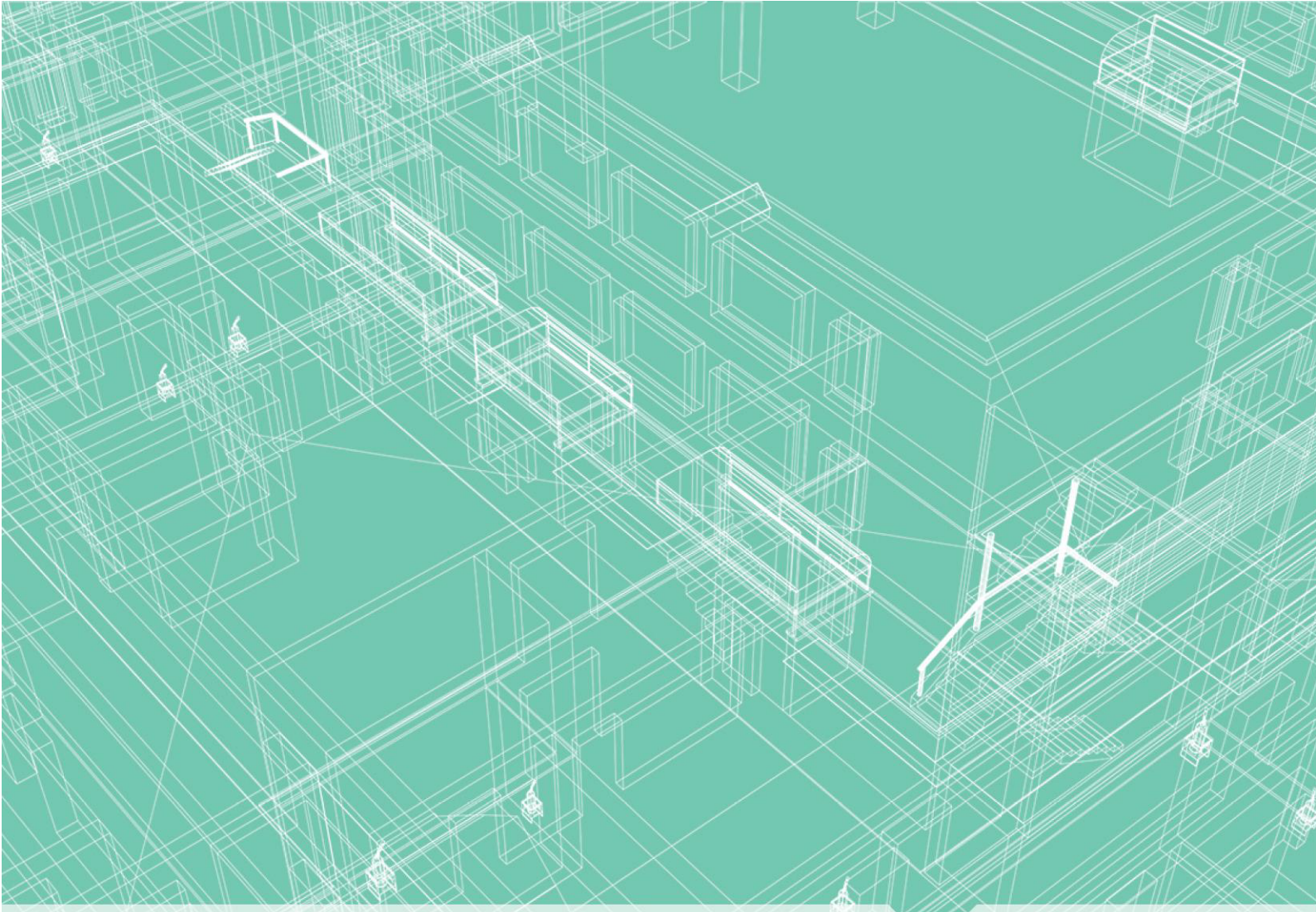

ELECTRICAL SERVICES INFRASTRUCTURE DELIVERY, MANAGEMENT AND STAGING REPORT FOR REVIEW OF ENVIRONMENTAL FACTORS (REF)SUBMISSION

MAITLAND MENTAL HEALTH REHABILITATION PROJECT

ELECTRICAL & COMMUNICATION SERVICES

JHA

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DOCUMENT CONTROL SHEET

Project Number	220441
Project Name	Maitland Mental Health Rehabilitation Project
Description	Infrastructure Delivery, Management and Staging Report for REF Submission
Key Contact	Moien Rashidi

Prepared By

Company	JHA Consulting Engineers
Address	Level 23, 101 Miller Street, North Sydney NSW 2060
Phone	61-2-9437 1000
Email	general@jhaengineers.com.au
Website	www.jhaservices.com
Author	Luke Wheeler , Boris Skapik
Checked	Luke Wheeler
Authorised	Benjamin Cook

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Issued To	Revision and Date								
Turner and Townsend	REV	P1	P2	P3	P4				
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	REV								
	DATE								
	REV								
	DATE								

CONTENTS

1 INTRODUCTION

This Electrical Infrastructure Delivery, Management and Staging Report for REF Submission has been prepared by JHA on behalf of Health Infrastructure (HI) to assess the potential environmental impacts that could arise from infrastructure works at 51 Metford Rd, Metford NSW 2323 (the site). The project is seeking approval for a Development Without Consent (REF) application under Part 5 of the EP&A Act.

This report has been prepared to to provide a overview of key electrical infrastructure proposed to support the development. This report accompanies a Review of Environmental Factors (REF) for the construction and operation of a new mental health services building within the Maitland Hospital campus, including:

- Site establishment
- Site preparation including earthworks;
- Construction of internal roads and addition of at-grade car parks;
- Construction of 2 storey mental health facility;
- 20 Medium Secure Forensic beds; 24 Low Secure Forensic beds; 20 rehabilitation and recovery beds.
- Inground building services works and utility adjustments, including service diversions;
- Building foundation works;
- Tree removal;
- Associated landscaping;.
- Bioretention basin.

