-south' orientation



# DESIGN RATIONALE

## 3-8 FUTURE FLEXIBILITY & EXPANSION

A key aspect of the planning of the Maitland Hospital has been the incorporation of flexibility within the design for future expansion.

This ensures the design has the ability to meet future demands relating to advances in medical treatment and changes to the Hospital's catchment demographics requiring modifications to its various models of care and in turn requirements for changes in the physical planning of the operation Hospital.

This flexibility in design has been incorporated in two primary ways.

- The planning of "soft space" departments alongside other units that have traditionally experienced expansion
- "Hard Expansion" or the development of a building design that has key juxtapositions of space and structure to allow expansion beyond the current building fabric

### SOFT EXPANSION

#### Lower Ground Floor

There is the ability to expand the CSSD into the secondary areas of the back of house department in response to a larger sterilising capacity required due to expansion of surgical services..

The Pharmacy Unit can be expanded into the Medical Records unit in response to expansion of chemo services or other units requiring a higher degree of onsite pharmaceutical manufacturing capacity. As electronic medical records take on a greater role in patient management the need for physical records will diminish while archival physical records will be able to be stored off site of ultimately these will be scanned and stored digitally

It is also possible to provide excavated "unbuilt" area into the lower ground floor to accommodate future expansion and possible relocation of hospital functions to this part of the building.

#### Ground Floor

"Soft space" has been planned on the ground floor of the building in the form of retail and spiritual care which total approximately 1000 m<sup>2</sup> in area which can be either reduced in size, relocated to upper floors, or accommodated in physical expansion of the ground floor beyond the current building fabric.

This will allow adjoining departments to expand, primarily medical imaging medicine in addition to ambulatory care and allied health departments to meet future medical treatment capacity.

#### Level 1

Expansion of clinical departments, specifically ICU or future theatre related expansion into the Office Directorates and Staff Amenities units with these two departments relocated to possible standalone buildings elsewhere on the campus.

#### HARD EXPANSION

The building has been planned around an 8.4 metre grid providing a high degree of flexibility in planning future departments.

The building has the ability to expand horizontally beyond the current building fabric on the ground floor of the building to the east to the adjacent car park providing up to 3000 m<sup>2</sup> of additional functional area and to the south for another approx. 4000m<sup>2</sup>.

On Level 1 expansion is achievable on both the east over the proposed car parking zones and to the south allowing the operating theatres and post operative areas to expand substantially.

