

**BUILDING SERVICES
INFRASTRUCTURE REPORT**
For
Development Application
**Maitland Private Hospital – Stage 7
Carpark & Stage 2 Southwest Level
Wing**
175 Chisholm Rd East Maitland NSW 2323

Project No:
MN13882

Client:
SLR Consulting Australia Pty Ltd

Architect:
HSPC Health Architects

Report Details

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EXECUTIVE SUMMARY

This Infrastructure report has been prepared by Marline Building Services Engineers on behalf of SLR Consulting Australia Pty Ltd for the Maitland private hospital expansion and redevelopment project.

This report outlines the existing Mechanical, Hydraulic and Electrical infrastructure, detailing information on the existing capacity and any augmentation to the services required for the proposed development. The report also details records of consultation with relevant local authorities and agencies. The details within this report are preliminary and based on currently available information and correspondence undertaken at the time of writing.

Upon reviewing all services and the expected future capacity demands; Marline have assessed that the site is generally capable of providing the services required for this development.

TABLE OF CONTENTS

EXECUTIVE SUMMARY 3

1. INTRODUCTION 5

 1.1. General..... 5

 1.2. Site Location..... 5

 1.3. Proposed Development..... 6

2. AUTHORITIES..... 7

 2.1. General..... 7

 2.2. Existing Authority Infrastructure 7

 2.2.1. Electrical Power Supply And Substation 8

3. HYDRAULIC SERVICES..... 9

 3.1.1. Sewer 9

 3.1.2. Water 9

 3.1.3. Gas..... 10

4. WET FIRE SERVICES..... 10

 4.1.1. Fire Hydrant System..... 10

 4.1.2. Fire Hose Reel System 10

 4.1.3. Fire Sprinkler System 10

5. MECHANICAL SERVICES 11

 5.1.1. Air-Conditioning..... 11

 5.1.2. Indoor Units 11

 5.1.3. Outdoor Units 11

 5.1.4. Ventilation..... 11

6. ELECTRICAL SERVICES 14

 6.1.1. Existing Main Switchboard 14

 6.1.2. Proposed Site Main Switchboard 14

 6.1.3. Distribution Boards 14

 6.1.4. Generator and Essential Supply 15

 6.1.5. Communications Systems..... 15

 6.1.6. Nurse Call Systems..... 15

 6.1.7. Fire Detection & Emergency Warning and Intercommunication Services 15

 6.1.8. Security Systems..... 15

1. INTRODUCTION

1.1. General

Marline Pty Ltd Consulting Engineers have been engaged as the electrical, mechanical, and hydraulic consultants to provide professional advice on the proposed works associated with Maitland Private Hospital – Stage 7 Carpark & Stage 2 Southwest Wing expansion.

The intent of this report is to detail the investigations and findings associated with the existing building services (electrical, mechanical and hydraulic) currently servicing the site and advise what upgrade works are required (if any) for these services for future works planned.

The investigations for this Infrastructure Management Plan primarily focuses on the following objectives:

- Identify potential opportunities and site constraints,
- Identify the location, size and capacity of all existing services within the vicinity of the proposed site,
- Identify utility confirmation for the subject site and,
- Identify options to service the site to support the proposed development.

It is important to note that the development will be subject to several regulatory authority approvals including but not limited to; Hunter Water Corporation, Fire & Rescue NSW, electricity supply authority and NBN, that are likely to specify specific requirements for the development impacting on the spatial requirements during detail design stage.

This document provides an assessment of the available infrastructure to service the proposed development with respect to all three disciplines.

1.2. Site Location

The site, being 173-175 Chisholm Road, Ashtonfield NSW 2323, is legally identified as Lot 102 DP 1010923 and has an approximate area of 14,720m². The site slopes from its southern corner down to its north-western corner. The carpark extension is proposed within the southern corner and Stage 2 Southwest Level Wing is proposed within the North East mental health building.