Refer to the Review of Environmental Factors prepared by Ethos Urban for a full description of works.

1.1 SITE DESCRIPTION

The site is located at the Maitland Hospital Campus on Metford Road, Maitland, approximately 6.4km from the CBD of Maitland. The project site is located within the development parcel, legally described as Lot 73 DP 1256781, as identified in Figure 1 below. The site is located to the east of the recently constructed Maitland Hospital.

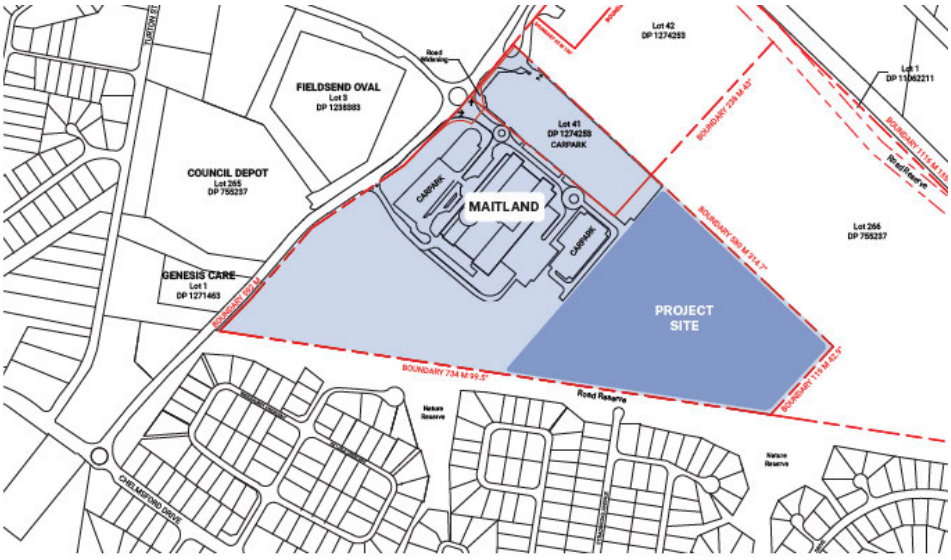

Figure 1 Project locational diagram (Source: Bates Smart)

1.2 STATEMENT OF SIGNIFICANCE

- Based on the identification of potential issues, and an assessment of the nature and extent of the impacts of the proposed development, it is determined that:
    - The extent and nature of potential impacts are primarily limited to the internal Hospital Campus, with no major works proposed external to the site. On this basis, the potential impacts associated with the development are considered relatively minor with respect to and will not have significant adverse effects on the locality, community and the environment.
    - Refer to Appendix A for tabulated impacts and/or risk mitigation measures.

1.3 REF/SEARS DELIVERABLE REQUIREMENT

Below is a summary of the REF/SEARs deliverable requirements and reference to the relevant section of this report.

Item	REF Requirement	Relevant Section of Report
22	**Infrastructure Requirements and Utilities** In consultation with relevant service providers: ▪ assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site. ▪ identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained. ▪ provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development.	Sections 2, 3, 4

The above requirements of the development have been assessed with the below summary provided for each item:

1. Assessment of existing utility infrastructure and assets has been undertaken in parallel to formal discussions with respective utilities.
    a. Ausgrid has confirmed that adequate capacity is available in the existing feeders to supply the existing hospital and the new Mental Health Facilities, and hence no electrical utility works are expected.
    b. There are no new incoming telecommunications provider services proposed, as the development will be leveraging off of existing campus ICT and telco lead-in infrastructure.
2. The Campus is a High Voltage (HV) customer. Onsite infrastructure required to service the development consist of a new private kiosk substation to supply power to the building. The substation is to 'tap-in' to the existing HV ring onsite. Therefore, no offsite infrastructure works are required to support the development. JHA has submitted an Application for Connection with the Supply authority and there are no external utility upgrades or augmentations required to service this development.
3. The new Mental health Building will be constructed under a single primary stage. Internal site works associated with new primary electrical and ICT infrastructure internal to the site is to be conducted under the main package of works. Detailed staging and planning to facilitate connection to the existing HV ring and to existing ICT Campus Infrastructure is ongoing and to be further developed as the project moves into the Design Development Phase.

1.4 LIMITATIONS

This memo is subject to the following limitations:

- The information in this report has been provided based on the survey information of services as provided for the project to date.
- Information provided by third parties and respective Authorities has been utilised in the preparation of this report and have been assumed to be of sufficient accuracy to utilise for the REF process.

2 ELECTRICAL SERVICES

2.1 OVERVIEW

The following key infrastructure works will be associated with the new Development:

- New 1500kVA private kiosk substation.
- Connection of new private substation to existing campus HV Ring. To be situated in dedicated services compound.
- No new authority works proposed external to the Campus. Existing authority HV feeders have been determined adequate to support the development, as well as other known planned works on Campus.
- New 800kVA stand-by diesel generator. External package unit. To be situated in dedicated services compound.
- New Low Voltage (LV) Main Switchroom. To be situated internal to the new building, in close proximity to the Substation / Generator compound.
- New circa-250kW Photo-Voltaic (PV) System on the new development roof.
- Provisions for application of NCC Specification 43 Requirements.
- External lighting, inclusive of internal roadways, pathways, pedestrian areas and the like. These works are to form a seamless solution with those implemented under previous programs, requiring the use of similar fittings and fixtures.
- Minor internal-Campus services diversion and/or decommissioning works.
- All works are to be carefully staged so that operations on campus within other active buildings can be maintained with limited disruption.

