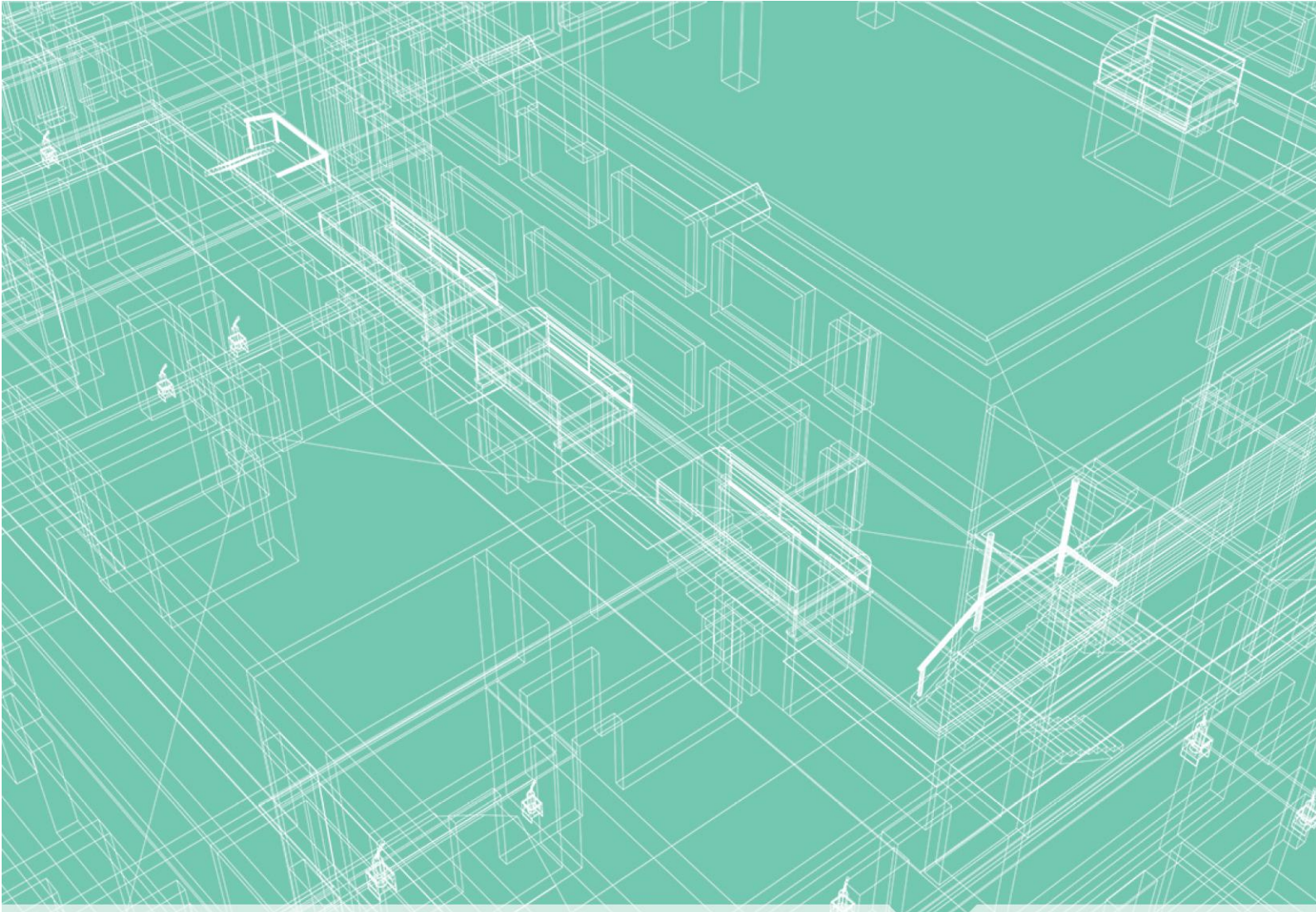

ELECTRICAL SERVICES DESIGN STATEMENT FOR REVIEW OF ENVIRONMENTAL FACTORS (REF) SUBMISSION

CESSNOCK HOSPITAL REDEVELOPMENT

ELECTRICAL SERVICES

JHA

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DOCUMENT CONTROL SHEET

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CONTENTS

1 INTRODUCTION

This Electrical Services Design Statement has been prepared by JHA Consulting Engineers on behalf of Health Infrastructure to assess the potential environmental impacts that could arise from the redevelopment of the Cessnock Hospital health service at 24 View Street, Cessnock.

This report has been prepared to provide a summary of the infrastructure available to the site, determine the points of connection and suitability for the proposed works, and assess any impact related to light spills beyond the property boundary.

This report accompanies a Review of Environment Factors that seeks approval for the construction and operation of a new two-storey clinical services building and refurbishment works, including:

- Demolition of select existing structures.
- Construction of a new hospital building on the site's northern portion.
- Realignment of internal roads and a new primary vehicular and pedestrian entrance to the hospital campus from Jurd Street.
- New kerb, gutter and road resurfacing on Jurd Street
- Refurbishment of the existing at-grade car park.
- Installation and realignment of selected services.
- Installation of ancillary development including, but not limited to, lighting and signage.
- Landscaping.

For a detailed project description, refer to the Review of Environmental Factors prepared by Ethos Urban.

1.1 SITE DESCRIPTION

The site is located at 24 View Street, Cessnock, in the Cessnock Local Government Area. It is occupied by Cessnock Hospital health service, a district-level hospital in the Hunter New England Local Health District. The site comprises the following lots.

- Lot 2 DP1173784
- Lot 7 DP13203
- Lot 8 DP13203
- Lot 1 DP103663
- Lot 10 DP5442
- Lot B DP103664
- Lot 2 Section 20 DP5442
- Lot 1 DP254743
- Lot 11 DP882585

An aerial image of the site is shown at Figure 1.

Figure 1 – Site Aerial – Source: Nearmap

1.2 PROJECT DESCRIPTION

The Cessnock Hospital is a district-level hospital within the Hunter New England Local Health District. It provides low-acuity medical and sub-acute services to the local community and is networked with Maitland Hospital for higher-acuity services and John Hunter Hospital for tertiary-level services.

The clinical services provided by the project will be generally consistent with what is currently being provided at the Hospital, except f changes in services where network efficiencies are identified.

The project scope includes the following clinical services:

- Emergency Department (ED)
- Medical Imaging
- Perioperative Suite
- Sterilizing Services Unit (SSU)
- 2 x 28 Bed Inpatient Units (IPUs)
- Pharmacy
- Mortuary
- Front of House (FOH) services

The overall project scope also includes the following:

- Demolition of select existing structures.
- In-ground infrastructure and enabling works
- A new acute services building containing the above clinical services
- A new primary vehicular and pedestrian entrance to the hospital campus from Jurd Street
- New vehicular drop-off
- Refurbishment of the existing on-grade car park
- A new connection between the new hospital building and the existing
- New kerb, gutter and road resurfacing on Jurd Street
- Landscaping.

1.3 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 low and will not have significant adverse effects on the locality, community and the environment;
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal effect on the locality, community.

1.4 ELECTRICAL SERVICES OVERVIEW

JHA has reviewed the existing electrical infrastructure for electrical and telecommunications services at/around the site to assess the infrastructure availability and service options that can serve the proposed works.

The following sources of information were assessed at the time of writing this report and have been used to provide a summary of the existing electrical and telecommunications services infrastructure available and its suitability and intended service of the site.

The infrastructure and connection points and their suitability have been based on the following:

- Information obtained via Dial Before You Dig plans
- Ausgrid Geographic Information System (GIS), which shows the type and location of Ausgrid assets
- Preliminary discussions/ review of Authorities/utilities requirements
- Architectural information, including town planning drawings.

- The latest iteration of the documentation of the proposed Ausgrid Network Augmentation Works prepared by the JHA ASP Level 3 design team.

The content of this document should be read in conjunction with the documents produced by the architect and other consultants for all other disciplines.

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

- Upgrade of the existing 800kVA kiosk substation for a new 1,000kVA kiosk substation, both owned and operated by Ausgrid.
- Connection of new kiosk substation to existing Ausgrid HV network on Foster St.
- New Low Voltage (LV) Main Switchroom (MSB). To be situated in a new stand-alone building, in close proximity to the new kiosk Substation.
- New LV Main Distribution Room (MDB). To be located internal to the New Build.
- New 400kVA stand-by diesel generator. External package unit. To be situated on the roof of the New Build in an acoustically treated enclosure
- New circa-220kW Photo-Voltaic (PV) System on the new development roof.
- External lighting, inclusive of internal roadways, carparks, 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.
- New NBN lead-in service from Jurd St to the New Build to serve as a diverse pathway to the campus.
- Minor internal campus services diversion and decommissioning works.
- All works are to be carefully staged so that operations on campus within other active buildings can be maintained with limited disruption. When required, coordination with the stakeholders will take place for the provisions of temporary diesel generators to minimise the disruption to the hospital power supply.

1.5 CODES AND AUTHORITIES' REQUIREMENTS

The design for the proposed works' services will be carried out in accordance with the requirements indicated within the latest editions of all current and appropriate Australian Standard documents, Codes of Practice and Building Regulations approved documents. Wherever a Standard or Code of Practice is referred to, it will imply the latest issue and/or revision applicable at the time of preparing this report. The design will comply with the latest publication of all relevant codes, standards and regulations, including but not limited to:

Codes and Standards

Electrical Installations	AS/NZS 3000:2018 Amd 3
Electrical Installations – Patient Areas	AS/NZS 3003:2018
Electrical Installations – Selection of Cables	AS/NZS 3008:2009
Low Voltage Switchgear & Control Gear Assemblies	AS/NZS 61439.1:2016
Electrical Installations – Emergency Power Supplies in Hospitals	AS/NZS 3009:1998
The Storage and Handling of flammable and Combustible Liquids	AS 1940:2017
Structural Design Actions – Earthquake Actions in Australia	AS 1170.4-2018 Amd 2
Installation and Safety Requirements for Photovoltaic (PV) Arrays	AS/NZS 5033:2021
Grid Connection of Energy Systems via Inverters Series	AS/NZS 4777
Lightning Protection	AS 1768:2021
Electric Vehicle Conductive Charging System	IEC 61851-1:2017
Interior Lighting – Safe Movement	AS/NZS 1680.0:2009
Interior and Workplace Lighting – Circulation Spaces	AS/NZS 1680.2.1:2008
Interior and Workplace Lighting – Office and screen-based tasks	AS/NZS 1680.2.2:2008

	Interior and Workplace Lighting – Educational and Training Facilities	AS/NZS 1680.2.3:2008
	Interior and Workplace Lighting – Industrial Tasks and Processes	AS/NZS 1680.2.4:2017
	Interior and Workplace Lighting – Hospital and Medical Tasks	AS/NZS 1680.2.5:2018
	Emergency Lighting and Exit Signs for Buildings – System Design, Installation and Operation	AS/NZS 2293.1:2018
	Lighting for Road and Public Spaces – Pedestrian Area (Category P) lighting	AS/NZS 1158.3.1: 2020
	Control of the Obtrusive Effects of Outdoor Lighting	AS/NZS 4282:2023
	Telecommunications Installations – Telecommunications Pathways and Spaces for Commercial Buildings	AS/NZS 3084:2017
	Information technology - Generic cabling for customer premises – General requirements.	AS/NZS 11801.1:2019
	Requirements For Customer Cabling Products	AS/CA S008:2020
	Installation Requirements for Customer Cabling (Wiring Rules)	AS/CA S009:2020
	Hard-wired patient Alarm Systems	AS 3811:1998
	Security for Healthcare Facilities	AS 4485.1:2021
	Intruder Alarm System – Client's Premises – Design, Installation, Commissioning and Maintenance	AS/NZS 2201:2007
Authorities		
	National Construction Code (NCC)	2022
	NSW Service and Installation Rules	
	Fire & Rescue NSW	
	Ausgrid Network Standards	
	Clean Energy Council	
	Telstra and NBN Design Guidelines and Standards	
	Mobile Carrier Forum	
Client's Standards		
	NSW Health Infrastructure Engineering Services Guidelines (ESG)	December 2022
	NSW Health ICT Cabling Standard	Rev 4
	NSW Health ICT Room Standard	Rev 1
	NSW Health Wi-Fi Standard	
	NSW Health Protecting People and Property	February 2022
	NSW Health Infrastructure Design Guidance Notes Suite	
	Australasian Health Facilities Guidelines Suite of Documents	

1.6 TOWN PLANNING DELIVERABLE REQUIREMENT

Below is a summary of the town planning deliverable requirements and a reference to the relevant section of this report.

Table 1 – Town Planning Deliverables

Deliverable	Relevant Section of Report
Lighting Assessment ▪ Lighting Assessment	Section 3.7 Appendix B – Electrical Site Plans and Targeted External Light Lux Levels Appendix C – Preliminary External Lighting Calculations
Services Design Statement ▪ Describe the relevant services design statements (what is proposed, why it is needed, capacities available or needed, connections needed, consultation with service providers, broader headworks, confirm Australian Standards to be complied with, any mitigation measures needed).	Sections 2, 3 and 4 Appendix A – Latest JHA ASP Level 3 Design Documentation packageAppendix A –
Infrastructure Design Plans (concept level) For any utility works to be undertaken, including: ▪ Telecommunications; ▪ Sewer; ▪ Water; ▪ Gas; ▪ Electrical.	Appendix B – Electrical Site Plans and Targeted External Light Lux Levels

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 with formal discussions with respective utilities.
    a. Ausgrid has confirmed that adequate capacity is available in the existing HV feeder to upgrade the existing substation to serve the proposed scope of works.
    b. A new incoming telecommunications provider service (NBN lead-in) is proposed from Jurd Street
2. The Campus is a Low Voltage (LV) customer. Ausgrid owns and maintains the kiosk substations and HV infrastructure.
3. Diversions of the existing private electrical and communications infrastructure will take place with the objective of minimising disruptions to the hospital's normal operation.