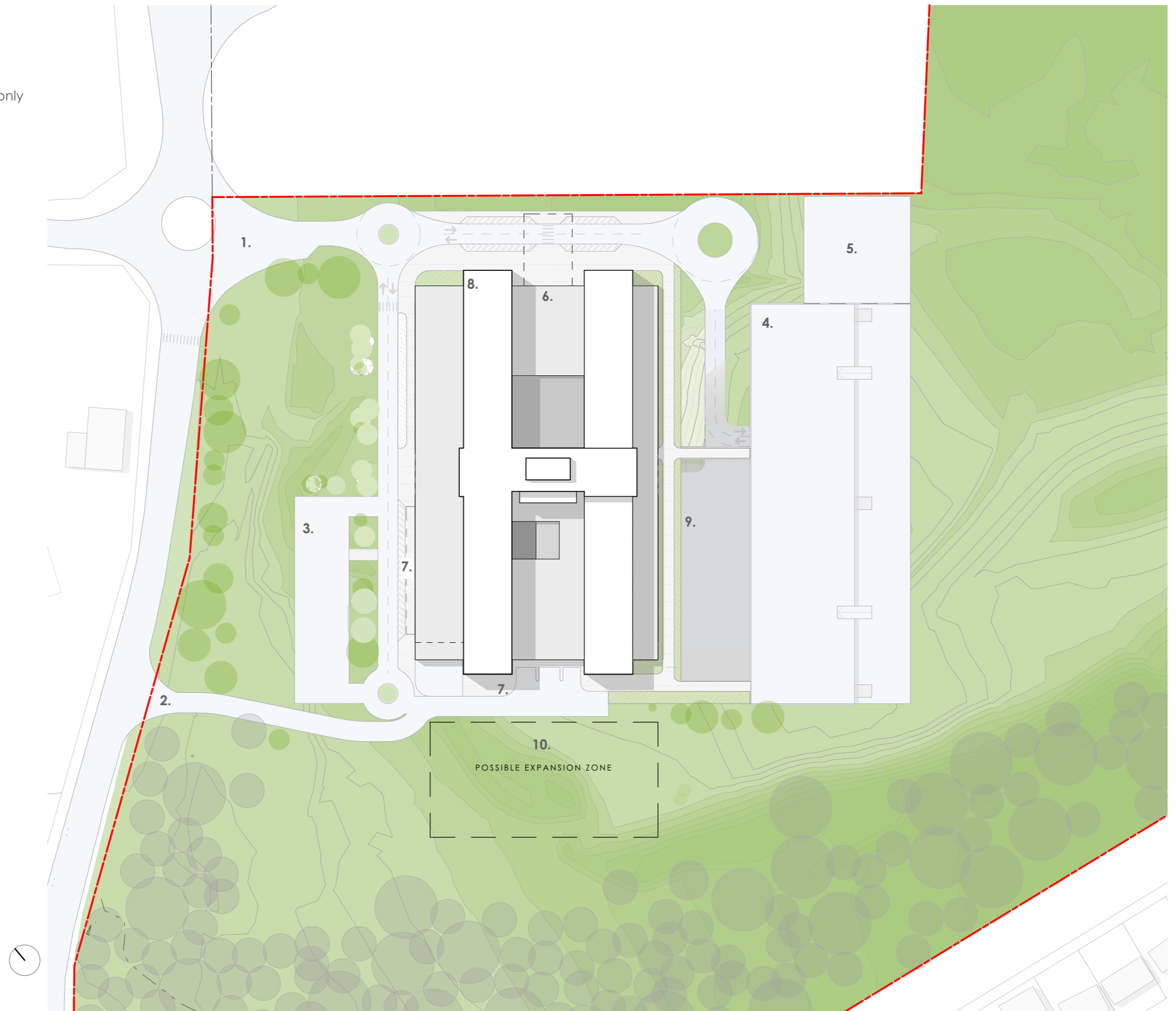


4 - MASTER PLAN

# MASTER PLAN

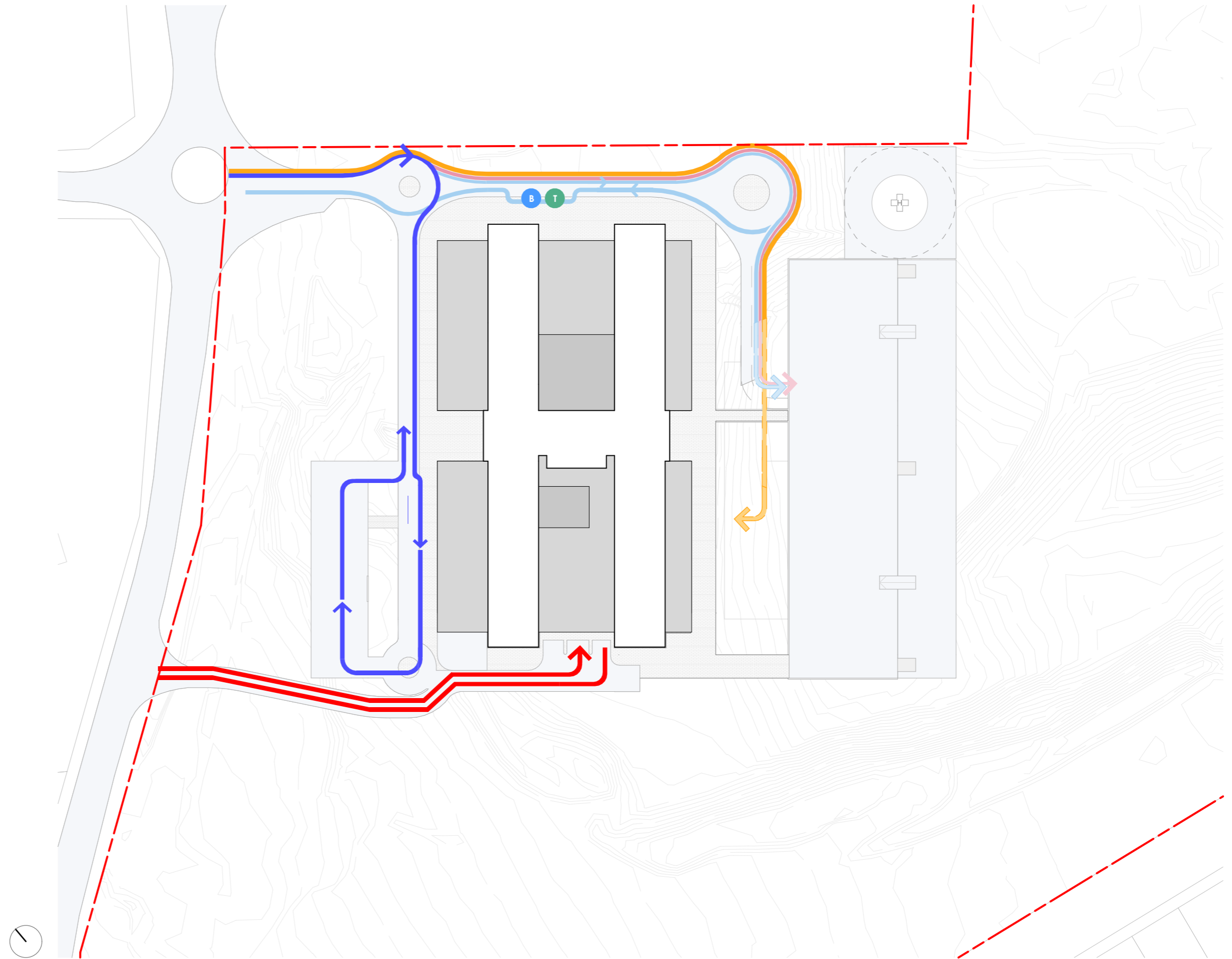
## 4-1 MASTER SITE PLAN






1. Main site entrance and loading dock entry
2. Secondary site entrance - emergency vehicles only
3. West car park
4. East car park; multi level split deck
5. Helipad
6. Main entrance
7. Emergency entrance
8. IPU wards
9. Loading Dock
10. Future Expansion