2.2 INTERNAL HV CONFIGURATION & HV MAIN SWITCHBOARD

The site has an operation 11kV high voltage ring that reticulates around the site emanating from a boundary HV main switchboard and metering point, currently supplying the 3 off Kiosk substations powering the site. The proposed system shall tap into this ring to add the 4th substation to the ring. Impact to the existing substation shall be minimised by supplying the site from a single feeder until the HV ring is re-established.

The new substation shall transform the supply voltage from 11kV to 400V 3-phase. Noting this is an internal private substation, there are no formal authority easements required.

HV cable pathways shall be laid within "services corridors" with other electrical and ICT services so to minimise planning impacts for future developments.

The below figures outline the HV system concept and potential pathways for the site:

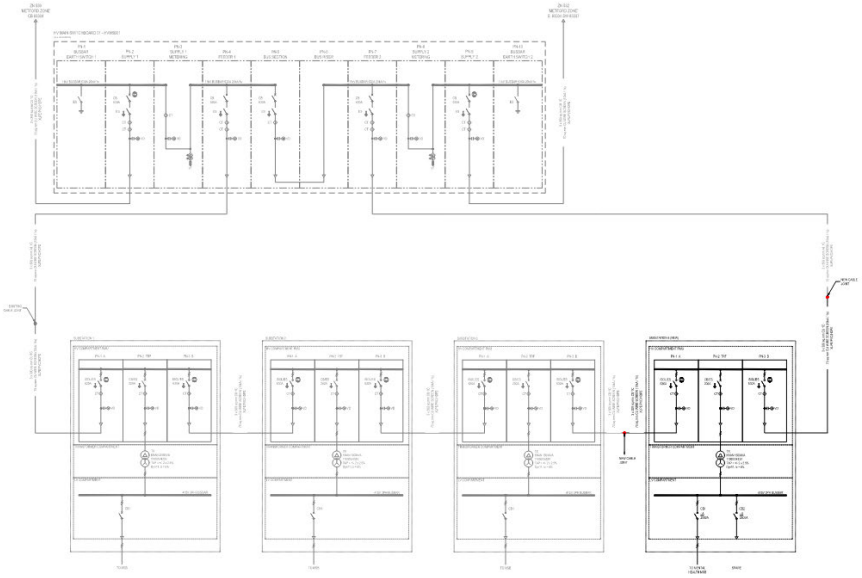

Figure 2 Permanent Supply Concept

2.3 KIOSK SUBSTATION

To supply the MMH facility, it is proposed a single new kiosk substation shall be procured. This kiosk substation shall be owned and operated by the LHD.

The kiosk substation shall be sited in accordance with AS 2067.

Kiosk substations shall be provided to serve the facility electrical supply needs. The kiosk substation shall, as a minimum have the following functionality:

- One kiosk substation is to be established in the services compound, located south of the new facility.
- Kiosk shall be fed from the existing high voltage main switchboard is to be established near the boundary as the interface point between Endeavour Energy's network and the Hospital's network.
- The substations are to conform to AS 2067 and are to meet AS 2067 enhanced protection to minimise fire risk and segregation requirements.
- A transformer handling area in front of the equipment areas is to be provided. Methods similar to utility requirements are to be employed, using a Franna crane for moving large equipment in and out of the substation areas.
- The substations will be naturally ventilated through an integral housing which is supplied from the manufacturer. Substation's cooling systems shall be specified so that continuous supply at transformer maximum capacity is achievable 24/7, 365-days per year.
- 24/7 access is to be provided for heavy vehicle movement to the substation. The access way is to allow heavy vehicle movements from a public road to the substation area
- All works are to be in accordance with AS 2067, AS 3000, NSW SIR and any other relevant codes or standards.

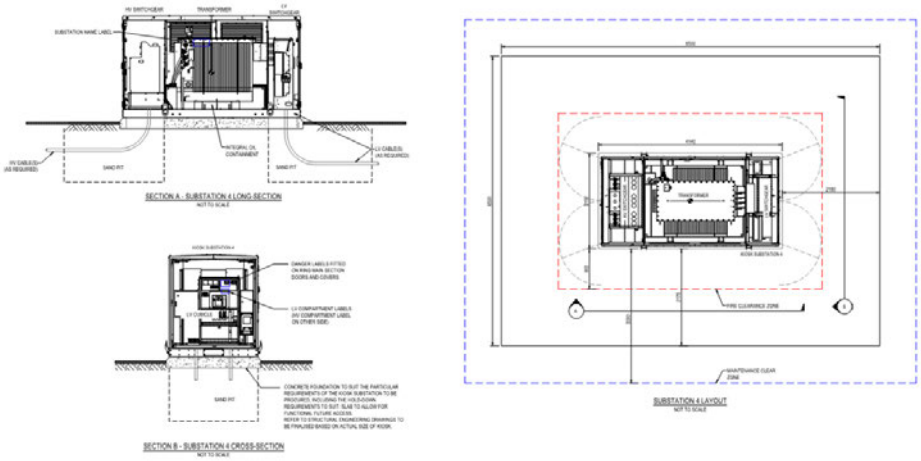

Figure 3 Kiosk Substation Detail

2.4 STAND-BY DIESEL GENERATOR

A new 800kVA external package diesel generator is proposed to provide stand-by power to nominated services within the proposed development.

Typically, the following general principles (as stated in the ESG's) are applied (as a minimum) to determine the minimum standby power requirements on a project:

- All life and safety requirements as required by the NCC.
- NCC 2022 additional mechanical systems due to bushfire prone area. It is proposed that HVAC systems associated with NCC Specification 43 tenability be supported by stand-by diesel generation.
- All ICT communications rooms active equipment.
- Pneumatic tube, Medical air and suction equipment.

- Approximately 30% of lighting and power in all areas. This can vary depending on the number of light fittings and power outlets used in any particular room.
- Full lighting and power in critical areas.
- Nominated air handling and exhaust fans serving critical areas and where required to support operations.
- Critical storage such as -80°C fridges (where applicable).
- Sewage pumping stations, as applicable.
- Domestic water pumps, as applicable.