1.7 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 EXISTING ELECTRICAL INFRASTRUCTURE AND CONNECTIONS

2.1 ELECTRICAL SERVICES

2.1.1 KIOSK SUBSTATION

The site is served by the Ausgrid network via an 800kVA kiosk substation fed from a single spur HV feeder on Foster St. However, it is located within the demolition zone for the New Build. Therefore, a new power supply strategy will need to be put in place at an early stage of the project. Consideration will be undertaken to minimise the disruption to the hospital via a detailed staging plan.

An Application for Connection (AFC) was lodged to Ausgrid to nominate the power strategy for this development in the previous scheme, which the client accepted in May 2023. At the time of this report, the JHA ASP3 team issued the Proposed Design Scope (PDS) package for Ausgrid to review, and they forwarded the Design Information Package (DIP)87 outlining the minimum requirements for the Ausgrid network augmentation works.

Also, two buildings out of scope are connected separately to the Ausgrid LV network via 1x100A street supplies (1x per building), which these works may not affect. However, the LV supply of Cessnock House is adjacent to the proposed location of the substation, so, it is likely that this will need to be consolidated. Ausgrid shall confirm during the AFC process if the supplies need to be consolidated into one.

2.1.2 SITE MAIN SWITCHBOARD AND MAJOR DISTRIBUTION BOARDS

The existing Main Switch Board (MSB) and major electrical infrastructure (2x Gensets serving the Kitchen building and general L&P across the campus and major MDBs) are located at the northern end of the site. As the footprint of the building does not overlap greatly with the buildings housing the major electrical infrastructure, it is expected that the impact on the power supply will be reduced.

It can be highlighted that the western end of the existing Engineering Building houses the Genset serving the Kitchen, and it is part of the cabling reticulation pathway to the kitchen. As this portion of the building will be demolished for a new landscape area as part of these works, it is envisaged that an alternative power supply pathway will need to be coordinated from the existing Main Hospital building to keep the operation of the Kitchen and Oral Health buildings.

Careful planning and coordination will take place in order to reduce the impact on the normal operation of the hospital during the construction works.

2.2 COMMUNICATION SERVICES

2.2.1 CARRIER LEAD-IN SERVICES AND PABX ROOM

The site has a hard-wired connection to the Telstra network infrastructure (copper and fibre) from View St to the PABX room, which also acts as a Campus Distributor. It is located south of the campus, away from the demolition zones.

However, the PABX room does not meet the latest NSW Health ICT guidelines, and it is not proposed to be upgraded.

Also, the campus houses a Microwave Dish antenna on the roof of the existing Main Building that provides HWAN services to the campus.

It is understood that a new NBN Fibre lead-in service will be temporarily run by NBN in coordination with the HNELHD ICT team, which can be reutilised for the New Build. Further discussions with the HNELHD ICT and NBN teams will be conducted in the next stage.

2.2.2 DATA & VOICE BACKBONE INFRASTRUCTURE

The campus presents a Star/radial configuration centred in the existing PABX room. Hence, almost every building houses a communication rack acting as a Building Distributor (BD) with fibre and copper links back to the PABX room. However, the fibre and copper of some of the out-of-scoped buildings traverse demolition zones to give space for the New Build. Hence, new in-ground pathways will need to be built prior to commencing the demolition works.

During the feasibility stage, a site-wide in-ground survey was conducted, revealing in-ground communications links between buildings that differ from the as-built and labelling information found on site. Hence, as part of the next stage, a communications audit may need to be undertaken, and further discussions with the HNELHD ICT team will take place to identify and verify the status of these inter-building connections.

2.2.3 SECURITY SERVICES

The existing Inner Range Integriti security head-end is housed in the PABX room. Security Data Gathering panels across most buildings equipped with electronic access control are linked to the head-end via the LHD ICT network.

The existing CCTV system is analogue, and its coverage is limited to the ED, main entries, and car park areas. An out-of-scope building has a stand-alone CCTV system that provides perimeter and public space coverage.

An upgrade of the CCTV system to an IP-based one is proposed for the New Build. However, the CCTV systems located in the existing buildings will be retained.

3 PROPOSED ELECTRICAL INFRASTRUCTURE

3.1 OVERVIEW

Proposed key Electrical Infrastructure Works associated with the new development are as follows:

- New Ausgrid-owned 1,000kVA kiosk substation to replace the existing 800kVA kiosk substation
- New Main Switch Board (MSB) room, housing a new MSB to be fed from the New Kiosk Substation and serve the existing campus and New Building
- New Main Distribution Board (MDB) room within the New Building, housing a new MDB to serve the power requirements of the New Building and new external areas
- New Standby Diesel Generator on the roof of the New Build to serve the critical electrical loads as per the NSW Health Engineering Services Guidelines (ESG), AS/NZS 3009 and other codes and standards
- New Photo-Voltaic (PV) system on the roof of the New Build
- New exterior lighting to serve the internal roads, pathways and carparks
- New 10x 22kW Electric Vehicle Charging Stations (EVCS) dedicated to the NSW Health EV fleet installed from Day 1 with an active load management system plus future provisions in the Electrical Distribution Board (EDB) for 10x additional 22kW EVCS
- Diversion of power supply of existing buildings such as the Kitchen and Mortuary due to the pathway of the sub-main cabling reticulation is within the demolition zones

3.2 KIOSK SUBSTATION

It is proposed that the existing 800 kVA kiosk substation, which is located within the demolition zone, be upgraded to a new 1,000kVA kiosk substation to serve the following areas:

- New Build
- Existing Main Hospital building and associated smaller buildings

It is noted that most of the Main Hospital building will be left vacant. Hence, the power supply allowance to the vacant spaces will be kept at a minimum for life service loads such as dry/wet fire and emergency lighting.

The Cessnock Community Health Building (Drug & Alcohol) and Cessnock House (Pathology) have dedicated stand-alone Ausgrid LV power supply from View Street and Foster Street respectively, which will be retained.

As the hospital is an LV customer, the new kiosk substation and the High Voltage Infrastructure are owned, maintained and operated by Ausgrid. However, the project funds these network augmentation works.

Below is a list of key items related to the substation upgrade:

- New 1,000kVA kiosk substation to be located at the east of the campus, with direct vehicle access from Foster Street, within the hospital property boundary.
- The existing overhead-to-underground HV service point on Ausgrid Pole FS-82137, located south-west of Cessnock House (11 Foster St) is to be retained and used as a connection point for the new kiosk substation
- The existing 800kVA kiosk will be disconnected and decommissioned once the new kiosk substation is operational.
- The existing easement over the in-ground HV service and existing substation will be adjusted to cover the new kiosk substation location in accordance with Ausgrid requirements. A 4.5m-wide 24/7 right-of-way access on Foster Street into the hospital property boundary will be established following Ausgrid requirements for heavy vehicle movement to the substation.
- A transformer handling area in front of the equipment areas will be provided. Methods similar to utility requirements are to be employed, including using a Franna crane to move large equipment in and out of the substation areas.
- The new kiosk substation is to conform to Ausgrid Network Standards, NSW Service Installation Rules, AS/NZS 3000 and other relevant codes and standards to minimise fire risk and segregation requirements.
- The substations will be naturally ventilated through an integral housing supplied by the manufacturer. The substation's cooling systems shall be specified so that continuous supply at transformer maximum capacity is achievable 24/7, 365 days per year.
- Space provision for a future kiosk substation is considered as part of these works. However, the future kiosk substation will be required as part of the future stages.

Refer to Figure 2 for the kiosk substation detail and Figure 3 for the proposed location of the kiosk substation and Main Switch Board (MSB) room, and

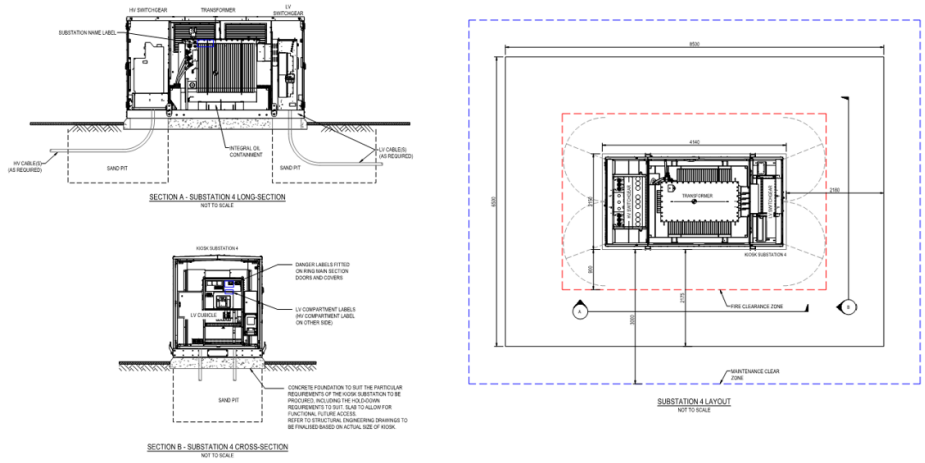


Figure 2 – Kiosk Substation Detail

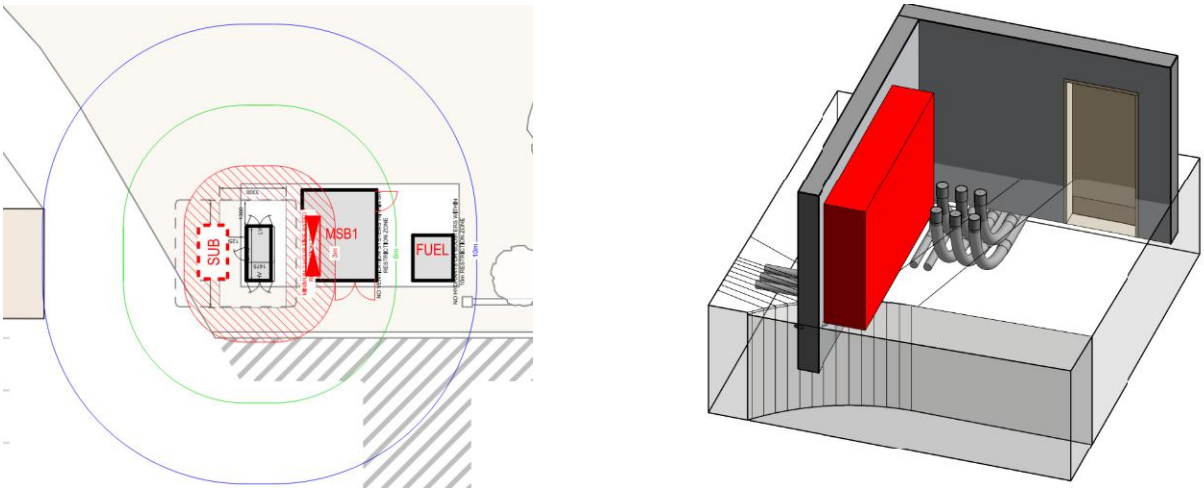


Figure 3 – Proposed location of Main Switchboard Room (and 3D detail), Kiosk Substation and Fuel Bulk Tank layout.

3.3 MAIN SWITCH BOARD (MSB)

It is proposed to establish a new Main Switch Board (MSB) Room with 1x Main Switch Board No1 (MSB1) and space provisions for a second MSB No2 (MSB2) for the future expansion. This room is to be located externally to the New Build, and adjacent to the 1x1,000kVA kiosk substation at the east of the campus and with access to Foster Street to comply with the NSW Service and Installation Rules requirements.

The MSB Room is proposed to have the following internal dimensions: 4.5m (W) x 3.7m (D) x 3m (H). This room will be fire-rated for at least 2 hours with smoke-sealed doors, non-combustible internal linen and two diverse egress pathways as per NCC & AS/NZS 3000 requirements. Additional space within the room is considered for future installation of a combined Active Harmonic Filter/ Power Factor Unit as per the NSW Health Engineering Services Guidelines (ESG).

It is proposed that the existing MSB (exMSB) serving the Main Hospital Building and the rest of the campus be retained, and this will be connected to the new MSB1. The existing authority energy metering will be relocated from the existing MSB room to the new MSB room.

The existing Authority Meter serving the exMSB will be relocated to be connected to the new MSB1. A private meter will be placed in series with the Energy Provider meter and will be provided with a high-level interface to the BMS to allow for monitoring and recording of the maximum & average values of the below items in accordance with NCC 2022 Section J8 requirements:

- kWh,
- kVA,
- current,
- voltage,
- power factor and THD

Refer to the Figure 3 for the location of the MSB Room and kiosk substation.

3.4 MAIN DISTRIBUTION BOARD (MDB)

The New Build will be equipped with a new Main Distribution Board (MDB) Room on the Ground Floor, which will act as a "Main Switchboard" for the New Build and house the following equipment

- 1x Main Distribution Board (MDB)
- 1x Diesel Generator Main Distribution Board (Gen-MDB)
- 1x Diesel Generator Auxiliary Services EDB
- 1x Essential and 1x Non-Essential Electrical Distribution Boards (EDBs) to serve the central fire compartment of the New Build

Refer to Figure 4 for the proposed layout for the MDB Room.

It is proposed that the MDR will have the following dimensions: 8 (L) x 4 (W) x 3.2(H) m and be min. 2h fire-rated with smoke-sealed doors, non-combustible internal linen and two diverse egress pathways as per NCC & AS/NZS 3000 requirements. No wet services are to traverse or located over the MDR.