# MASTER PLAN

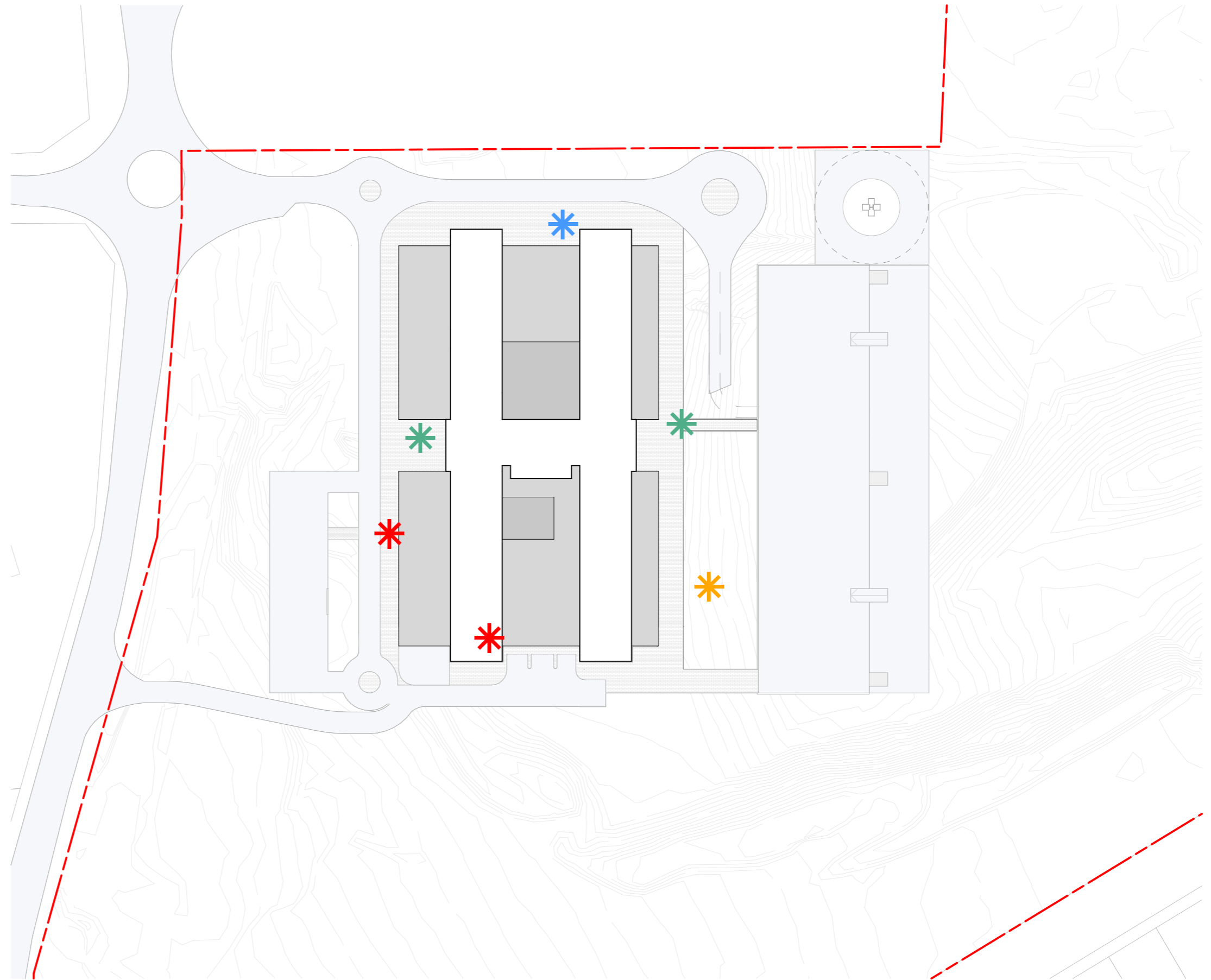
## 4-2 VEHICULAR CIRCULATION







- 1.  Ambulance
- 2.  Staff
- 3.  Public Emergency Drop-off
- 4.  Public