2.4.1 NCC SPECIFICATION 43 APPLICATION

NCC 2022 Specification 43 necessitates that emergency power systems be capable of supporting mechanical systems operation during a bushfire event, to achieve internal tenability requirements for a minimum of 6-hrs.

Due to the anticipated application of NCC 2022 Specification 43, the new stand-by generator will be up-rated beyond typical NSW Health ESG requirements.

JHA is liaising with generator manufacturers to establish additional provisions to enable the generator to function during a fire event. There are three primary issues associated with bushfire risk and generator operation:

a. Radiant heat.

b. Ember attack.

c. Hot air.

To shield the generators from radiant heat, a solid brick/masonry wall may be implemented around the external electrical infrastructure compound, to mitigate against radiant heat from a fire-front directly approaching the generator. The need for this provision is currently being assessed as part of Specification 43 coordination.

Noting the generator will be containerised and built from non-combustible materials, there should in principle be no combustible materials on the exterior of the generator containers, mitigating risk associated with falling embers.

Generator Intake vents will incorporate filtering to prevent sucking embers into the engine.

Oversized radiator for heat rejection shall be investigated, along with motorised air inlet vanes to exclude dust and embers whilst the generator is not running.

The diesel tank will be fire rated.

2.5 MAIN SWITCHBOARD

A new LV Main Switchroom is proposed on lower ground of the new facility. This switchroom is to be situated in close proximity to the new substation and stand-by diesel generator.

A new LV Main Switchboard (MSB) is to be established within the new switchroom. The main switchroom is to be 2-hr fire rated and be provided with dual egress in accordance with AS 3000.

Private metering will be implemented throughout both main switchboards to satisfy statutory requirements of Section J8 of the NCC.

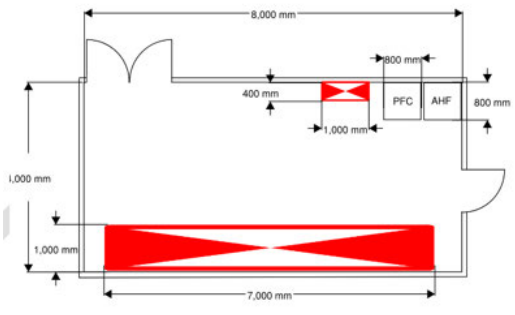

Figure 4 preliminary Main Switch Room Set-out

2.6 MAJOR ELECTRICAL INFRASTRUCTURE LOCATIONS

Refer to Appendix C for the overall Electrical and ICT Services Site Infrastructure Plan, associated with this development. Note: there are no external Campus infrastructure proposed to support this development.