The MDB will be supplied with private meters in accordance with the NCC Section J8 requirements and will be provided with a high-level interface to the BMS to allow for monitoring and recording of the maximum & average values of:

- kWh,
- kVA,
- current,
- voltage,
- power factor and THD

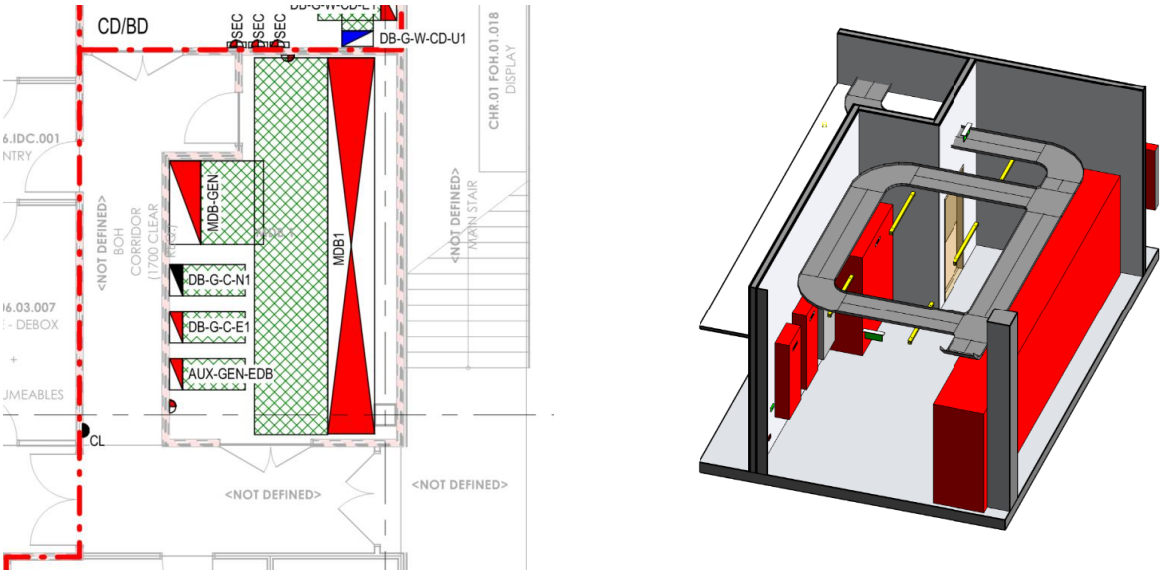


Figure 4 – Proposed location of the MDB room (and 3D detail) on the Ground Floor of the New Build

3.5 STANDBY DIESEL GENERATOR AND FUEL DELIVERY SYSTEM

A standby diesel generator within a dedicated room is proposed to serve the New Build. As per the NSW Health ESG and based on the maximum demand of the building and its purpose (non-post-disaster facility), the proposed generator size is 400kVA.

Due to spatial planning issues and limited space on the lower levels, the diesel generator room will be located in the central open area of the Roof Plant. This location also facilitates compliance with the ventilation requirements (air intake, exhaust and hot air discharge), which would require considerable plant room space if the generator were located on the lower level.

For spatial purposes, it is proposed that the Diesel Generator is to be in an acoustic enclosure and equipped with an internal fuel tank (approx. 360L), intake and exhaust attenuators and control equipment. This genset will have the following dimensions: 5.1m (L) x 1.6m (W) x 2.4(H) m, requiring a 1.5m clearance around the enclosure for maintenance and ventilation purposes. Given its location is above the proposed IPU ward, a noise and vibration study will be required in the next stage to guarantee that the operation of the diesel generator will have a minimal impact on the adjacent areas at the level below.

Note that the following general principles (as stated in the ESGs) are applied to determine the backup power requirements:

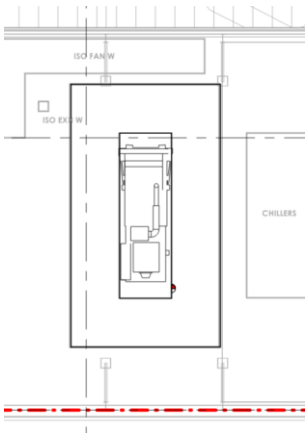
- All life and safety requirements as required by the NCC
- All ICT communications rooms' active and passive equipment, including ICT/Medical UPS
- Medical air and suction equipment,
- Approximately 30% of general lighting and power in all areas. This value will vary depending on the number of light fittings and power outlets used in any particular room and to follow the Table 5 of the NSW Health ESG
- Full lighting and power in critical areas, including the Emergency Department and Operating Theatres. All air-handling fans and exhaust fans serving these areas are also included.
- All air handling and exhaust fans serving isolation rooms.
- Selected imaging areas required for emergency departments only
- Critical storage such as -80°C fridges and blood fridges
- Sewage pumping stations
- Domestic Hot Water (DHW) and Cold Water Pumps (CWP) systems
- Emergency Lighting System

A dedicated Generator Main Distribution Board (Gen MDB) will be provided within the MDB Room to split and distribute the power supply to the MDB via separate sub-main cabling to each ATS within the Life Safety and Essential busbars. Once the loads from the other trades are available and discussions with the LHD take place to establish the priority of such loads, the addition of motorised circuit breakers might be required.

The generator will be equipped with its own internal fuel tank, which in turn will be fed from a new on-grade double-wall bulk fuel tank located on the east end of the campus, adjacent to the MSR. This bulk fuel storage will be sized for 24 hours of continuous full-load operations of the Genset as per the NSW Health ESG requirements, approx. 2,000L of capacity. Also, this bulk tank will be equipped with a duty/standby dual fuel pump system, a fuel fill point, a vent pipe, a filtration system, and a monitoring and alarm annunciation system. Refer to the Figure 3 for further details.

A fuel pipe riser will be located close to the eastern stairwell core to provide the shortest distance to the Diesel Generator.

As per NSW Health ESG requirements, a Generator Link Box (GLB) will be provided to connect a portable diesel generator in case the on-site diesel generator fails during a power outage. This GBL will be rated and limited at 630A/ph, which is the rating of the on-site diesel generator. The link box will be located externally to the New Build on the southeast corner of the building, with direct vehicle access to the Ambulance Bays and Jurd St.



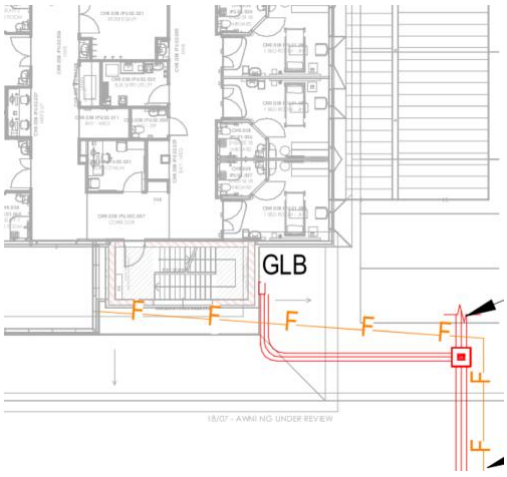


Figure 5 – Proposed Diesel Genset and Generator Link Box locations.

3.6 PHOTO-VOLTAIC (PV) SYSTEM

It is proposed that a new PV system be installed on the roof of the New Build. At this stage, the project team designs and provides for the installation of a system in the order of 220kW nominal capacity. Refer to the Figure 6 for the proposed PV layout

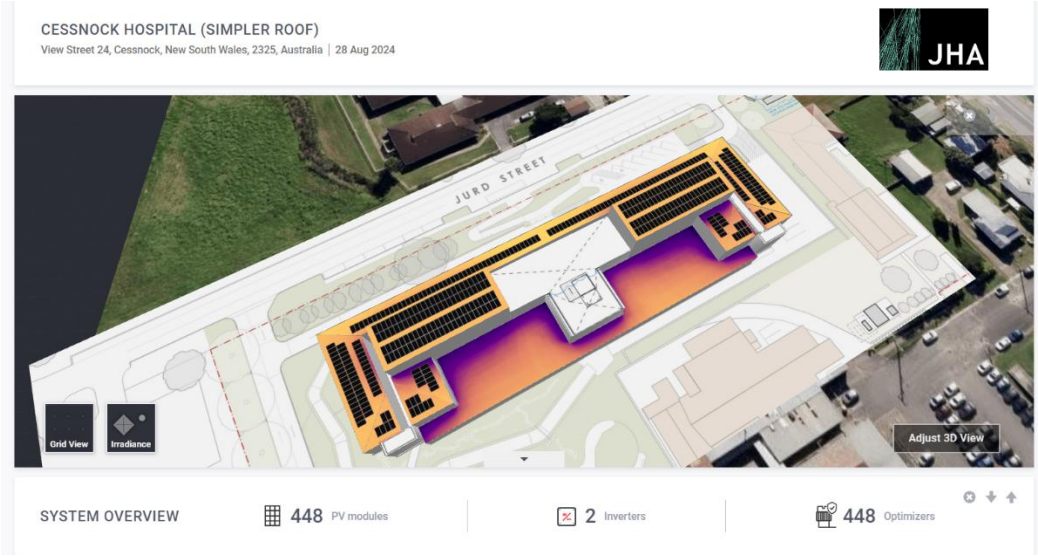


Figure 6 – Proposed PV layout.

3.7 EXTERIOR LIGHTING

Exterior lighting will be provided in accordance with NSW Health's policy manual, Protecting People and Property (NSW PP&P), as well as compliance with AS/NZS 1158.3.1, AS/NZS 4282 and AS4485.1.

Lighting designs will achieve recommended light levels for safety and security while allowing CCTV surveillance to function fully. Lighting control systems shall be IP-based and readily interface with the site BMS for timing, switching, control, monitoring, etc.

Automation and control of the lights across each area are important to ensure a seamless appearance. Lights are to be time-switched controlled in combination with photoelectric cells. It is assumed that a common time clock philosophy will be utilised across all campus buildings to ensure that lights are activated simultaneously, 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 by utilising time clock override where desired.

All external lighting will be connected to the generator supply in compliance with NSW PP&P. All external light fittings must be LEDs with a colour temperature of 3,000K, IP65 & IK08, and a minimum CRI80+.

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. Refer to Appendix D - Mitigation Measures for further details.

Please refer to the Table 2 for a brief description of the lighting strategy per area:

Table 2 – Proposed lighting strategy per area.

Area	Proposed Lighting Strategy
Western Carpark	To minimise the light spill to the adjacent residential neighbours, use 8m-height light poles in the perimeter of the carpark with block glare shields. Also, each light fixture will be dimmable and equipped with a motion sensor. Between 12 a.m. and dusk, the light fixtures will be dimmed down to 50% of their capacity and only dimmed up for 30 minutes by activation of the motion

	sensor. This will reduce the light pollution in the carpark and adjacent areas and activate only when needed.
New Internal Roads	To reduce costs, wall-mounted floodlights on the northern façade of the building are proposed to take advantage of the building's structure. These will be vertically adjustable to minimise potential light spill to the northern residential neighbours and the hospital building. In other instances, 6-m light poles will be provided. Similarly to the Western Carpark, each light fixture will be dimmable and equipped with a motion sensor to utilise the entire output of the fixtures when movement is detected.
Ambulance Bay	A combination of wall-mounted floodlights and ceiling-recessed downlights is proposed to contain the lighting output to the undercover ambulance bays and serve the adjacent ambulance driveway connecting with Jurd Street. The wall-mounted floodlights will be dimmable and controlled by motion sensors. The downlights will be on/off type due to the importance of keeping the patient transport area (between the entry doors of the ED and the rear of the ambulance bays) as per AS/NZS 1680.2.5
Main Entries and high-traffic footpaths	To comply with the enhanced lux levels denoted in AS4485.1, it is proposed that ceiling-recessed downlights be used in the Main Entry, ED entries, and the covered perimeter of the building between these entries, where high pedestrian movements are expected. Also, the main footpaths between the Western Carpark and the New Build will be provided with 4m-height featured light poles, focusing on blending with the landscape but maintaining their function of serving these areas expected to be used by staff and patients driving to the site.
Low-traffic footpaths and landscape areas	It is understood that visitors and staff will use the landscape areas to the southwest of the New Build for lunch and recreation in the daytime. Therefore, it is proposed that the targeted lux levels for these low-traffic footpaths are lower than the ones mentioned above. A combination of 4m-height feature light poles and 1m-height light bollards is proposed around the footpaths circling the landscape areas.
Existing Eastern Carpark	As the works related to this existing carpark are minimum to none, it is not proposed to upgrade the existing external lighting for this area.

Refer to **Appendix B – Electrical Site Plans and Targeted External Light Lux Levels** for the proposed site plans showing the indicative location of the external lighting fixtures and the proposed lux levels to be targeted per area and to **Appendix C – Preliminary External Lighting Calculations** for the preliminary lighting calculations showing compliance with the lux level requirements noted in Appendix B.

3.8 ELECTRIC VEHICLE CHARGING STATIONS (EVCS) SYSTEM

As part of the ESD Initiatives and following the DGN046, the installation of 10x 22kW 1Ph EV Charging Stations (EVCS) in the on-grade carpark has been proposed. These stations will be dedicated to the NSW Health EV fleet.

As part of the strategy of utilising 1x1,000kVA kiosk substations to serve the New Build and existing campus, it is proposed that an Active Load Management System (ALMS) be implemented. This system will monitor the electrical load of the MSB in real time and cap the output of the EVCS if this load reaches a set threshold.

This approach translates to the risk of the vehicles not being fully charged. However, discussions with the HNELHD and other stakeholders have revealed that the fleet vehicles are mainly used during business hours, and the EV will be left charging overnight when the campus's electrical demand is expected to be reduced at its lowest.

Also, it is important to outline that the Electrical Distribution Board for EV (EVDB) proposed to serve the EVCS will be sized to accommodate 10x 22kW additional EVCS in the future by the HNELHD. However, the overall output of the system will still be capped so that the substation's capacity is not exceeded.