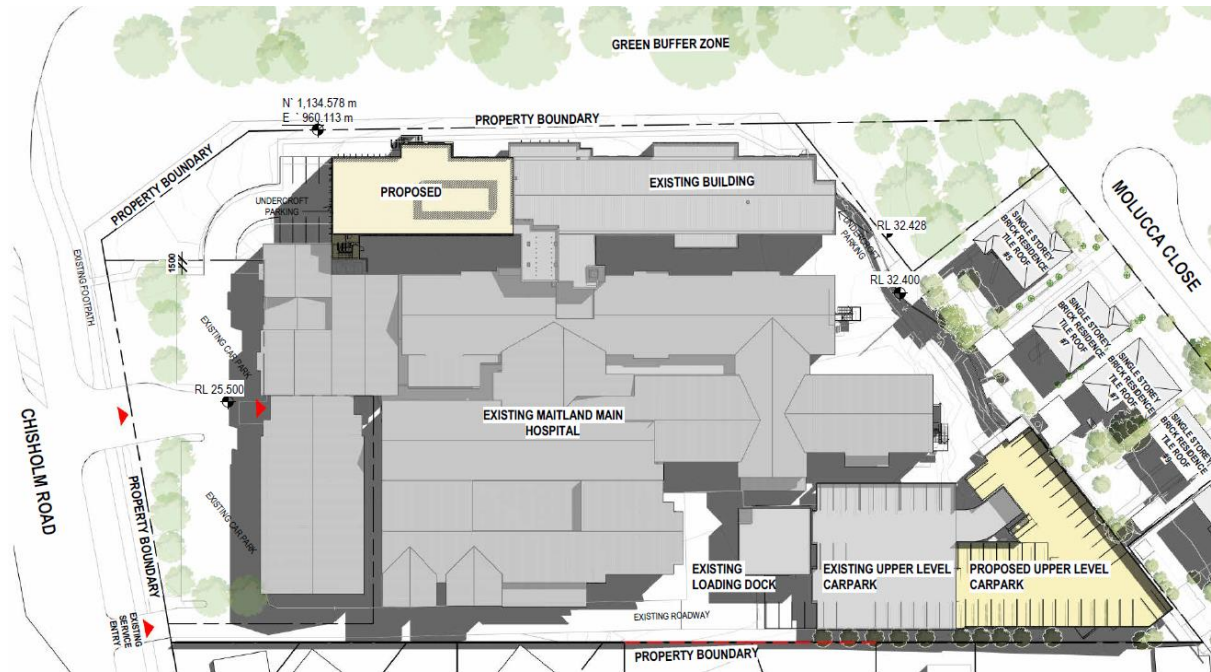


Aerial Map

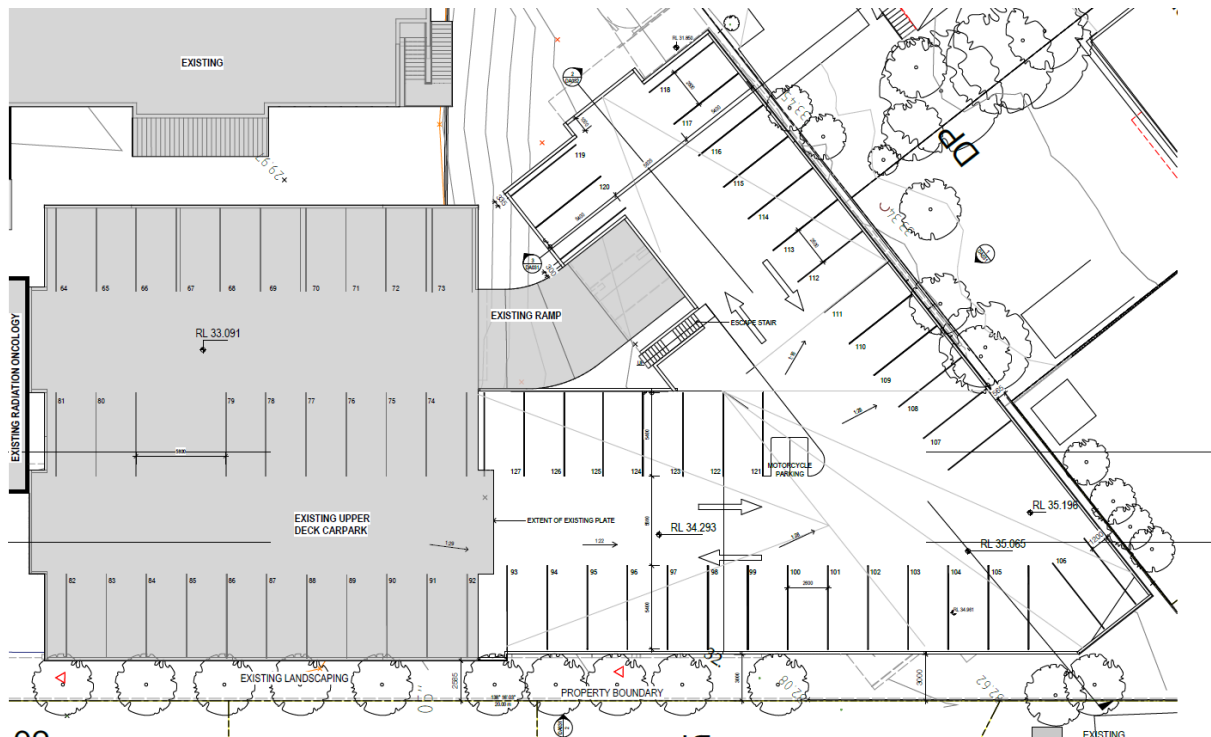
1.3. Proposed Development

The new expansion will include the extension of an existing carpark to include a new level to allow for an additional 63 parking spaces and