- 5.  Loading/Back of House
- B Bus Stop
- T Taxi rank

# MASTER PLAN

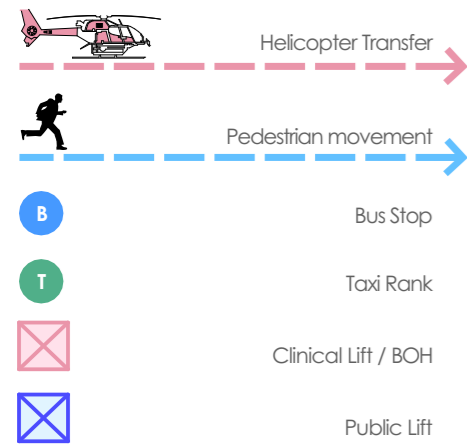
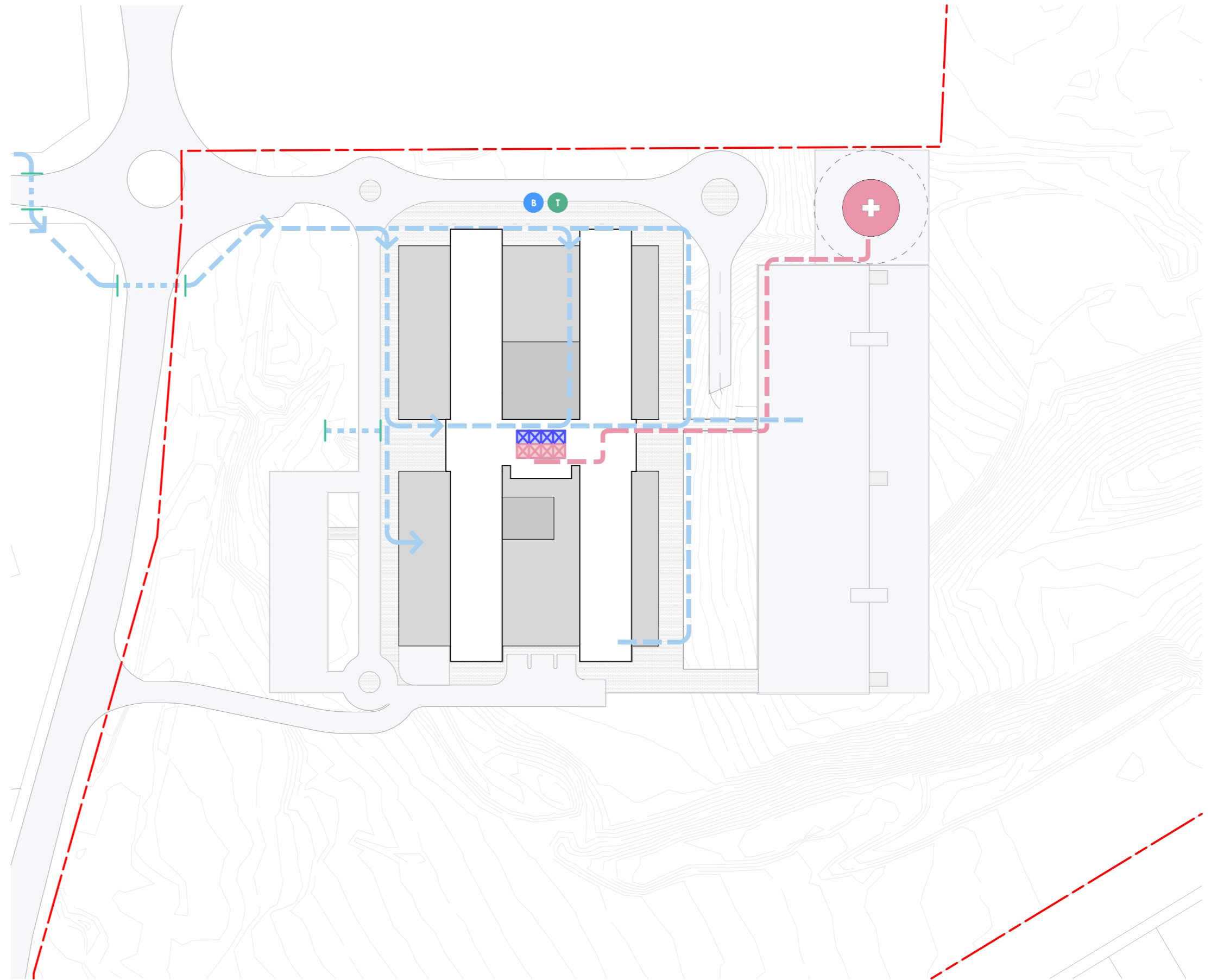
4-3 GROUND LEVEL ENTRY POINTS