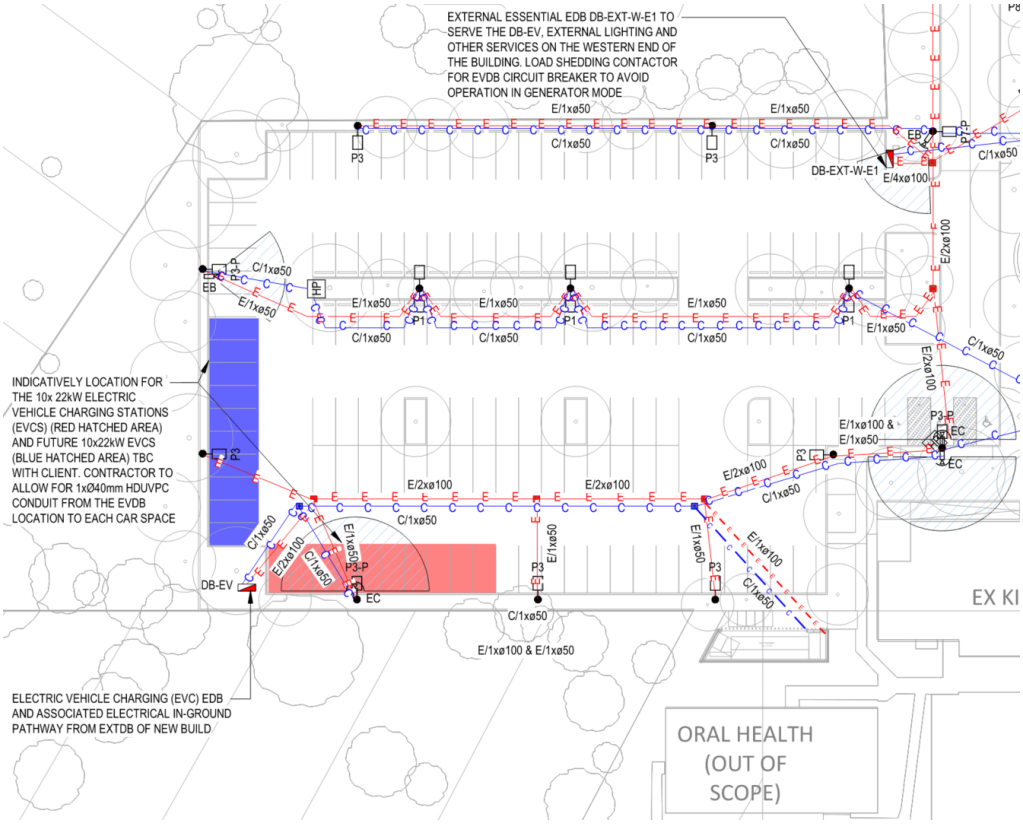


Figure 7 – Proposed location of the EV Charging Stations and EVDB.

3.9 DIVERSION OF POWER SUPPLY TO KITCHEN AND MORTUARY BUILDINGS

It has been identified that the existing sub-main cabling reticulation of the Kitchen and Mortuary buildings traverse the demolition zones.

Discussions with the HNELHD Engineering team and the PM were undertaken onsite to assess the most cost-effective option for sourcing the alternative power supply and pathway through existing buildings to minimise the disruption to hospital operations.

- For the Kitchen, new essential and non-essential power supplies will be sourced from the existing MDB2 within the Main Hospital building. The cabling reticulation pathway will be done via a combination of ceiling void and the roof of the Main Hospital Building
- The use of the mortuary (currently fed via a non-essential supply) will be temporary until the New Building is completed, as this will be equipped with a new Mortuary department. Hence, it is proposed to source the non-essential power supply from the adjacent Kitchen Building via an existing concrete trench between them.

Refer to the Appendix B – Electrical Site Plans and Targeted External Light Lux Levels for further details.

4 PROPOSED COMMUNICATIONS INFRASTRUCTURE

4.1 OVERVIEW

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

- New NBN lead-in in-ground service from Jurd Street to the New Build to create a diverse pathway – Primary NBN lead-in to the existing PABX room within the existing Main Hospital Building from View Street.
- 1-off new Campus Distributor (CD) located on the Ground Floor of the New Building. To also serve as a primary Building Distributor (BD)
- 4-off Floor Distributors (FDs) distributed by 2x FDs per level. 1-off FD to also serve as a secondary BD
- New In-building Mobile Coverage/Distributed Antenna System (DAS) room located on the roof of the New Build
- 48 core SMOF fibre optic backbone interfaces via fully diverse paths from the new CD to the existing PABX room within the existing Main Hospital Building
- 24 core SMOF fibre optic backbone interfaces between each BD and each FD via diverse pathways.
- New Security and CCTV systems within the New Build to also serve the new external areas.
- New Nurse call system to be located within the clinical spaces of the New Build.
- Diversion of existing optic fibre and copper links between the PABX room and Cessnock House is considered due to part of the existing pathway being within the demolition zone. Refer to Appendix B – Electrical Site Plans and Targeted External Light Lux LevelsError! Reference source not found. for further details.

4.2 INCOMING TELECOMMUNICATIONS SERVICES

A new NBN lead-in is proposed from Jurd St to the DAS/Carrier Room in the New Build to provide a diverse carrier connection pathway to the campus. During the feasibility stage, JHA lodged an application with NBN, which was, in principle, found acceptable by NBN.

Recent discussions with the HNELHD ICT team and the client revealed that the LHD is conducting a separate project to upgrade the NBN lead-in service. However, at the time of writing this report, the proposed pathway by NBN as part of the LHD project is unclear, but it is intended that this lead-in service connection is temporary and will be reused for the New Build.

The contractor will continue to liaise with NBN and the HNELHD ICT team on the next steps in the following stage.

Refer to Appendix B – Electrical Site Plans and Targeted External Light Lux Levels for further information about the existing and proposed NBN lead-in pathways.

4.3 DATA AND VOICE CABLING BACKBONE

The New Build will be equipped with a combined Campus/Building Distributor (CD/BD1) on the Ground Floor, a combined Building/Floor Distributor (BD2/FD) on Level 1, 2x Floor Distributors (FD) on the Ground Floor, and 1x FD on Level 1. These rooms will have the following characteristics:

- The CD/BD1 will be located centrally on the Ground Floor of the building. The proposed size of this room is a minimum of 6m (L) x 5m (W) to house up to 7x Communications Racks.
- The BD2/FD will be located on the eastern wing of the Level 1. The proposed size of this room will be a minimum of 3.3m (L) x 3.4m (W) m to house 3x communications racks
- 2-off FD for the Ground Floor and 1x FD for Level 1 West to serve an area of up to 2,000m2 each. The proposed size of each room will be a minimum of 3.3m (L) x 3.4m (W) m to house 3x communications racks

New copper and optic fibre backbone cabling links will be provided from the new CD/BD1 to the new BD2/FD existing PABX room via diverse pathways in line with the NSW Health ICT Cabling Standards. In the next stage, these pathways will be further refined and coordinated with the HNELHD ICT team. Also, each FD will be linked with the CD/BD1 and BD/FD via copper and optic fibre backbone cabling.

Further discussions with the HNELHD ICT team will be held in terms of connecting the PABX room with the new CD building and enabling the use of the existing legacy copper lines with the proposed VoIP system.

Refer to the Figure 8 and Figure 9 below for the proposed locations of the CD/BD and FDs within the New Build:

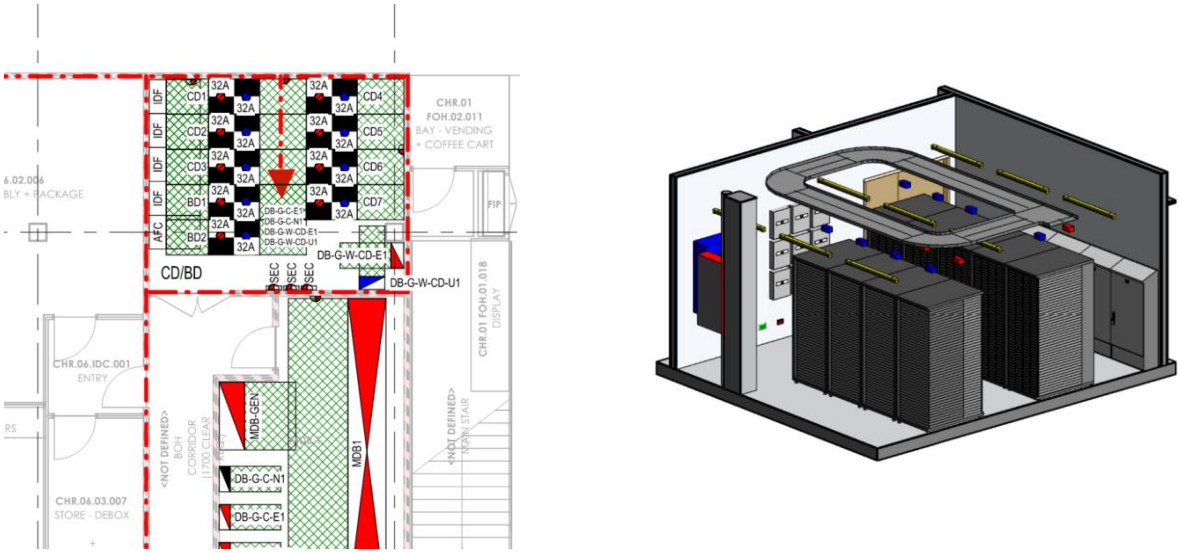


Figure 8 – Proposed location of the new CD/BD (and 3D render) within the New Build

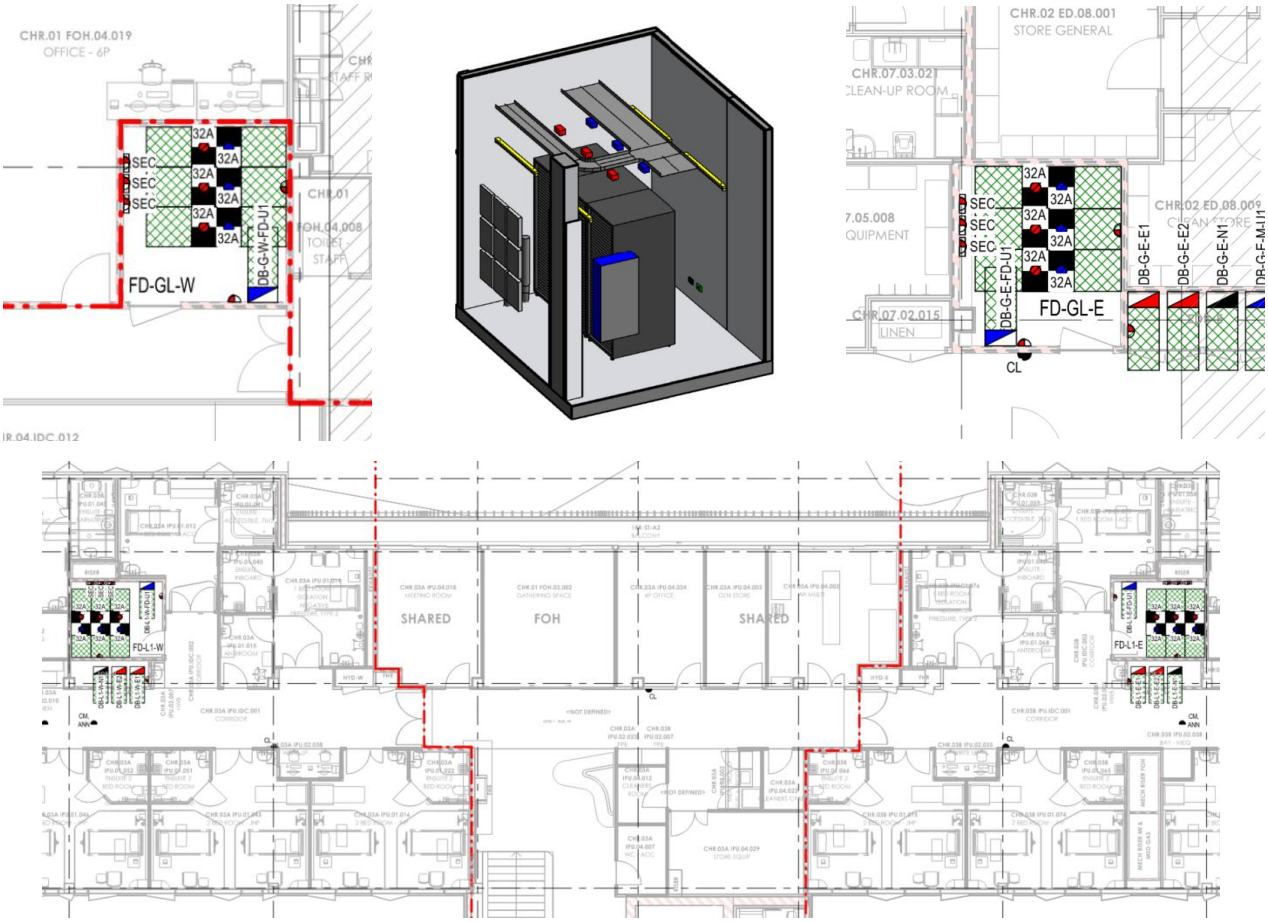


Figure 9 – Proposed location of the new 2x FDs on GF and typical 3D render (top) and 2x FDs on L1 (bottom) within the New Build

It is noted that there was an updated version of the NSW Health ICT Cabling Standard released on 19/07/2024, and the HNELHD ICT has requested the implementation of this standard in this project. One of the items that has proven difficult to achieve at this stage due to the late introduction of this update and the progress of the health planning is related to the increase of clearance in front and rear of the communication racks from 900mm to 1200mm. However, the architect confirmed that the increase in the size of the communications rooms is feasible.

Hence, it has been agreed with the HNELHD, PM, Architect and other stakeholders that this item will be revised with the awarded contractors in the next stage.

4.4 DISTRIBUTED ANTENNA SYSTEM (DAS)

The New Build will be equipped with a DAS system throughout the building based on the MFC 2018 standard with 5G capabilities.