addition to the Level 2 existing ward building for the purpose of Oncology consulting rooms and 3 additional ward rooms.

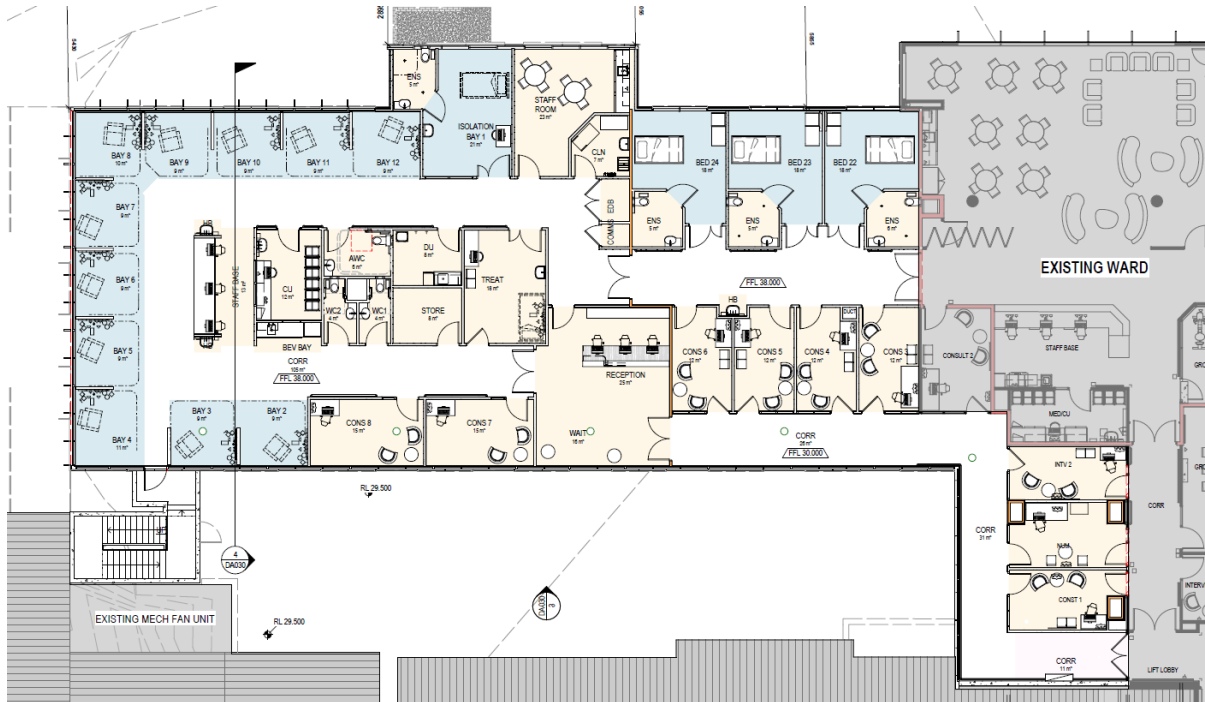
The existing site is operational and services for the new development will be utilised through existing.