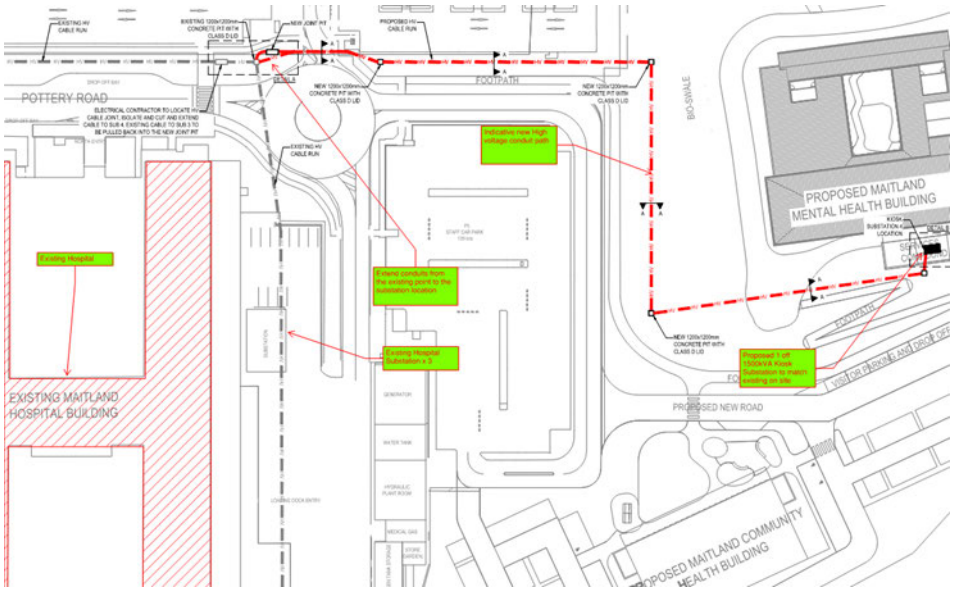

Figure 5 HV Infrastructure

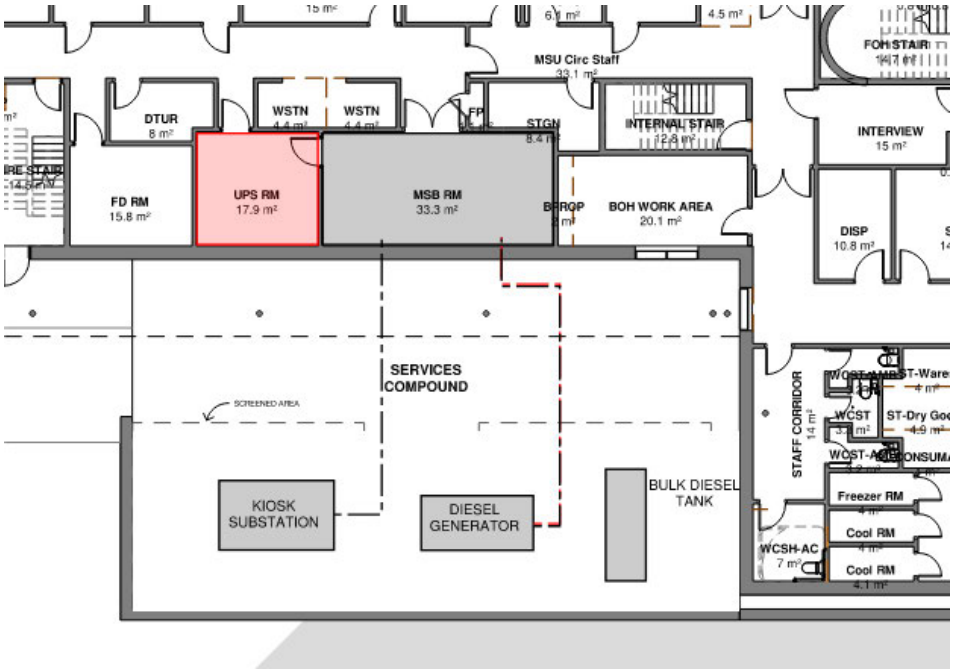

Figure 6 Proposed External Electrical Infrastructure Compound.

2.7 PHOTO-VOLTAIC (PV) SYSTEM

It is proposed that a new PV system be installed on the new development roof. At this stage, the project team is designing and provisioning for installation of a system in the order of 250kW nominal capacity.

Refer to Appendix C for the overall Electrical and ICT Services Site Infrastructure Plan, associated with this development. Note: there are no external Campus infrastructure proposed to support this development.

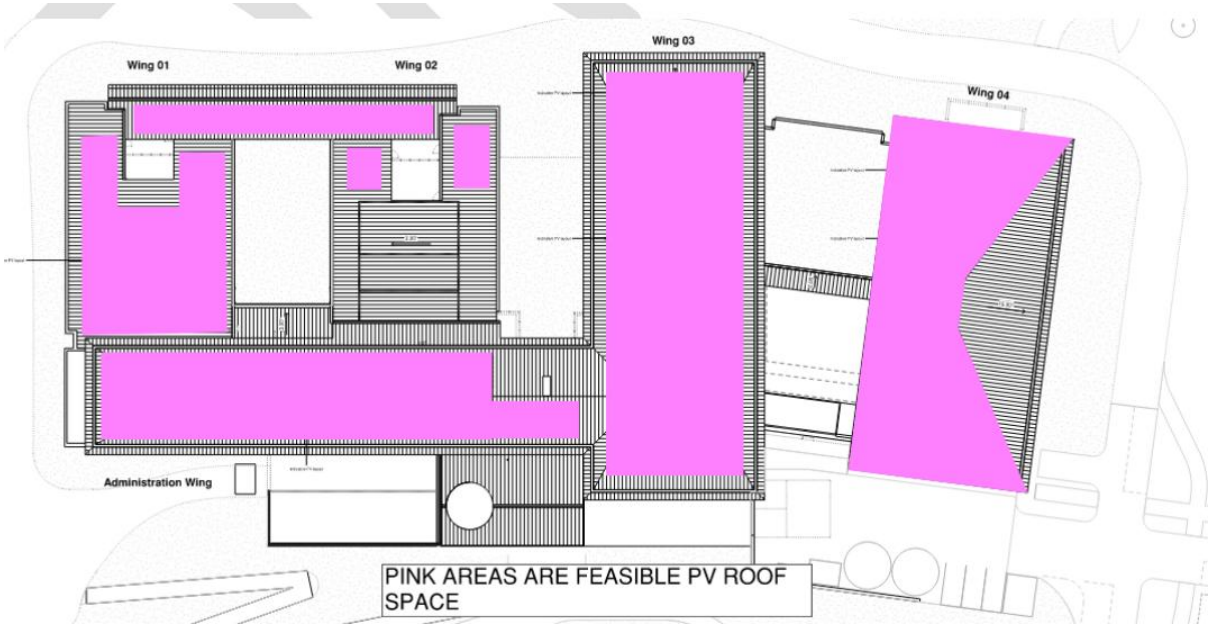

Figure 7 Proposed PV System Implementation

2.8 EXTERNAL LIGHTING

The external lighting shall follow the below design requirements. External lighting schemes and layouts shall be determined in design development and detailed design.

- Lighting control systems shall be IP based and be able to readily interface with the site BMS for timing, switching, control and monitoring etc.
- The nature and positioning of the lighting shall also follow the lighting selected in previous recent developments on Campus.
- Automation and control of the lights across each area is important to ensure a seamless appearance. Lights are to be time switch controlled in combination with photoelectric cells. It is assumed a common time clock philosophy will be utilised across all campus buildings to ensure that lights are activated at the same time, with master control via the BMS. The use of separate photoelectric cells on each building may result in a staggered activation of lights; however, this can be mitigated utilising timeclock override where desired.
- Exterior lighting will be provided in accordance with NSW Health's policy manual, 'Protecting People and Property (noting that lighting will be connected to the generator supply and not the UPS), as well as compliance to AS 1158.3.1 and AS 4282. Lighting designs will achieve recommended light levels for safety and security, while allowing for full function of CCTV surveillance.
- All new external lighting will be connected to the generator supply.

As noted above all external lighting associated with the development will be designed in accordance with both AS/NZS 1158.3.1 Lighting for roads and public spaces series and AS 4282 Control of Obtrusive Lighting.

Careful consideration will be given to not only neighbouring sites, but also existing buildings and infrastructure internal to the Campus, in order to establish an overall lighting design and aesthetic that minimises glare and undesirable illumination levels to surrounding sensitive receivers and where necessary, includes mitigation management measures.