JHA prepared a preliminary Cellular Reception Management report, which presented different solutions to the HNELHD ICT team for discussion with their lead carrier (Telstra). At the time of writing this report, Telstra has yet to confirm what DAS solution is feasible for this project.

However, for spatial purposes, JHA allowed the inclusion of a DAS/Carrier room located on the roof plant of the New Build. The room's minimal internal dimensions are 8m (W) x 4.5m (D) and, based on the MCF2018, to house up to 6x communications racks per carrier, plus 2x communications racks for neutral equipment, which is the worst-case scenario in terms of spatial requirements. A separate generator-backed EDB is allowed in this room.

Refer to the Figure 10 for the proposed location of the DAS/Carrier room:

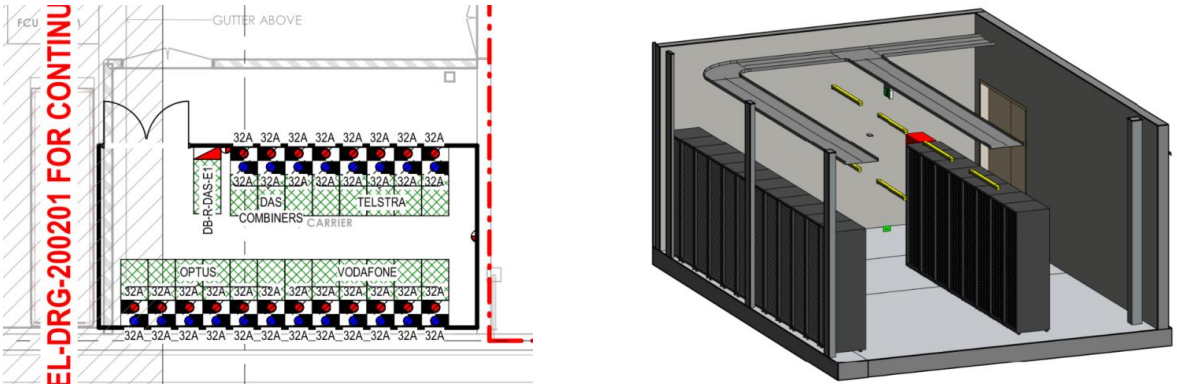


Figure 10 – Proposed location of the new DAS/Carrier Room within the New Build

5 CONCLUSION

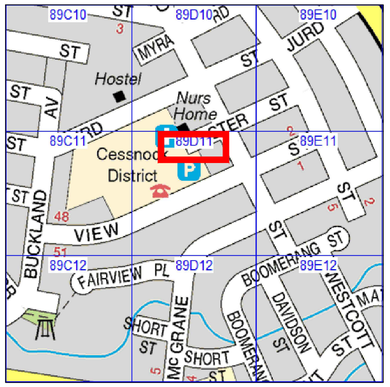
Existing and new electrical infrastructure proposed to support the new development has been assessed as adequate, with consideration to the following:

1. Assessment of existing utility infrastructure and assets has been undertaken in parallel with formal discussions with respective utilities.
    a. Ausgrid has confirmed that adequate capacity is available in the existing HV feeder to upgrade the existing substation to serve the proposed scope of works.
    b. A new incoming telecommunications provider service (NBN lead-in) is proposed from Jurd Street
2. The Campus is a Low Voltage (LV) customer. Ausgrid owns and maintains the kiosk substations and HV infrastructure.
3. Diversions of the existing private electrical and communications infrastructure will be undertaken at an early stage to minimise disruptions to the hospital's regular operations.

Similarly, the design intent related to the external lighting is found acceptable, focusing on the following items:

1. The placement of the light fixtures has been considered to comply with the enhanced lux levels denoted in the AS4485.1 for security in healthcare facilities but keeping in mind the impact on the buildings and neighbours.
2. Provision of an intelligent lighting control system with DALI dimmable light fixtures to provide flexibility in terms of control of the intensity (dimming) and operation of the external light fixtures based on a combination of the use of photo-electric cells and timeclock, with an override lighting control panel within the building
3. To minimise light spill, additional lighting control devices, such as dedicated motion sensors and back glare shields per light fixture, are introduced to key areas within the campus adjacent to residential properties. This will allow for an extra layer of control of these light fixtures to provide their maximum output when needed while maintaining compliant lux levels when no presence is detected.

APPENDIX A – LATEST JHA ASP LEVEL 3 DESIGN DOCUMENTATION PACKAGE



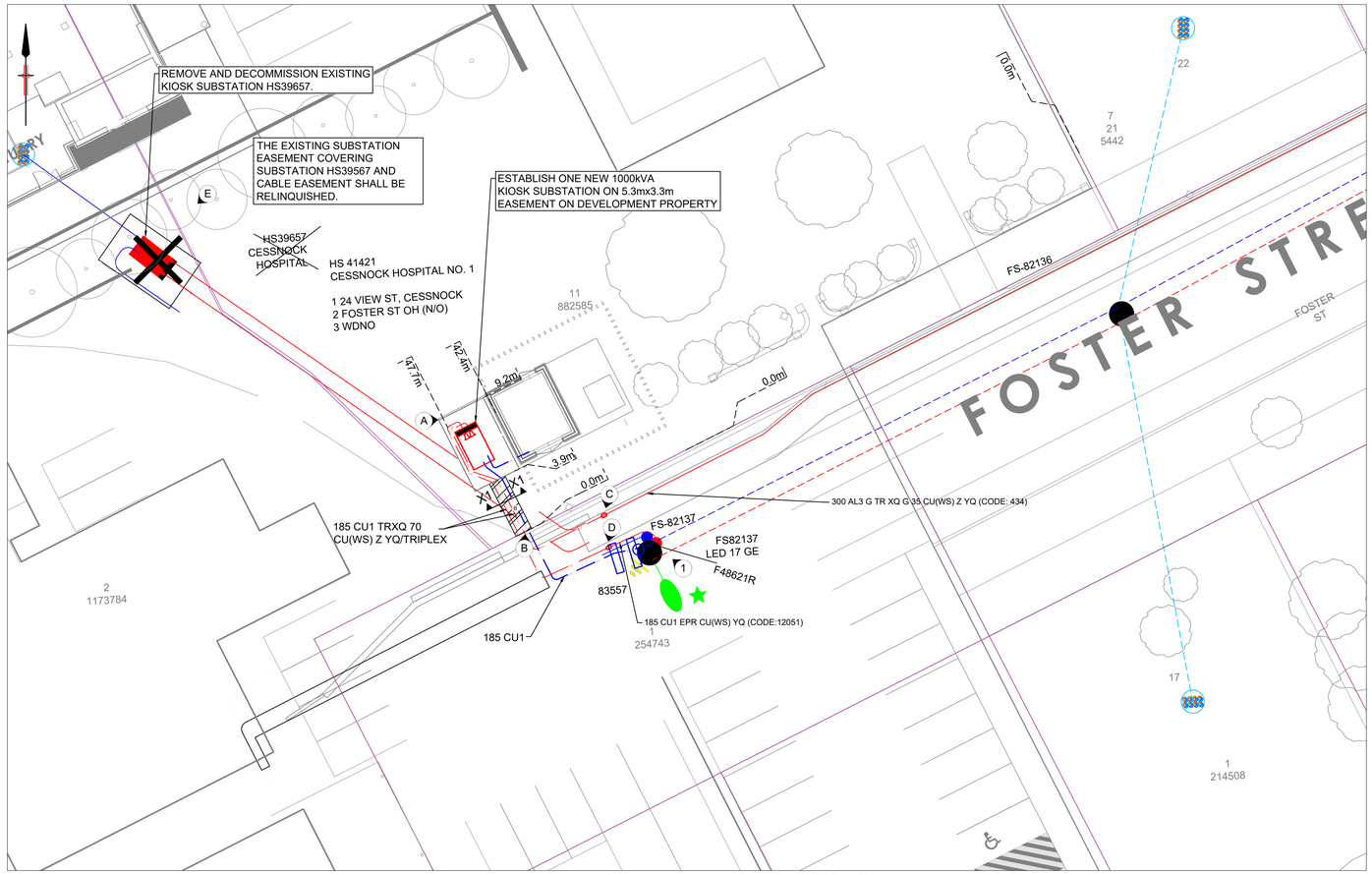
GEOGRAPHICAL LOCATION

NOT TO SCALE
UBD MAP: 89D11

GENERAL

- CLAIMS FOR VARIATIONS TO THE COST OF NON-CONTESTABLE WORKS, INCLUDING ROCK EXCAVATION, WILL NOT BE ACCEPTED UNLESS VERIFIED ON SITE BY AUSGRID WHILE THE WORKS ARE IN PROGRESS.
- THE ASP/1 IS RESPONSIBLE FOR UNDERTAKING SATISFACTORY CONSULTATION WITH ALL LOCAL CUSTOMERS WHO MAY POTENTIALLY BE AFFECTED BY THE CONSTRUCTION WORKS INCLUDING ALL ALTERATIONS TO SERVICE MAINS.
- THE ASP/1 MUST MINIMISE THE IMPACT OF THE WORKS ON THE ELECTRICITY SUPPLY TO CUSTOMERS AND INTERRUPTIONS TO SUPPLY MUST BE AVOIDED WHEREVER POSSIBLE. AT LEAST FOUR (4) CLEAR BUSINESS DAYS NOTICE MUST BE PROVIDED TO ALL AFFECTED CUSTOMERS PRIOR TO ANY PLANNED INTERRUPTIONS TO THE ELECTRICITY SUPPLY. NOTICE MUST BE IN WRITING IN ACCORDANCE WITH CLAUSE 90 OF THE NATIONAL ENERGY RETAIL RULES.
- SPECIFIC PRIOR APPROVAL MUST BE SOUGHT FROM AUSGRID FOR ANY PLANNED ELECTRICITY SUPPLY INTERRUPTIONS WHERE THE PLANNED INTERRUPTION WILL EXCEED ONE (1) HOUR IN DURATION OR THE DURATION WILL BE LESS THAN ONE HOUR WHERE A SUITABLE TIME FOR THE INTERRUPTION CANNOT BE MUTUALLY AGREED TO WITH THE AFFECTED CUSTOMER(S).
- THE ASP/1 IS TO MAINTAIN ADEQUATE PUBLIC LIGHTING LEVELS FOR THE DURATION OF THE WORKS. IF NECESSARY, THE ASP/1 IS TO ARRANGE FOR SUITABLE TEMPORARY STREET LIGHTING TO BE PROVIDED UNTIL PERMANENT LIGHTING IS RE-ESTABLISHED.
- FOR KIOSK AND CHAMBER TYPE SUBSTATIONS IN THE HUNTER AREAS, ARRANGE PHASING OF 11KV AND LOW VOLTAGE TRANSFORMER TERMINATIONS TO ACHIEVE DYN 11 INTERCONNECTION CAPABILITIES.
- THE ASP/1 IS TO CO-ORDINATE WITH AUSGRID THE MODIFICATION AND TESTING OF ANY REQUIRED PROTECTION RELAY.
- THE ASP1 IS REQUIRED TO COMPLY WITH THE CORRECT PROCEDURE(S) FOR WORKING WITH AND/OR NEAR ASBESTOS MATERIAL (REFER TO AUSGRID NS211 - WORKING WITH ASBESTOS PRODUCTS). THE FOLLOWING AUSGRID ASSETS ARE REGISTERED AS CONTAINING ASBESTOS.
  - CONDUITS FROM _____
  - LOW VOLTAGE PANEL AT SUBSTATION _____
  *150 FC Refers to 150mm FIBRE CEMENT CONDUITS AND MAY CONTAIN ASBESTOS
  *150 AC Refers to 150mm ASBESTOS CEMENT CONDUITS WHICH CONTAINS ASBESTOS.

- CONSUMER MAINS LENGTH AND INSTALLATION MUST BE IN ACCORDANCE WITH AUSGRID NETWORK STANDARDS, SERVICE AND INSTALLATION RULES OF NSW AND AS-NZS3000.
- ALL WORKS TO COMPLY WITH AUSGRID NETWORK STANDARDS, UNLESS NETWORK STANDARDS VARIATION IN ACCORDANCE WITH NS181 HAS BEEN APPROVED IN WRITING BY AUSGRID. IN THE EVENT OF DISCREPANCY BETWEEN THIS CERTIFIED DESIGN AND AUSGRID'S NETWORK STANDARDS, THE NETWORK STANDARD REQUIREMENTS SHALL PREVAIL.
- IT IS THE RESPONSIBILITY OF THE ASP/1 TO ENSURE ALL THIRD PARTY ASSETS ARE TRANSFERRED OR REMOVED FROM AUSGRID POLES WITHIN 120 DAYS OF COMPLETING AN AUSGRID ASSET TRANSFER OR REMOVAL.
- IF THERMALLY STABLE BEDDING (TSB) IS REQUIRED AS THE CABLE BEDDING MATERIAL, THE TSB SHALL BE SPECIFIED IN THE DESIGN PLAN CROSS SECTION(S) AS 'TSB - FOOTWAYS, UNCLASSIFIED ROADS & CLASSIFIED REGIONAL ROADS AS PER NS130' OR 'TSB – CLASSIFIED STATE ROADS AS PER NS130' IN ACCORDANCE WITH THE SITE LOCATION OF THE PROPOSED TSB INSTALLATION.