Areas Of Proposed Works



Proposed Stage 7 Carpark



Proposed Stage 7 Southwest Level 2 Wing

2. AUTHORITIES

2.1. General

The Electrical, Mechanical and Hydraulic Services installations covered by this infrastructure report shall comply with the regulations and by-laws of all Federal, State, and Local Authorities holding jurisdiction over the works:

- The National Construction Code (NCC BCA 2019 Amendment 1)
- Standards Australia
- Hunter Water Corporation
- Maitland City Council
- FRNSW
- NBN
- Electricity supply authority

Marline has performed non-invasive investigations with respect to the existing site services and additional loading from the proposed building into the existing utility infrastructure available for connection to the site.

Our assessment has been based on site observations and discussions with, and information provided by, the relevant utility authorities.

2.2. Existing Authority Infrastructure

All works will be subject to the appropriate documentation and requirements of council. Based on initial site investigations and recent assessment of the preliminary documentation we anticipate that the following requirements will be applicable:

2.2.1. Electrical Power Supply And Substation

The electrical supply to the development falls within Ausgrid's distribution area. The existing hospital is supplied from an onsite kiosk substation located adjacent the north-western carpark. The substation provides a 1400A rated underground LV feeder to supply the site main switchboard (MSB).

Based on observation of electrical meters on site and independent data logging, the peak load recorded at the site in the last 10 years is approximately 1300A/phase. The supply authority metering is located at the MSB. Based on the previous investigations, it is recommended an upgrade to the site supply via an additional substation is recommended to service these works. The new substation and upgraded site supply would need to service a new site main switchboard. The new site MSB would resupply the existing MSB along with a new main distribution board adjacent the proposed carpark.

The maximum demand finalisation will be subject to load details and future masterplanning requirements, including but not limited to:

- Power and lighting services
- Mechanical & hydraulic Services
- CSSD equipment/appliances provided as part of the refurbishment/extension
- Solar PV scope to the new extension
- Future development areas
- Subdivision and lot consolidation plans

As a minimum, it is recommended that a minimum of 2500 A/phase be provided through the new site Main Switchboard and upgraded site supply.

Marline will submit an application to Ausgrid upon finalisation of the maximum demand during the detailed design phase. This process will inform the exact ASP3 network modification/upgrade scope if required.

3. HYDRAULIC SERVICES

3.1.1. Sewer

Site Sewer Services –

The site is currently connected to the existing Hunter Water Corporation sewer network located at the Northwest corner of the site. No additional connections are proposed or required for these development works.

Proposed Stage 7 Carpark –

The proposed carpark will not include any sanitary drainage fixtures and as such will not require connection to sewer infrastructure.

Proposed Stage 2 Southwest Level Wing –

The proposed Stage 2 Southwest Level Wing is proposed to include 4 x sinks, 14 x hand basins, 7 x water closets and 5 showers. The building is serviced by an existing inground and elevated drainage sewer network available for connection as part the proposed works.

Based on investigation and previous design works undertaken in the area, the existing elevated drainage servicing level 1 can be connected to and extended to service the proposed level 2 works.

Connection to and extension of the existing elevated drainage will impact the existing level 1 rooms below the area of works and as such will require staging of works and notice of shutdown of the rooms.

3.1.2. Water

Site Water Services –

The site is currently connected to the water 200mm water main located within Chisholm Road via a 150mm property service, 50mm water meter for domestic water and 150mm service with 20mm bypass meter for fire services. No additional connections or amplification of site services are proposed or required for these development works.

Proposed Stage 7 Carpark –

The proposed carpark will not include any fixtures requiring potable water connection. However, hose taps may be proposed for installation as requested. Potable water is available to the carpark from an existing 25mm supply located at the fire hose reel on ground floor of the carpark. Connection can be made to this service and extended as required.

Proposed Stage 2 Southwest Level Wing –

The proposed Stage 2 Southwest Level Wing is proposed to include 4 x sinks, 14 x hand basins, 7 x water closets and 5 showers. The existing building level 2 which is currently in works will be serviced by an existing 50mm potable water and 315L heavy duty electric hot water system.

Provision has been designed into the Level 2, 21 bed facility works to provide 1 x 40mm potable water, 1 x 40mm hot water flow capped supply for connection and extension to the new fixtures.

Based on desktop investigation, we believe that the existing water meter and water infrastructure servicing the site will not require amplification due to the proposed new development.