-  Main Entrance
-  Secondary Entrance
-  Emergency Entrance
-  Back of House Entrance (Lower Ground Floor)

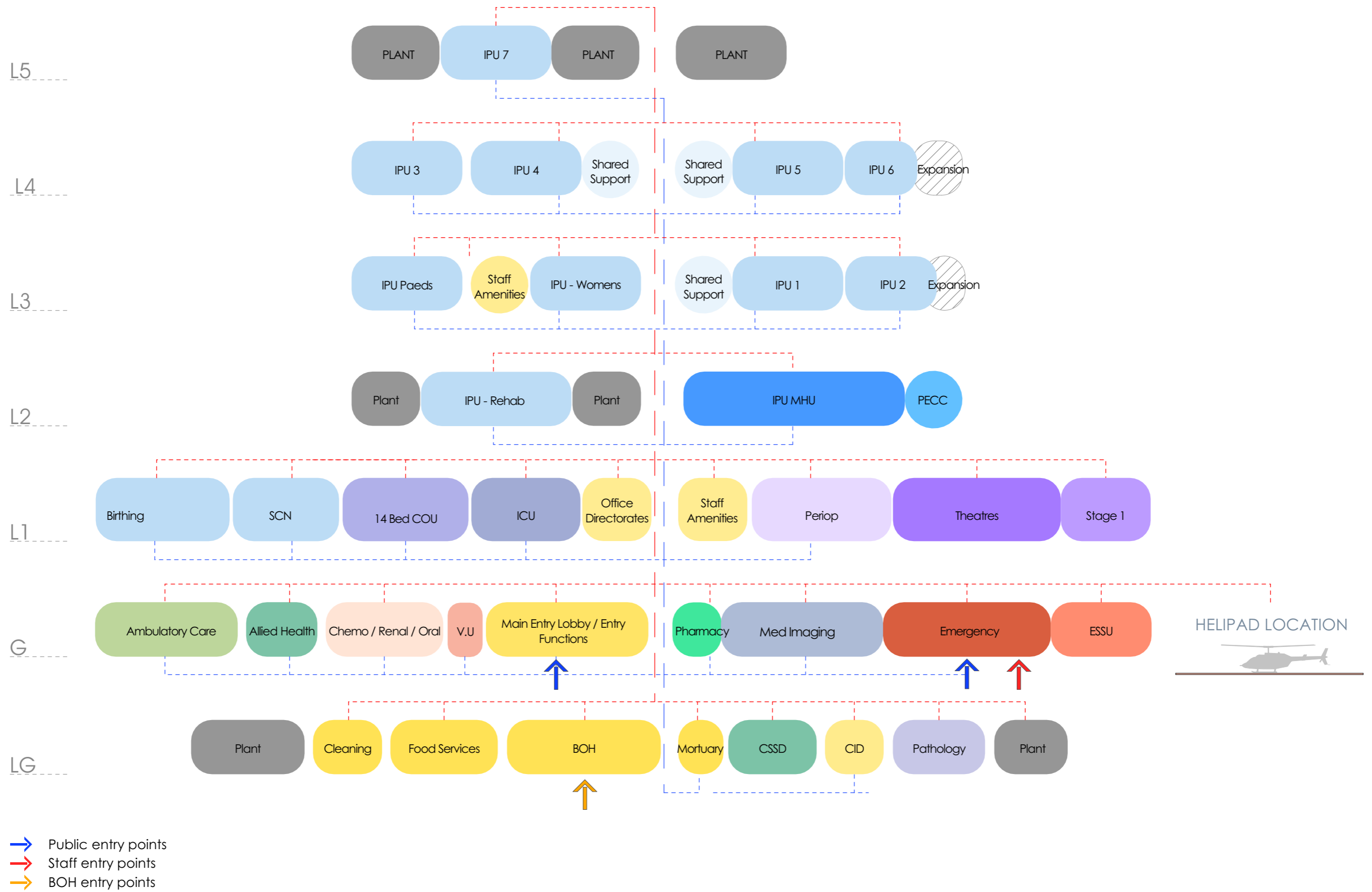
# MASTER PLAN

4-4 PEDESTRIAN CIRCULATION



# MASTER PLAN

4-5 VERTICAL STACKING





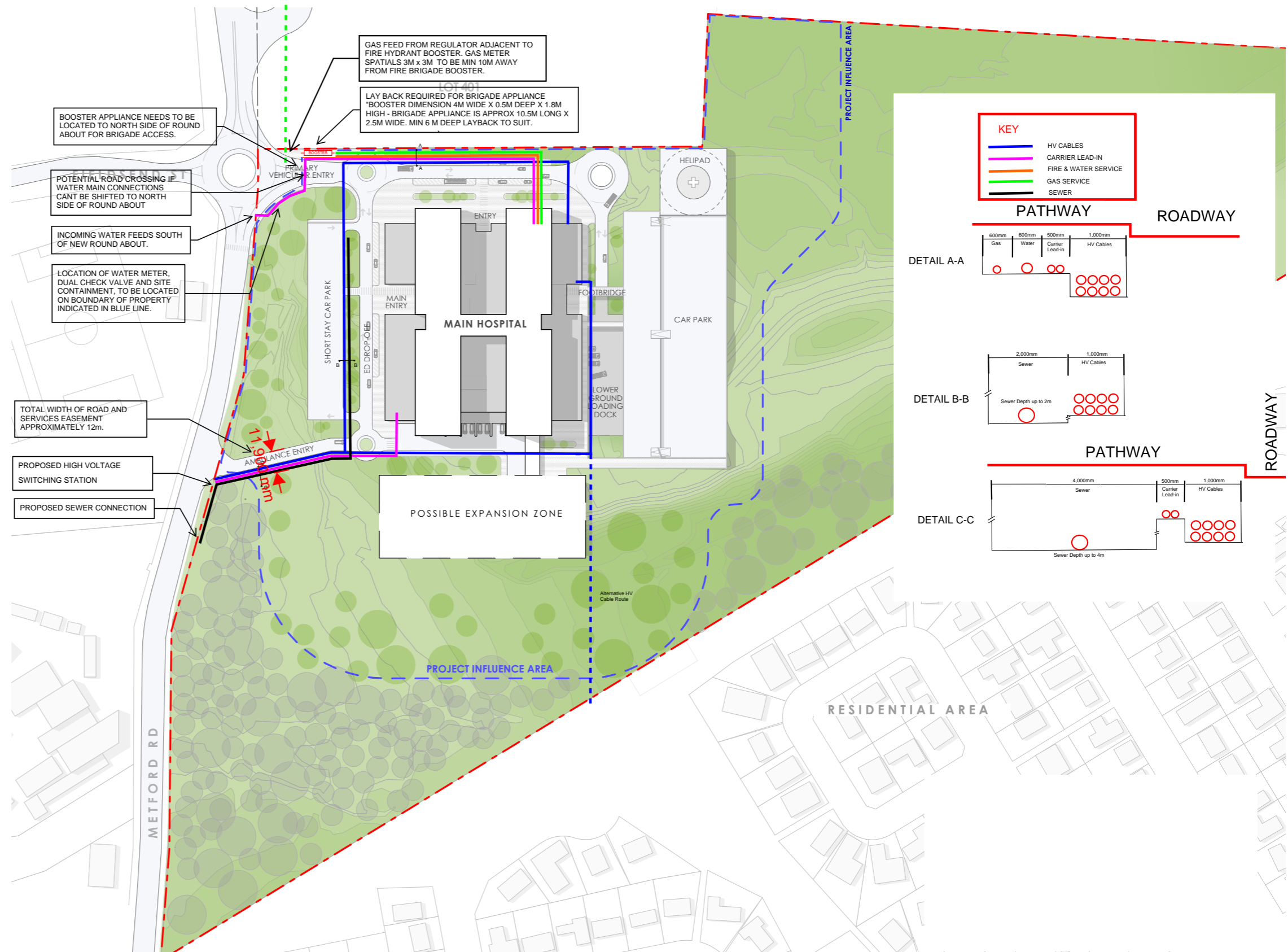
## 6 - INFRASTRUCTURE OVERVIEW

# ENGINEERING SERVICES

## 6-1 ENGINEERING OVERVIEW

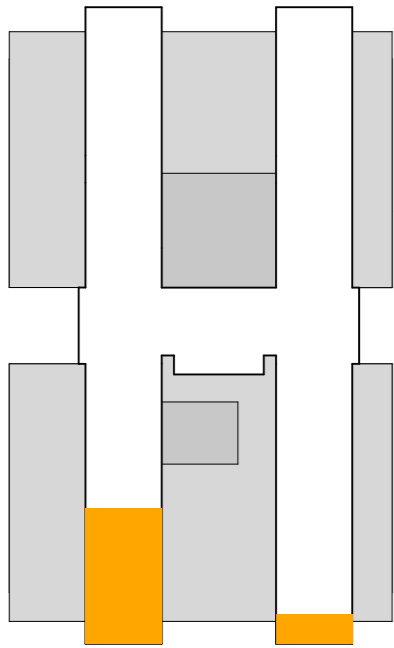
A preliminary Engineering services strategy for the Maitland Hospital has been developed in conjunction with the development of the master planning, architecture and clinical functionality of the building. The key objectives of the engineering design as outlined in NSW Health Infrastructure's Engineering Services Guidelines is as follows:

- The design must be appropriate for the location in terms of climatic conditions, sophistication of services, availability of skills and support
- Design must be adaptable to respond to changes in infrastructure planning, clinical health care models and changes in use, while still aligning to standardised 8.4m x 8.4m grid
- Systems and Equipment including information and communication technology (ICT), Major Medical Equipment (MME) and furniture, fixtures and equipment (FF&E) must be considered in terms of sustainability, availability, reliability and life-cycle costs to achieve overall targets and aspirations
- Design must be robust and resilient, consider the services delivered during normal operations, as well as disaster scenarios
- The engineering system must address hospital functionality, flexibility, clinical services delivery, internal environmental conditions (staff, patient & visitor well-being) and departmental operation
- Integrated built-environment sustainability must be considered, including appropriate designs for energy and water, using appropriate materials. All slabs must have a sacrificial topping slab to accommodate wet areas in the future
- Adaptation for future use must be considered, specifically infrastructure with useful lives greater than 25 years. This includes system configuration and equipment capacity and selection, system design integration, space allowances, all within the master planning framework