CONSTRUCTION PLAN

SCALE 1:200

SCALE 1 : 200
0 5 15 METRES
10 20

UNDERGROUND CONSTRUCTION WORKS SCHEDULE *(DUCT PULL V1.1)*

REF. IDENTIFIER	ROUTE DISTANCE (m)	CIRCUIT VOLTAGE	CONDUCTOR OR ASSET DETAIL	CONDUCT OR CODE / STOCK CODE	MIN. INTERNAL BENDING RADIUS (mm) DURING INSTALLATION	MIN. INTERNAL BENDING RADIUS (mm) AFTER INSTALLATION	CALCULATED MAX. PULLING TENSION (kN) DURING INSTALLATION	CONSTRUCTION DETAIL
A	-	HV	NEW 1000kVA 'L' TYPE KIOSK SUBSTATION (TERMINATION HV1-52)	-	-	-	-	ESTABLISH 1000kVA 'L' TYPE KIOSK SUBSTATION HS41421 CESSNOCK HOSPITAL NO. 1
A - B	5m	-	6 x 150mm PVC CONDUITS	-	-	-	-	EXCAVATE CABLE TRENCH AND LAY CONDUITS ALONG ADJUSTED SITE BOUNDARY AS PER SECTION X1-X1.
C	-	HV	THREE-TO-ONE JOINT (HV2-23)	434 181758	-	-	-	INSTALL NEW THREE-TO-ONE JOINT (HV2-23) BETWEEN 11kV 185 CU1 TRXQ 70 CU(WS) Z YQ/TX AND 11kV 300 AL3 TR XQ 35 G 35 CU(WS) Z YQ CABLES AT 'E'.
D	-	HV	STRAIGHT THROUGH JOINT FOR SINGLE CORE CABLES (HV2-21)	12051 181758	-	-	-	INSTALL NEW STRAIGHT THROUGH JOINT FOR SINGLE CORE CABLES (HV2-21) BETWEEN 11kV 185 CU1 TRXQ 70 CU(WS) Z YQ/ TX & 11kV 185 CU1 EPR CU(WS) YQ/ TX CABLES AT 'D'.
E	-	LV	FOUR TO ONE JOINT (LV2-36)	2104 61432	-	-	-	CUT EXISTING LV CABLE. EXCAVATE JOINT PIT. INSTALL STJ LV2-36 JOINT- 240AL4 (CODE 2104) TO 4x185 CU1 XQZ CABLE.
A - C	15	11kV	3 X 185 CU1 TRXQ 70 CU(WS) Z YQ/TRIPLEX	181758	1120 (BUNDLED) 870 (PHASE)	745 (BUNDLED) 525 (PHASE)	0.77	INSTALL CABLES THROUGH CONDUIT AS PER SECTION X1-X1. ALLOW FOR TERMINATIONS AT SUBSTATION AT 'A'.
A - D	15	11kV	3 X 185 CU1 TRXQ 70 CU(WS) Z YQ/TRIPLEX	181758	1120 (BUNDLED) 870 (PHASE)	745 (BUNDLED) 525 (PHASE)	0.77	INSTALL CABLES THROUGH CONDUIT AS PER SECTION X1-X1 TO UGOH (LV 1-73) ON POLE FS-82137. ALLOW FOR TERMINATIONS AT SUBSTATION AT 'A'.
A - 1	25m	415V	4 X 185 CU1 XQ Z	61432	145	95	0.71	INSTALL CABLES THROUGH CONDUIT AS PER SECTION X1-X1 . ALLOW FOR TERMINATIONS AT SUBSTATION AT 'A'.
E	-	HV	EXISTING KIOSK SUBSTATION HS39657	-	-	-	-	REMOVE AND DECOMMISSION EXISTING SUBSTATION AND ITS ASSOCIATED EQUIPMENT.
E - C/D/E	65	HV	EXISTING HV CABLE	EX	-	-	-	CUT AND REMOVE EXISTING CABLE BETWEEN POINTS 'E' & 'C'/'D/E'.

WARNING

- THIS DESIGN CANNOT BE USED FOR CONSTRUCTION PURPOSES UNTIL THE LOCATION OF ALL EXISTING SERVICES IS VERIFIED.
- THE INFORMATION PROVIDED IN THIS DESIGN MUST BE CHECKED ON SITE AND THE MOST CURRENT INFORMATION ON THE CONFIGURATION OF ALL SERVICES, INCLUDING AUSGRID'S NETWORK, MUST BE VERIFIED IMMEDIATELY BEFORE CONSTRUCTION COMMENCES BY CONTACTING BEFORE YOU DIG AUSTRALIA (BYDA) AT WWW.BYDA.COM.AU
- BYDA INFORMATION MUST BE CURRENT, AS INDICATED BY THE VALIDITY DATES ON THE BYDA INFORMATION, AT THE TIME OF CONSTRUCTION.

CHECK FOR OTHER SERVICES BEFORE BORING OR EXCAVATION

LEGENDS

ASSET REMOVED		PROPOSED	EXISTING	PROPOSED	EXISTING
Pole - to be removed	Pole	○	●	USL	USL
Column - to be removed	SL Standard	⊠	▣	ABS	ABS
SL - to be removed	Pillar Standard	⊘	◪	IDT	IDT
OH Mains - to be removed	LV Pillar	□	■	Kiosk Sub	Kiosk Sub
UG Mains - to be removed	LV Link Pillar	⊠	⊟	Chamber Sub	Chamber Sub
USL - to be removed	Streetlight			Pole Sub	Pole Sub
Pole Sub - to be removed	Streetlight - PEC			Two Pole Sub	Two Pole Sub
Joint - to be removed	Streetlight - Replace				

PROPOSED		EXISTING	
UGOH ○ Pot End	◁	UGOH ● Pot End	◀
Joint ⬭ Sealed End	◁	Joint ⬬ Sealed End	◀
Conduit ▨		Conduit □	
OH Lines	UG Cables	OH Lines	UG Cables

ASSOCIATED DRAWINGS

CERTIFICATION NUMBER

- #

JHA
Level 20, 2 Market Street, Sydney NSW 2000 Australia
+61 (02) 9437 1000
general@jhaengineers.com.au
www.jhaservices.com
ASP / 3 # 3342

ASP REF. 220549

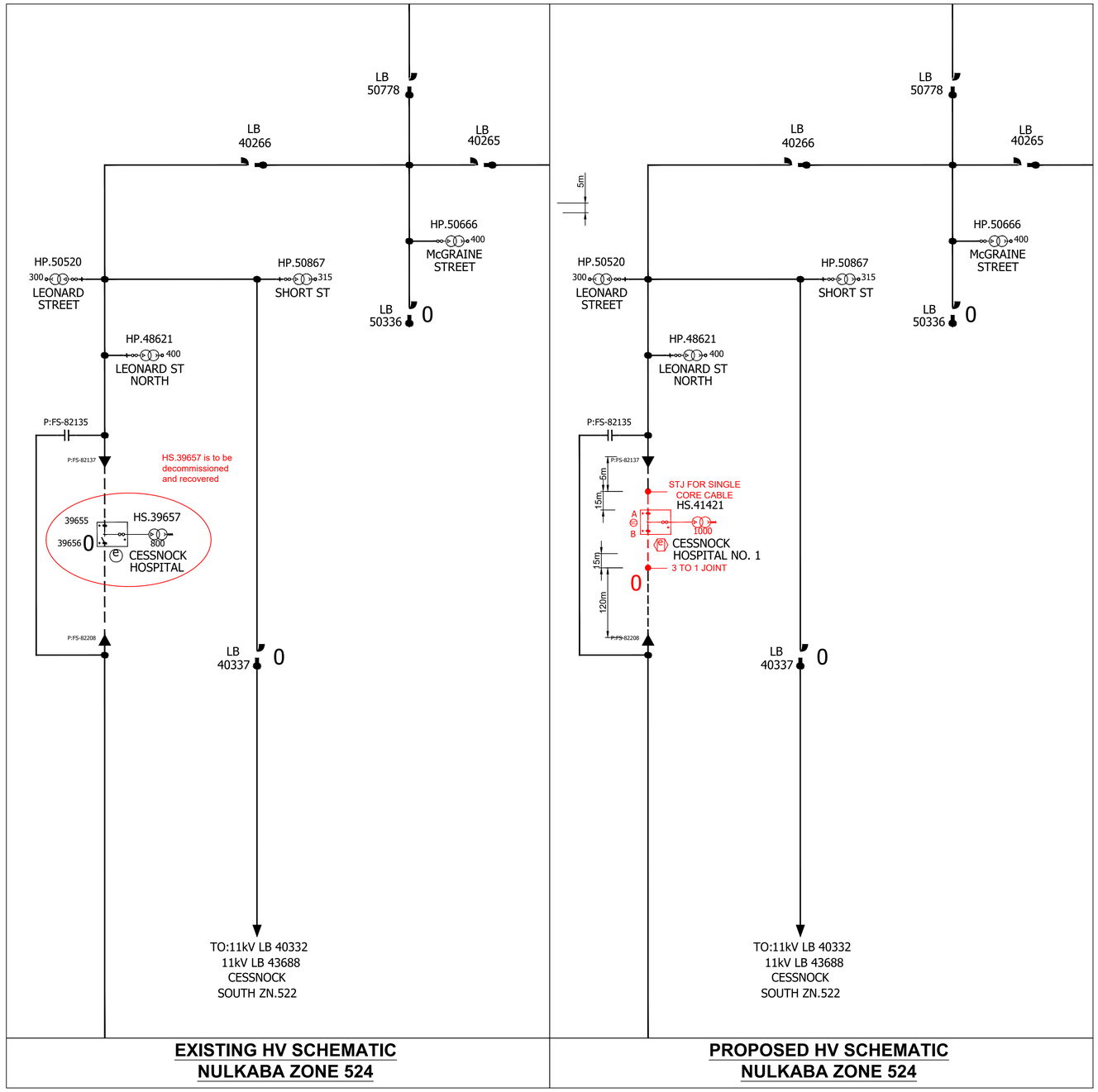
DESIGNED BY	SUSHIL PANT
AUTH NO.	3342/12
SUBMIT DATE	18/10/2024
LGA	CESSNOCK CITY
AUSGRID REF.	FS82
MAP REF.	89 D11

DECOMMISSION HS.39657 & ESTABLISH ONE NEW 1000kVA HS41421 CESSNOCK HOSPITAL NO. 1 L TYPE KIOSK SUBSTATION 24 VIEW ST, CESSNOCK

SIZE A1 | AUSGRID PROJECT No. AN-25079 | SHEETS 1 of 6 | AMD 0

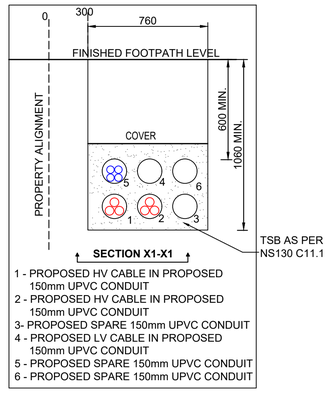
CAD DRAWING DO NOT AMEND
AMENDMENTS

26/03/2024



EXISTING HV SCHEMATIC
NULKABA ZONE 524

PROPOSED HV SCHEMATIC
NULKABA ZONE 524



1 - PROPOSED HV CABLE IN PROPOSED 150mm UPVC CONDUIT
2 - PROPOSED HV CABLE IN PROPOSED 150mm UPVC CONDUIT
3- PROPOSED SPARE 150mm UPVC CONDUIT
4 - PROPOSED LV CABLE IN PROPOSED 150mm UPVC CONDUIT
5 - PROPOSED SPARE 150mm UPVC CONDUIT
6 - PROPOSED SPARE 150mm UPVC CONDUIT

WARNING

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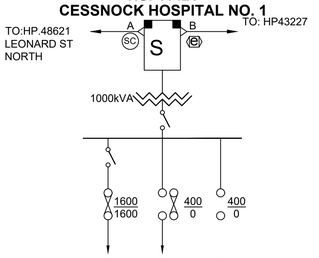
- BEFORE-YOU-DIG- AUSTRALIA (BYDA) INFORMATION MUST NOT BE OLDER THAN 20 BUSINESS DAYS AT THE TIME OF CONSTRUCTION.
- DUE CONSIDERATION OF EXISTING SERVICES HAS BEEN CARRIED OUT IN DESIGN. HOWEVER, THE PROJECT CONSTRUCTOR IS WHOLLY RESPONSIBLE FOR VERIFYING THE EXACT LOCATION OF EXISTING SERVICES & SURVEY WORKS BEFORE CONSTRUCTION. NO RESPONSIBILITY OR LIABILITY WILL BE ACCEPTABLE OF INFORMATION GIVEN OR DAMAGE TO EXISTING SERVICES IN THE VICINITY OF THE WORKS.

ASP LEVEL 2 WORK

ALL LEVEL 2 ASP WORK DEPICTED ON THIS DRAWING IS SHOWN FOR INFORMATION PURPOSES ONLY AND DOES NOT FORM PART OF THE CERTIFIED DESIGN.

HS. 41421
CESSNOCK HOSPITAL NO. 1



LV DISTRIBUTOR DETAILS	
DIST	DESTINATION
1	24 VIEW ST, CESSNOCK (1600 / 1600)
2	FOSTER ST OH (400 / 400) (N/O)
3	WDNO

KIOSK SUBSTATION DETAILS	
SUBSTATION NAME:	CESSNOCK HOSPITAL No. 1
SUBSTATION NUMBER:	HS. 41421
ADDRESS:	FOSTER ST, CESSNOCK
SUBSTATION TYPE:	KL
SIZE (kVA):	1000
VECTOR GROUP:	Dyn1
TAP SETTING:	TAP 3: 11000/433V*
HV SWITCHGEAR:	SCHNEIDER ELECTRIC RMI
HV FUSE DETAILS:	100A SIBA 300.20.93.100
LOAD CYCLE:	LOAD CYCLE A
PHASING DETAIL:	TO BE VERIFIED ON SITE BY THE ASP1 PRIOR TO COMMISSIONING
LOW VOLTAGE BOARD:	1600 / 400 /400
CCT1 LV FUSE SIZE (Amps):	1600A
CCT2 LV FUSE SIZE (Amps):	400A(N/O)
CCT3 LV FUSE SIZE (Amps):	WDNO
CONFIGURE AS Dyn1:	YES
EARTHING REQUIREMENTS:	AS PER NS116
SUBSTATION PIERING:	AS PER NS141 DRAWING 151572
EASEMENT PLAN DETAIL:	AS PER NS141 "SITE PLAN A " L TYPE KIOSK

ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH AUSGRID'S NETWORK STANDARDS.