Final potable water supply and fire services will be sized in accordance AS/NZ3500.1.2018 and AS/NZS 2419. 2005 simultaneous demands.

3.1.3. Gas

The site is currently connected to the Jemena Natural Gas network located within Chisholm Road. Based on the current architectural plans, gas services will not be required for the proposed development works.

4. WET FIRE SERVICES

4.1.1. Fire Hydrant System

The existing hospital is currently served by an onsite fire hydrant system.

The existing system comprises a 150mm connection to the 200mm CI/CL water main in Chisholm road, 150mm double detector check valve backflow prevention, 150mm booster valve & suction points, 150mm on-site ring main and multiple onsite internal and external attack hydrants.

A water flow and pressure enquiry has been undertaken and the site has the ability to receive the following flows and pressures:

1. 0.66L/sec @ 580kPa
2. 10L/sec @ 615kPa
3. 20L/sec @ 610kPa
4. 30L/sec @ 605kPa
5. 40L/sec @ 600kPa
6. 50L/sec @ 595kPa

Based on the available flow and pressures, no amplification or alteration is required for the water supply.

Provision has been designed into the Level 2, 21 bed facility works to provide 1 x internal fire hydrant within the fire stairs which will provide coverage to the proposed development.

4.1.2. Fire Hose Reel System

Provision has been designed into the Level 2, 21 bed facility works to provide fire hose reels within 4m of the exist to fire stairs. Additional path of travel fire hose reels may be required if new fire or smoke walls and doors are proposed for installation. This will be determined during the design process. Fire hose reels will be required to the stage 7 carpark.

4.1.3. Fire Sprinkler System

Provision has been designed into the Level 2, 21 bed facility works to provide connection ability to the fire sprinkler system being installed within the existing building. Connection to this services and extension to the new development will be required.

Sprinklers may be required to the stage 7 carpark. Subject to the BCA review.

5. MECHANICAL SERVICES

5.1.1. Air-Conditioning

Marline has reviewed the mechanical systems across the proposed development area. Marline recommends that all new areas are to be provided with new air conditioning system to maintain an acceptable indoor air temperature.

The air-conditioning systems proposed are to be a combination of single split air cooled reverse cycle heat pump systems and Variable Refrigerant Flow (VRF) multi-split systems to provide heating and cooling to each space to suit the load demand. Each area or room will be zoned to suit the exterior and internal load influences to ensure an even temperature can be maintained throughout the various areas.

5.1.2. Indoor Units

The indoor systems shall consist of a mixture of ducted, wall mounted or cassette indoor units to best suit the application and the configuration of the layout.

Ducted indoor units would consist of the unit being installed concealed above ceiling level within the roof space, having ductwork supplying air to the rooms via ceiling grilles and registers. A ceiling access panel will be required for access into the roof space for servicing and replacing filters at the unit.

Wall mounted indoor units would consist of the indoor unit being hung and mounted on the wall at high level below the ceiling level. Consideration of the positioning of the unit would be required to provide an optimal airflow pattern within the space and to avoid drafts or the air movement from the unit being directed onto occupants.

Cassette indoor units would consist of the unit being fully recessed into the ceiling with only the face plate and grille being visible. Units would be centrally located within the room and be configured to blow in 4 directions. Units would be complete with vertical oscillating grilles to allow adjustment of the airflow pattern and provide an even air distribution.

5.1.3. Outdoor Units

Each outdoor condensing unit would be proposed to be in a suitable and non-obtrusive location. Units will typically be mounted on the roof on a platform complete with safe access to provide ease of access for servicing. Areas located adjacent the units fan discharge and intake points will be required to be clear and free obstructions and vegetation to ensure adequate ventilation is achieved to the unit. A ventilated plant enclosure around the units could be provided as an option to enable units to be screened.

5.1.4. Ventilation

Each room or space will be provided with either natural ventilation in accordance with the BCA Clause F4.6 & AS1668.4 – 2012 or mechanical ventilation in accordance with AS1668.2 - 2012 where natural ventilation isn't achievable or is not suitable for the intended use of the space.

Mechanical Ventilation – Supply Air Systems

Mechanical supply air systems will be provided to all habitable spaces where natural ventilation is not achievable or to habitable spaces where air conditioning is provided and relying on opening windows and doors would not be suitable under the normal use of the space.