3 COMMUNICATION SERVICES

3.1 OVERVIEW

Proposed key ICT Infrastructure Works associated with the new Development as follows:

1. 2-off new ICT Building Distributor Rooms on Lower ground. To also serve as local Floor Distributors (FDs).
2. 24 core SMOF fibre optic backbone interfaces via fully diverse paths from each campus distributor to each building distributor.
3. 2-off ICT Floor Distributors on Ground Floor.
4. 24 core SMOF fibre optic backbone interfaces between each BD and each FD, via diverse pathways.
5. Security and CCTV to leverage off existing hospital systems.
6. Nurse call to expand upon existing hospital system.
7. Existing campus Mobile Coverage / Distributed Antenna System (DAS) system to be extended into the new development, utilising remote repeater infrastructure. Note: there are no new lead-in services proposed for this development, all works required to extend DAS coverage will be internal to the Campus.

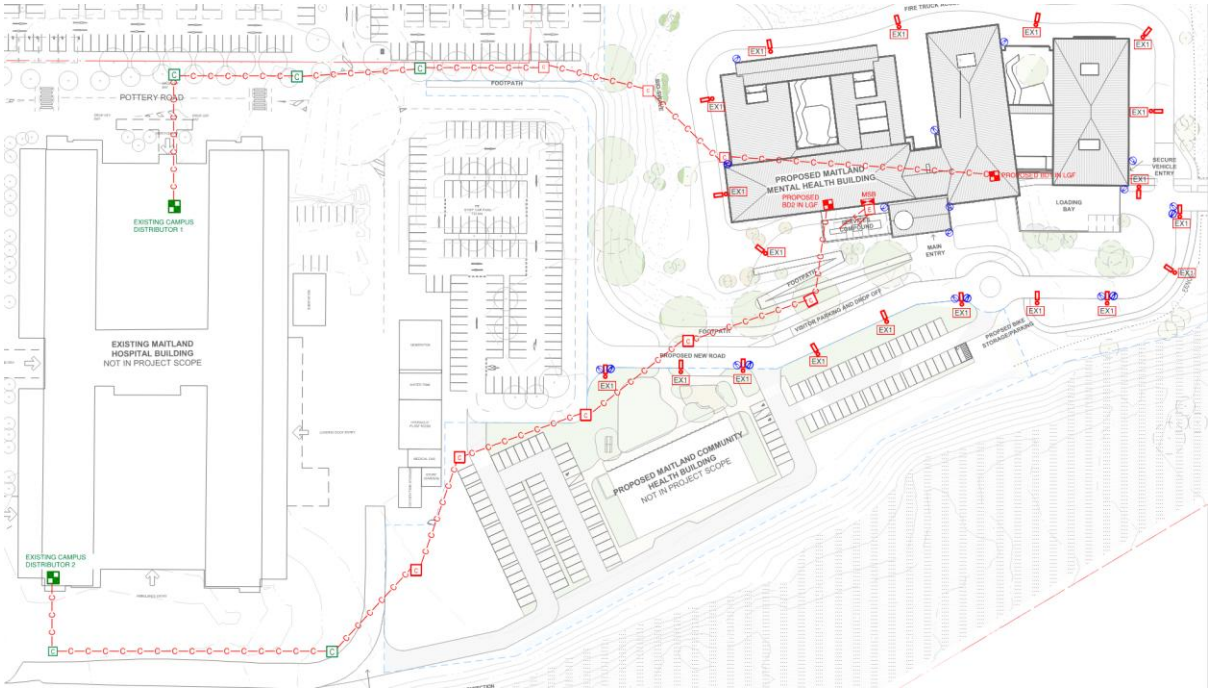

Figure 8 Internal ICT (Private) Backbone Reticulation

3.2 INCOMING TELCO SERVICES

There are no new incoming telecommunications provider services proposed, as the development will be leveraging off of existing campus ICT and telco lead-in infrastructure. All ICT backbone connectivity will occur internal to the Campus to extend existing customer services coverage.

4 INFRASTRUCTURE STAGING

The new Mental health Building will be constructed under a single primary stage.

Internal site works associated with new primary electrical and ICT infrastructure internal to the site is to be conducted under the main package of works.

Detailed staging and planning to facilitate connection to the existing HV ring and to existing ICT Campus Infrastructure is ongoing and to be further developed as the project moves into the Design Development Phase.

5 CONCLUSION

Existing and new electrical infrastructure proposed to support the new development has been assessed as adequate, with consideration to the following:

1. Assessment of existing utility infrastructure and assets has been undertaken in parallel to formal discussions with respective utilities.
    a. Ausgrid has confirmed that adequate capacity is available in the existing feeders to supply the existing hospital and the new Mental Health Facilities, and hence no electrical utility works are expected.
    b. There are no new incoming telecommunications provider services proposed, as the development will be leveraging off of existing campus ICT and telco lead-in infrastructure. All ICT backbone connectivity will occur internal to the Campus to extend existing customer services coverage.
2. The Campus is a High Voltage (HV) customer. Onsite infrastructure required to service the development consist of a new private kiosk substation to supply power to the building. The substation is to 'tap-in' to the existing HV ring onsite. Therefore, no offsite infrastructure works are required to support the development.
3. The new Mental health Building will be constructed under a single primary stage. Internal site works associated with new primary electrical and ICT infrastructure internal to the site is to be conducted under the main package of works. Detailed staging and planning to facilitate connection to the existing HV ring and to existing ICT Campus Infrastructure is ongoing and to be further developed as the project moves into the Design Development Phase.