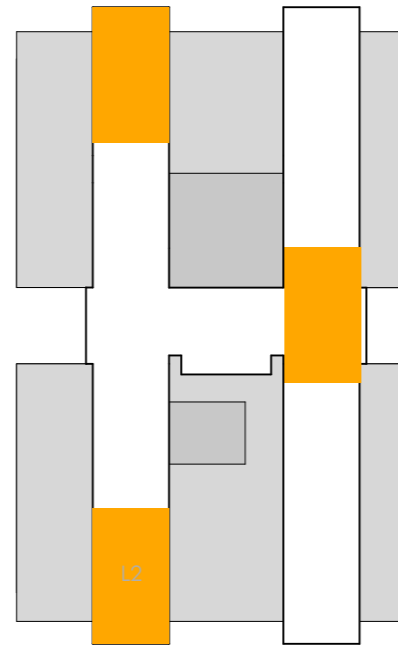


# ENGINEERING SERVICES

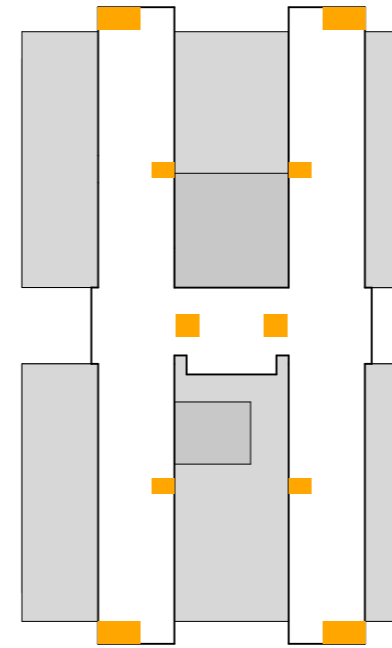
6-2 ENGINEERING STRATEGY



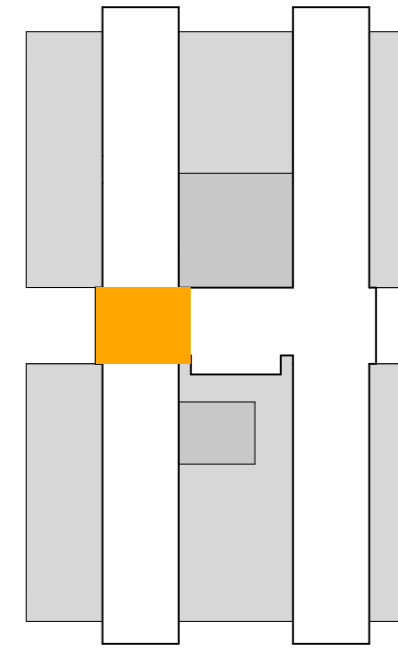
THEATRE PLANT LOCATION  
Level 2; immediately above Theatres



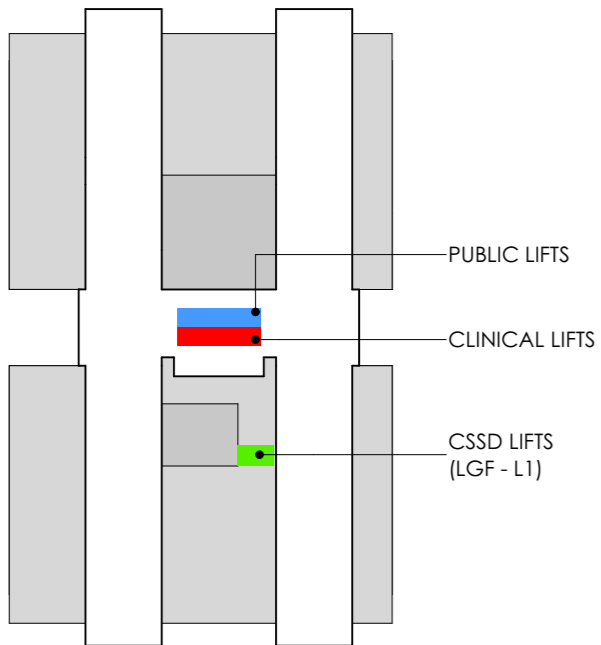
PLANT LOCATION  
Level 5  
Distributed plant layout



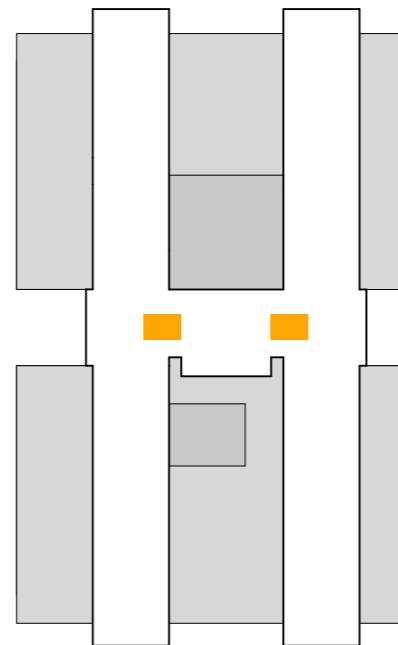
MAIN RISER/PLANT LOCATIONS  
Typical



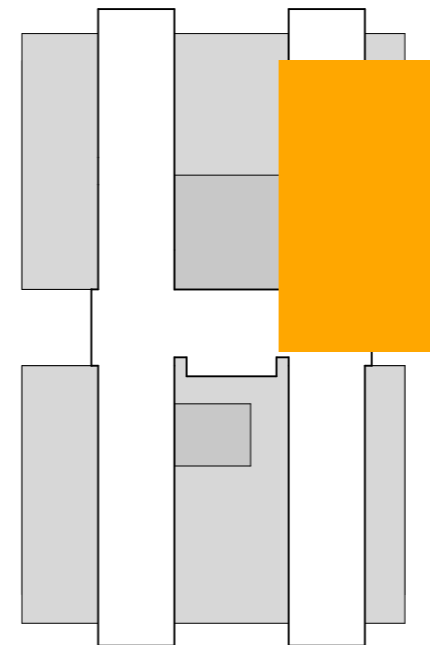
COOLING TOWER LOCATION  
Level 6



VERTICAL TRANSPORTATION  
Typical



ELECTRICAL - COMMUNICATIONS DISTRIBUTION  
Typical  
Centralised around the main lift core servicing the entire building  
EDBs and Comms rooms distributed on each floor



SUBSTATION CHAMBER AND SWITCHBOARD LOCATIONS  
Lower Ground Floor  
Primary hydraulic plan, Server Rm, UPS, DAS