Mechanical ventilation for air-conditioned areas would be interlocked and incorporated into the air conditioning system where possible.

Mechanical fresh air systems will be proposed but not limited to the following areas:-

- Offices (consultants, interview, and NUM)
- Staff room

- Receptions
- Waiting Area
- Bays
- Corridor and Staff Base
- Bedrooms
- Treat

Mechanical Ventilation – Exhaust Systems

Exhaust systems would be proposed to service all wet areas and rooms where local pollutants are generated that will contaminate and lead to a poor indoor air quality.

The systems shall consist of exhaust fans, controls, ductwork, fittings and grilles to an extraction point in the façade or through the roof.

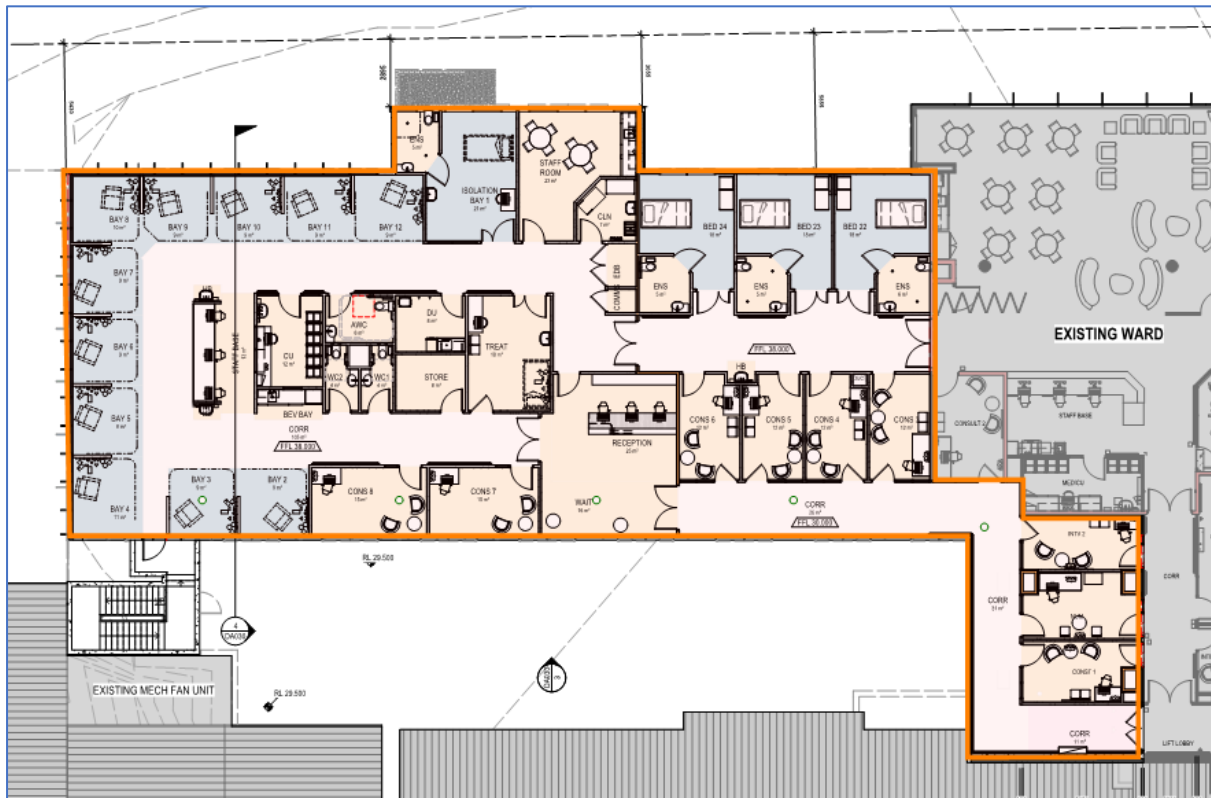
Mechanical ventilation for isolation room:

Isolation rooms shall be monitored by a Direct Digital Control (DDC) system to maintain relative pressure differentials required for the isolation rooms. Motorised dampers are to be provided in supply air, return air, and exhaust air ducting to assist in maintaining isolation room relative pressures. Supply air to isolation rooms shall be via a dedicated indoor unit.