APPENDIX A: MITIGATION MEASURES

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
D	The extent and nature of potential impacts are primarily limited to the internal Hospital Campus, with no major works proposed external to the site. On this basis, the potential impacts associated with the development are considered relatively minor with respect to and will not have significant adverse effects on the locality, community and the environment.	Section 1.2
D	NCC 2022 Specification 43 necessitates that emergency power systems be capable of supporting mechanical systems operation during a bushfire event, to achieve internal tenability requirements for a minimum of 6-hrs. Due to the anticipated application of NCC 2022 Specification 43, the new stand-by generator will be up-rated beyond typical NSW Health ESG requirements. JHA is liaising with generator manufacturers to establish additional provisions to enable the generator to function during a fire event. There are three primary issues associated with bushfire risk and generator operation: a. Radiant heat. b. Ember attack. c. Hot air. To shield the generators from radiant heat, a solid brick/masonry wall may be implemented around the external electrical infrastructure compound, to mitigate against radiant heat from a fire-front directly approaching the generator. The need for this provision is currently being assessed as part of Specification 43 coordination. Noting the generator will be containerised and built from non-combustible materials, there should in principle be no combustible materials on the exterior of the generator containers, mitigating risk associated with falling embers. Generator Intake vents will incorporate filtering to prevent sucking embers into the engine. Oversized radiator for heat rejection shall be investigated, along with motorised air inlet vanes to exclude dust and embers whilst the generator is not running. The diesel tank will be fire rated.	Section 2.4.1
D	All external lighting associated with the development will be designed in accordance with both AS/NZS 1158.3.1 Lighting for roads and public spaces series and AS 4282 Control of Obtrusive Lighting. Careful consideration will be given to not only neighbouring sites, but also existing buildings and infrastructure internal to the Campus, in order to establish an overall lighting design and aesthetic that minimises glare and undesirable illumination levels to surrounding sensitive receivers and where necessary, includes mitigation management measures.	2.8

APPENDIX B: AUSGRID LOAD CONFIRMATION

Luke Wheeler

From: Nigel Goodwin [redacted]
Sent: Thursday, 13 June 2024 8:46 AM
To: Boris Skapik
Cc: Moien Rashidi
Subject: RE: 1900128694 TENAMBIT - Metford private Hospital
Attachments: App.C SC13782_Ausgrid Settings Review Update (23-01-2020).pdf

Hi Boris
As long as your private settings do not exceed the previously approved as per the attachment, then Ausgrid has no further issues. You can change your settings to meet these requirements at your leisure on site. Please follow the operation protocol procedures if outages are required on any of the 11kV Ausgrid feeders.

Regards

Nigel Goodwin | Contestable Project Co-ordinator | Connections | Customer & Partner Experience

Ausgrid Connecting communities, empowering lives

Level BLOCK A, 145 Newcastle Road Wallsend NSW 2287 AUSTRALIA
☎: [redacted] 🖷: [redacted] [redacted] | ✉: [redacted]

For Official use only

From: Boris Skapik [redacted]
Sent: Wednesday, June 12, 2024 9:27 AM
To: Nigel Goodwin [redacted]
Cc: Moien Rashidi [redacted]
Subject: RE: 1900128694 TENAMBIT - Metford private Hospital

Hi Nigel,

I have attached the previous protection settings from Ausgrid that we received, and in summary we are happy to keep the settings as they are.

One thing that I noticed is that it appears that the Hospitals protection settings appear to have been set below the limits set by Ausgrid (which technically isn't a problem but needs to be updated due to the additional load now, this is based on the information we have atm, I will need to clarify this on site). Assuming the settings do need to be updated, is there any special considerations required to allow the electrical contractor to do this?

Regards,

Boris Skapik CPEng MIEAust NER RPEQ
Associate

JHA

Level 20, 2 Market Street, Sydney, NSW 2000
PO Box Q453, Queen Victoria Building, NSW 1230
[redacted]
Sydney | Brisbane | Melbourne | www.jhaservices.com

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From: Nigel Goodwin [redacted]
Sent: Friday, June 7, 2024 7:21 AM
To: Boris Skapik <[redacted]au>
Subject: RE: 1900128694 TENAMBIT - Metford private Hospital

Hi Boris
Can you please forward the private protection settings through for assessment, or confirm they will not be changing from the current settings.

Regards

Nigel Goodwin | Contestable Project Co-ordinator | Connections | Customer & Partner Experience

Ausgrid Connecting communities, empowering lives

Level BLOCK A, 145 Newcastle Road Wallsend NSW 2287 AUSTRALIA
[redacted]

Please consider the environment before printing this email

For Official use only

From: Boris Skapik [redacted]
Sent: Thursday, June 6, 2024 5:21 PM
To: Nigel Goodwin [redacted]
Cc: Moien Rashidi [redacted]
Subject: RE: 1900128694 TENAMBIT - Metford private Hospital

Hi Nigel,

Please find attached latest contact list,

Regards,

Boris Skapik CPEng MIEAust NER RPEQ
Associate

JHA

Level 20, 2 Market Street, Sydney, NSW 2000
PO Box Q453, Queen Victoria Building, NSW 1230
[redacted]
Sydney | Brisbane | Melbourne | www.jhaservices.com

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From: Nigel Goodwin <[redacted]
Sent: Thursday, June 6, 2024 9:42 AM
To: Boris Skapik <[redacted]
Cc: Moien Rashidi <[redacted]>
Subject: RE: 1900128694 TENAMBIT - Metford private Hospital

Hi Boris
Can you please confirm the attached contacts list is still valid from the customers side to enable the operating protocol to be updated accordingly. Thanks

Regards

Nigel Goodwin | Contestable Project Co-ordinator | Connections | Customer & Partner Experience

Ausgrid Connecting communities, empowering lives

Level BLOCK A, 145 Newcastle Road Wallsend NSW 2287 AUSTRALIA
[redacted]

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From: Boris Skapik [redacted]
Sent: Friday, May 31, 2024 3:50 PM
To: Nigel Goodwin [redacted]
[redacted]
Subject: RE: 1900128694 TENAMBIT - Metford private Hospital

Hi Nigel,

Hope you are well, I am working on the HV system with Moein on this project, as requested please see attached SLD and reticulation,

Please let us know if you need any further information,

Regards,

Boris Skapik CPEng MIEAust NER RPEQ
Associate

JHA

Level 20, 2 Market Street, Sydney, NSW 2000
PO Box Q453, Queen Victoria Building, NSW 1230
[redacted]
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From: Nigel Goodwin [redacted]
Sent: Wednesday, May 29, 2024 11:29 AM
To: Moien Rashidi [redacted]
Subject: 1900128694 TENAMBIT - Metford private Hospital