CHECK FOR OTHER SERVICES BEFORE BORING OR EXCAVATING

LEGENDS

ASSET REMOVED		PROPOSED	EXISTING		PROPOSED	EXISTING	PROPOSED	EXISTING
Pole - to be removed	Pole			USL			UGOH Pot End	UGOH Pot End
Column - to be removed	SL Standard			ABS			Joint Sealed End	Joint Sealed End
SL - to be removed	Pillar Standard			IDT			Conduit	Conduit
OH Mains - to be removed	LV Pillar			Kiosk Sub			OH Lines UG Cables	OH Lines UG Cables
UG Mains - to be removed	LV Link Pillar			Chamber Sub				
USL - to be removed	Streetlight			Pole Sub				
Pole Sub - to be removed	Streetlight - PEC			Two Pole Sub				
Joint - to be removed	Streetlight - Replace							

CAD DRAWING DO NOT AMEND

AMENDMENTS

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ASP REF. 220549

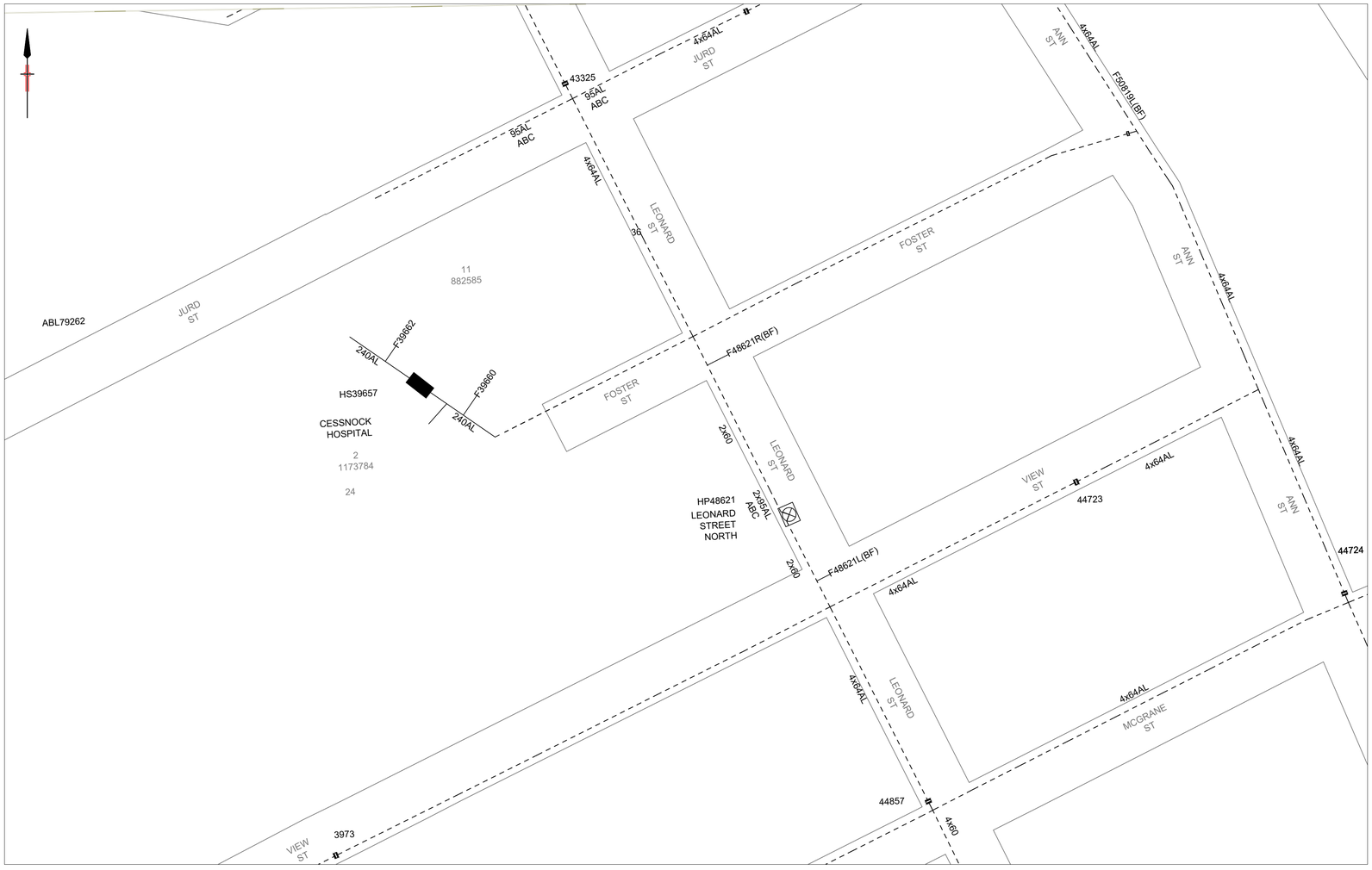
CERTIFICATION NUMBER ## - ##

DESIGNED BY	SUSHIL PANT
AUTH NO.	3342/12
SUBMIT DATE	18/10/2024
LGA	CESSNOCK CITY
AUSGRID REF.	FS82
MAP REF.	89 D11

DECOMMISSION HS.39657 & ESTABLISH ONE NEW 1000kVA HS41421 CESSNOCK HOSPITAL NO. 1 L TYPE KIOSK SUBSTATION 24 VIEW ST, CESSNOCK

SIZE A1 | AUSGRID PROJECT No. AN-25079 | SHEETS 2 of 6 | AMD. 0

26/03/2024



EXISTING LV GEO-SCHEMATIC NETWORK

(NTS)

LEGENDS FOR LV GEO-SCHEMATIC NETWORK

	EXISTING	PROPOSED		EXISTING	PROPOSED
LV UG CABLE			OPEN POINT	0	0
LV OH CABLE			UG LINK BOX		
UG CABLE JOINT			LV PILLAR		
TEE			LV LINK/SWITCH PILLAR	NUM ?	NUM ?
UGOH			KIOSK		
TERMINATION			SUBSTATION CHAMBER		
MAIN SECTION			SUBSTATION POLE MOUNTED SUBSTATION	NUM ?	NUM ?
IDT			LINK BOX INTERNALS	1 2 3	1 2 3
SHACKLE POINT					
FUSE					
LINK					

WARNING

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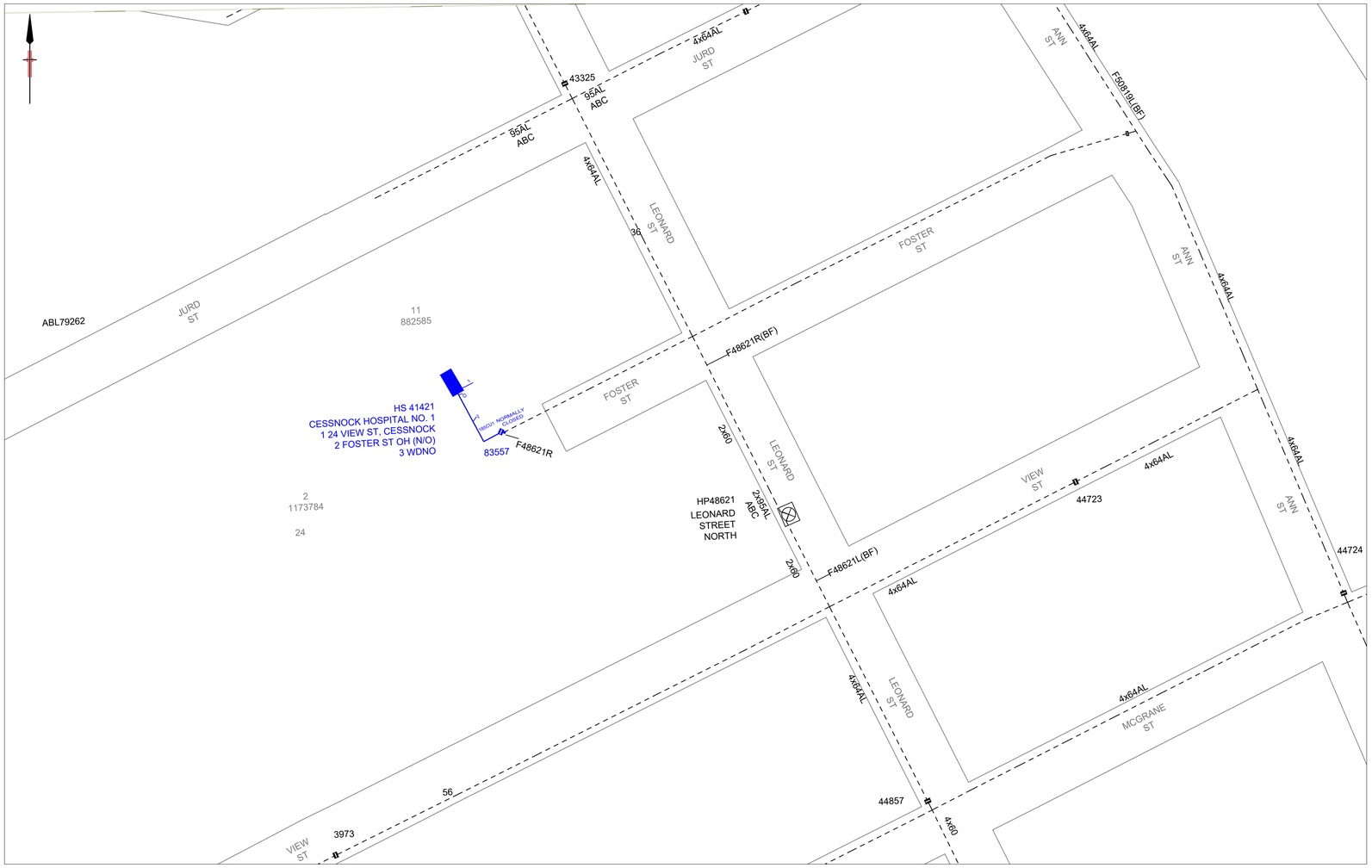
SIZE A1 | AUSGRID PROJECT No. AN-25079 | SHEETS 3 of 6 | AMD 0

26/03/2024



PROPOSED LV GEO-SCHEMATIC NETWORK

(NTS)

LEGENDS FOR LV GEO-SCHEMATIC NETWORK

	EXISTING	PROPOSED
LV UG CABLE		
LV OH CABLE		
UG CABLE JOINT		
TEE		
UGOH		
TERMINATION		
MAIN SECTION		
IDT		
SHACKLE POINT		
FUSE		
LINK		

	EXISTING	PROPOSED
OPEN POINT		
UG LINK BOX		
LV PILLAR		
LV LINK/SWITCH PILLAR	NUM ?	NUM ?
KIOSK		
SUBSTATION CHAMBER		
SUBSTATION POLE MOUNTED		
SUBSTATION	NUM ?	NUM ?
LINK BOX INTERNALS		

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AMENDMENTS

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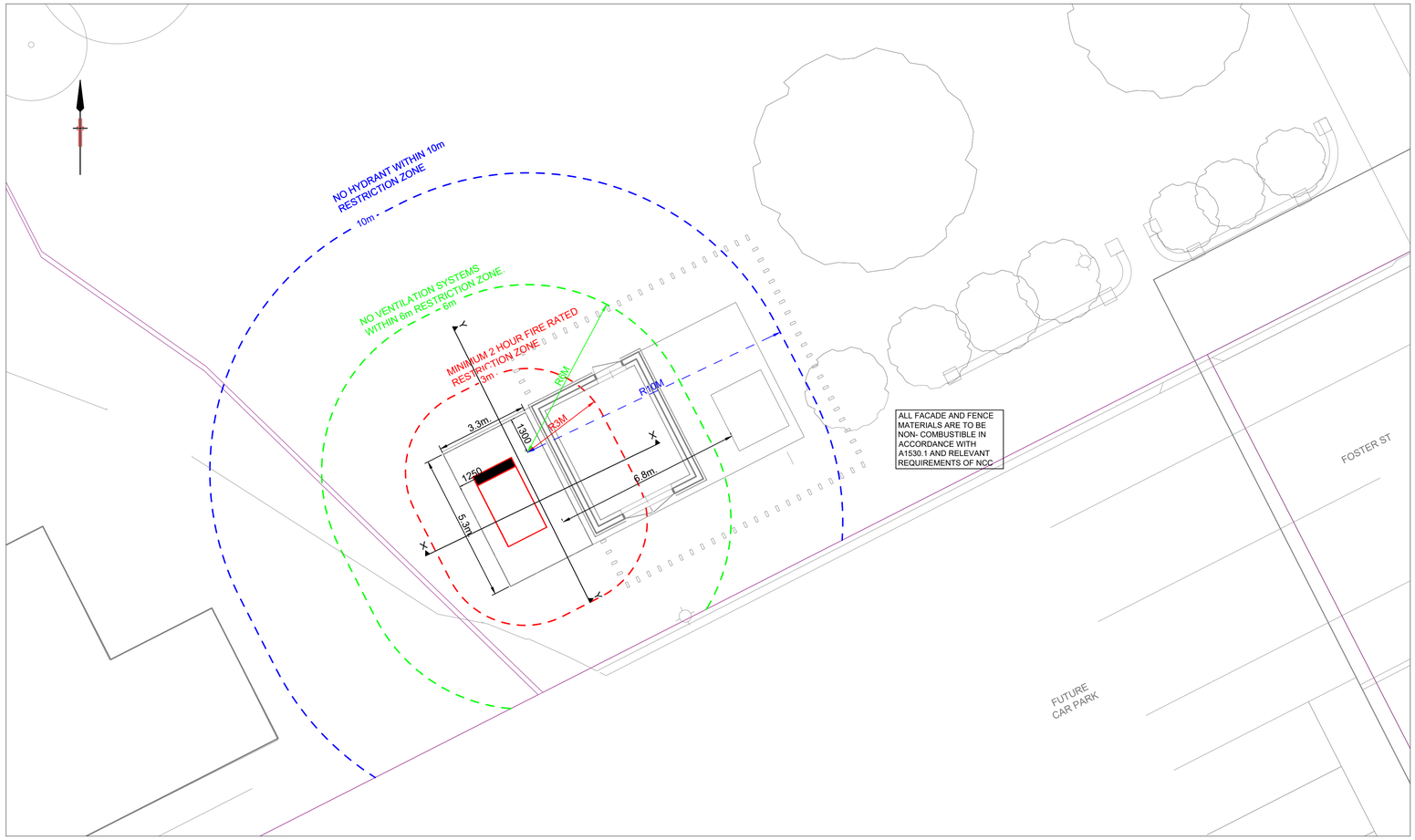
AUTH NO.	3342/12
SUBMIT DATE	18/10/2024
LGA	CESSNOCK CITY
AUSGRID REF.	FS82
MAP REF.	89 D11
ASP REF.	220549
CERTIFICATION NUMBER	##-##