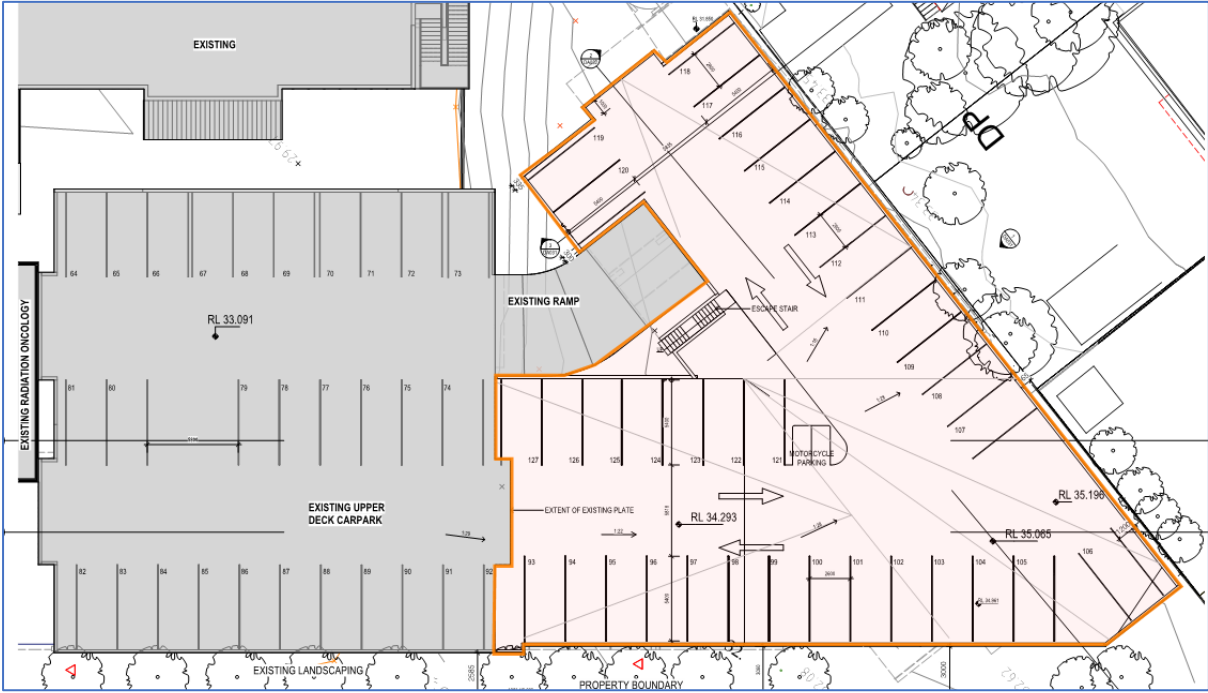
Isolation room is to be exhausted via a dedicated isolation room exhaust system. Isolation room exhaust systems are to be under negative pressure throughout and provided with G4, H8, and HEPA filtration before exhausting a minimum 3 metres above roof level. Provisions shall be made to allow for relocation of exhaust fan and filter module during future works.

Carpark Ventilation:

The carpark in Stage 7 is compliant with natural ventilation, or natural ventilation compliance could be achieved via a performance solution, which will be sufficient to have acceptable air quality.



Proposed Development Area- Stage 2 Southwest Level 2



Proposed Development Area- stage 7 carpark

6. ELECTRICAL SERVICES

6.1.1. Existing Main Switchboard

The existing MSB is located within a dedicated switchboard room on the ground floor of the hospital. The MSB was installed in 2010 as part of a significant hospital upgrade and is rated to 1400A. A Service Protection Device is provided on the line side of the supply authority metering in accordance with NSW Service and Installation Rules. On the nameplate of the switchboard, it is noted that the switchboard was manufactured in accordance with AS 3439.1 and is rated to 25 kA for 1 second. Modification of the existing MSB may be limited by the requirements of AS/NZS 61439.1 and it is approaching its maximum capacity of 1400 A/phase.

It is noted that confirmation will be required from the original switchboard manufacturer (Quad Electrical) that any required modifications to the switchboard can be made in compliance with AS/NZS 61439.1 requirements.