Hi Moien
I can confirm receipt of your application for the hospital extension. I have sent a request to our HV planners to ensure capacity in the network, please be aware this may take a few weeks for a response. Can you please forward a copy of the private 11kV reticulation showing the additional transformers. Thanks

Regards

Nigel Goodwin | Contestable Project Co-ordinator | Connections | Customer & Partner Experience

Ausgrid Connecting communities, empowering lives

Level BLOCK A, 145 Newcastle Road Wallsend NSW 2287 AUSTRALIA
[redacted]

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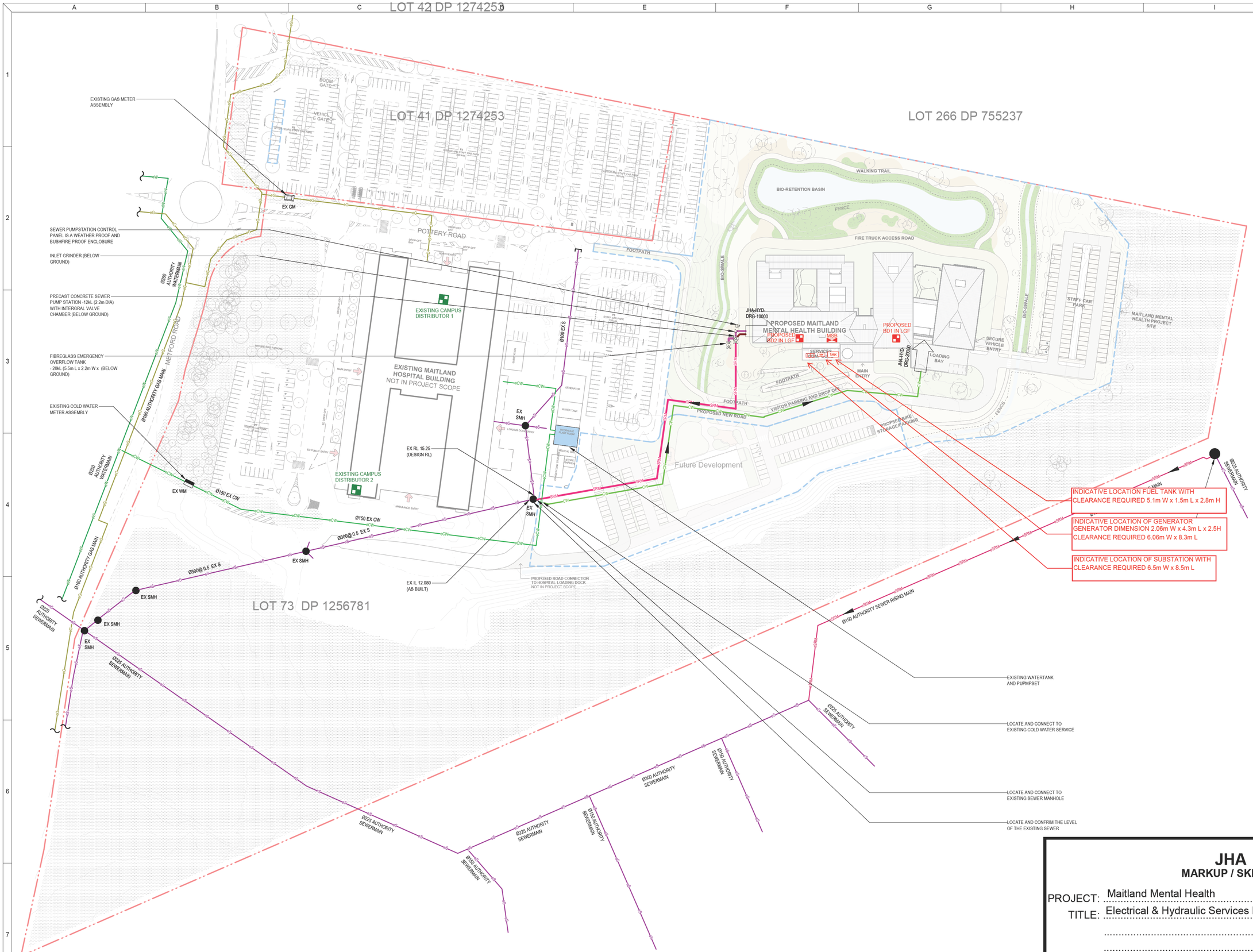
APPENDIX C: INTERNAL SITE ELECTRICAL PLAN



All dimensions to be verified on site/s prior to commencement of on-site work and/ or off-site prefabrication. Figured dimension to be taken in preference to scaled dimensions. This drawing is copyright and remains the property of JHA Consulting Engineers. Reproduction in whole or part of these drawings without written consent constitutes an infringement of copyright.

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
1	10.09.24	100% SCHEMATIC DESIGN	V.K.

CLIENT

ARCHITECT

BATESSMART

Melbourne 1 Nicholson Street Melbourne VIC 3000 Australia T 03 8664 6200 F 03 8664 6300 email mel@batessmart.com.au http://www.batessmart.com.au

Sydney 43 Brisbane Street Surry Hills NSW 2010 Australia T 02 8354 5100 F 02 8354 5199 email syd@batessmart.com.au http://www.batessmart.com.au

CONSULTANT

JHA

Level 20, 2 Market Street, Sydney NSW 2000 Australia

+61 (02) 9437 1000

general@jhaengineers.com.au

www.jhaservices.com

PROJECT

Maitland Mental Health Rehabilitation Project

Metford Rd, Metford NSW 2323

JHA
MARKUP / SKETCH

PROJECT: Maitland Mental Health

TITLE: Electrical & Hydraulic Services Infrastructure Plan

REVISION: P1

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