A separate essential supply section is incorporated into the MSB to supply a number of essential distribution boards across the site with an additional essential distribution board (DB-EM) located adjacent the MSB. The existing site generator is located to the north-east of the MSB adjacent the carpark.

The main board supplies non-essential distribution boards in all other buildings located throughout the facility. The existing non-essential distribution boards adjacent the proposed oncology area are supplied from a pillar located adjacent the ground floor carpark and a tee-off box on level 1.

The MSB also notes that the site features a large solar PV system, which is connected into the non-essential distribution system at DB-8.

Note the above is for guidance and subject to the final proposed building design and services provided.

6.1.2. Proposed Site Main Switchboard

A new site Main Switchboard is proposed to service the increased supply to the site. Rating and configuration of the Main Switchboard will be subject to confirmation of the master-planning requirements for the site and consultation with all stakeholders.

New site main switchboard is to be designed in accordance with AS/NZS 61439.1. All new supply authority metering is to be housed within the MSB.

6.1.3. Distribution Boards

Each block/ward throughout the facility has its own dedicated essential and non-essential distribution board(s) with all local circuits terminated to supply general lighting, power and equipment as required. All mechanical services equipment throughout the site are connected back to local MSSBs in accordance with BCA/NCC Section J8.3 requirements. The condition of distribution boards across the site varies greatly based on the age of the installation.

Critically, DB-12E, located adjacent the proposed oncology area, is in good condition and has capacity to provide an additional distribution board within the oncology area. The existing tee-off box adjacent the DB-12E also has capacity to supply the proposed Level 2 fit-out.

The lighting and services associated with the new carpark will be connected to the existing adjacent circuits.

To supply the new Level 2 oncology works, dedicated essential and non-essential electrical distribution boards supplied from new sub-main cables (from the level below) will be distributed throughout the new buildings. All distribution boards will be fitted with Residual Current Device (RCD)

protection to all general power and lighting sub-circuits as per AS/NZS 3000 and AS/NZS 3003 requirements.

6.1.4. Generator and Essential Supply

The entire existing site is supplied from a single diesel genset located externally on the southern side of the site.

Further investigation will be required during the detailed design phase to confirm the essential/non-essential load balance for these areas. Upgrade of the generator to suit the increased site supply and masterplanning considerations should be considered as part of the works.

6.1.5. Communications Systems

The main communications and server room is located on the ground floor of the hospital along the central corridor (within recent day surgery refurbishment). Recent upgrade works were undertaken at the site to update and rationalise the communications infrastructure. The new oncology unit will be supplied from the existing communications cabinet located centrally within Level 2.

As part of the proposed works, all new cabling / reticulation architecture shall adopt a “star” approach. It is proposed that all horizontal cabling shall be Cat 6a F/UTP and that all backbone cabling shall be multi-mode optical fibre, subject to client requirements.

Equipment rooms, cable access ways from the equipment room to communication outlets via communication cable containment provisions, such as cable trays and/or conduits will be provided for the new development area.

All ICT works shall be in strict compliance with the client ICT Services Network Infrastructure specification / design guidelines (to be provided).

6.1.6. Nurse Call Systems

A connection to the existing nurse call system on Level 1 will be provided as part of the oncology works. All new nurse call outlets and connections will need to be reticulated back to the nearest communications cabinet. Ensure all new outlets, equipment, and cabling are of a type to match the existing.

6.1.7. Fire Detection & Emergency Warning and Intercommunication Services

The entire site is provide with a digital fire detection and emergency warning and intercommunications (EWIS) system that appears to have been provided in accordance with NCC/BCA, AS 1670.1, and AS 1670.4 requirements. A central fire indicator panel (FIP) is provided adjacent the main hospital entry point which appears to be in good condition.

An expansion panel may be required within the FIP to service the two new zones associated with the proposed oncology fit-out and any future out-buildings on the site.

All new fire detection and EWIS systems are to be provided in accordance with NCC/BCA, AS 1670.1, and AS 1670.4 requirements.

6.1.8. Security Systems

The building has an existing security system which is distributed throughout the site through a network of LAN cabling and expander panels. New expander panels will be required to service the Level 2 refurbishment area and the mental health unit extension.

All new cabling will be reticulated through the existing pathways in the ceiling space. Partial upgrade of the head-end system may be required to service the new panels in the development areas.