DECOMMISSION HS.39657 & ESTABLISH ONE NEW 1000kVA HS41421 CESSNOCK HOSPITAL NO.1 L TYPE KIOSK SUBSTATION 24 VIEW ST, CESSNOCK

SIZE	AUSGRID PROJECT No.	SHEETS	AMD.
A1	AN-25079	4 of 6	0

26/03/2024

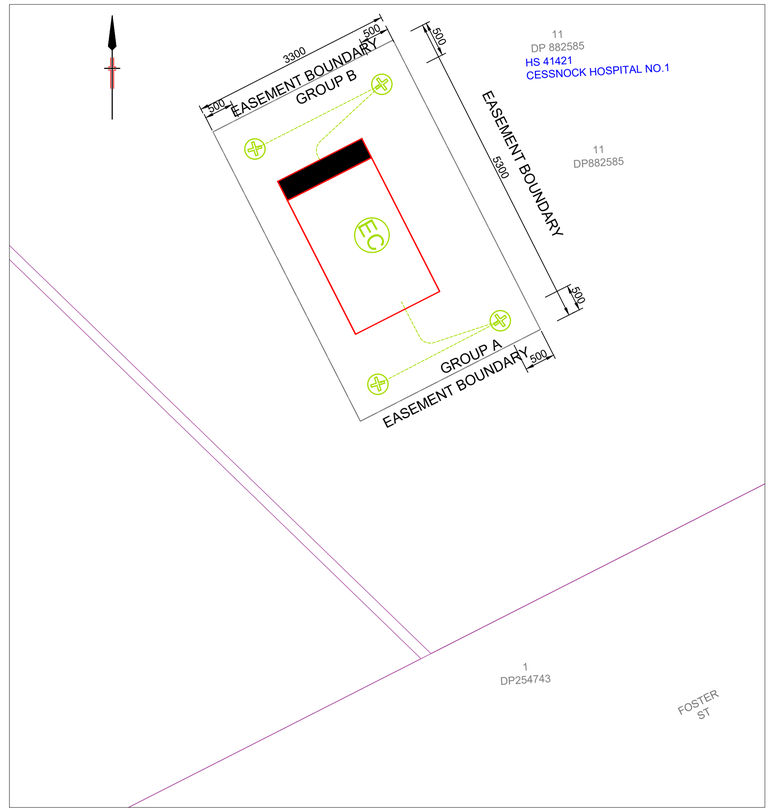


SUBSTATION PLAN
1:100

SCALE 1 : 100

0 4 8 METRES

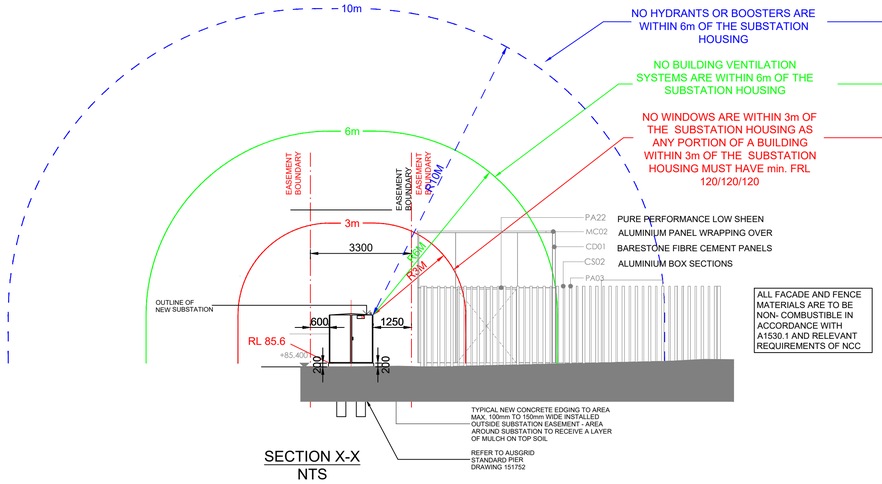
10m 2 6 10



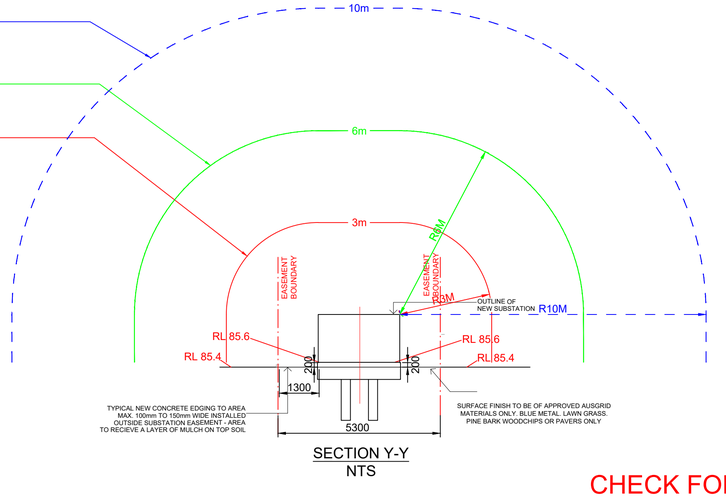
EARTHING DIAGRAM HS41421
N.T.S.

SUGGESTED STANDARD MINIMUM EARTHING SPECIFICATION HS41421

HV ELECTRODES		LV ELECTRODES	
NUMBER OF ELECTRODES	2	NUMBER OF ELECTRODES	2
DEPTH OF EACH ELECTRODE	5.4m	DEPTH OF EACH ELECTRODE	5.4m
SPACING BETWEEN EACH ELECTRODE	2.3m	SPACING BETWEEN EACH ELECTRODE	2.3m
MAX RESISTANCE - NORMAL	100Ω	MAX RESISTANCE - NORMAL	100Ω
MAX RESISTANCE - DROUGHT	100Ω	MAX RESISTANCE - DROUGHT	100Ω
COMBINED RESISTANCE			100Ω
MINIMUM SEPARATION FROM TELCO ASSETS			1.2m
MINIMUM SEPARATION BETWEEN HV AND LV ELECTRODES			4.3m
EARTHING CONFIGURATION			COMBINED
DESIGN CURVE			ENA-TDMEN 100 Ωm
ELECTRODES INSTALLATION			DRIVEN



SECTION X-X
NTS



SECTION Y-Y
NTS

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CERTIFICATION NUMBER ## - ##

DESIGNED BY	SUSHIL PANT
AUTH NO.	3342/12
SUBMIT DATE	18/10/2024
LGA	CESSNOCK CITY
AUSGRID REF.	FS82
MAP REF.	89 D11

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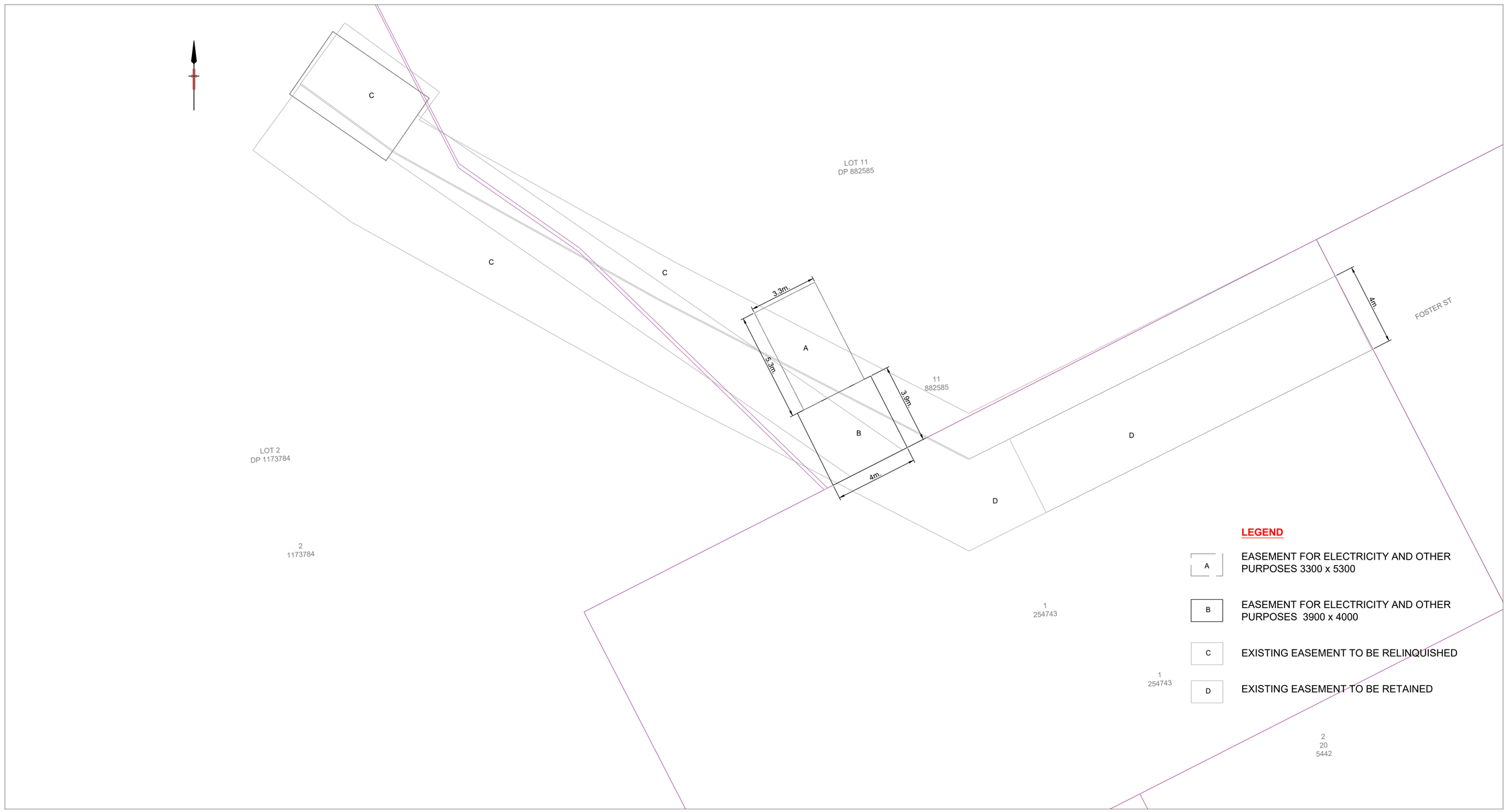
SIZE A1 | AUSGRID PROJECT No. AN-25079 | SHEETS 5 of 6 | AMD 0

26/03/2024



EASEMENT PLAN

1:100

SCALE 1 : 100

0 2 4 6 8 10 METRES

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SIZE	AUSGRID PROJECT No.	SHEETS	AMD.
A1	AN-25079	6 of 6	0

26/03/2024

APPENDIX B – ELECTRICAL SITE PLANS AND TARGETED EXTERNAL LIGHT LUX LEVELS

COMBINED CAMPUS/BUILDING/FLOOR DISTRIBUTOR (CD/BD/FD-GL-W) ROOM:
- MIN. INTERNAL DIMENSIONS: 6 m(W) X 5m(D).
- NO WET SERVICES TRAVERSING OR OVER THE CD/FD ROOM
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- POWER SUPPLY SOURCED FROM NEW BUILD (UPS & ESS)
- TO HOUSE:
  * 7x 800x1200x42RU COMMUNICATIONS RACKS AS PER THE NSW HEALTH ICT GUIDELINES FOR THE FOLLOWING EQUIPMENT
    * 2x CD (ACTIVE + PASSIVE)
    * 1x NURSE CALL
    * 1x IPTV/IPES
    * 1x BMCS
    * 2x SEC + CCTV
  * IDF FRAMES & SECURITY WALL-MOUNTED EQUIPMENT
  * 2x 800x1000x42RU COMMUNICATIONS RACKS AS PER THE NSW HEALTH ICT GUIDELINES FOR BD (ACTIVE + PASSIVE)

NBN LEAD-IN IN-GROUND CONDUIT TO TURN UP INSIDE GF WEST FD AND TRANSITION TO VERTICAL AND HORIZONTAL CABLE TRAYS TO THE DAS ROOM ON ROOF PLANT. REFER TO DWG CHR-EL-DRG-300xxx SERIES FOR CABLING RETICULATION INSIDE THE BUILDING

WEST FLOOR DISTRIBUTOR (FD-GL-W) GF:
- MIN. INTERNAL DIMENSIONS: 3.2 m(W) x 3.5m(D).
- NO WET SERVICES TRAVERSING OR OVER THE FD
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION (2H FR) REQUIRED TO AVOID SPRINKLERS IN FD

WEST EDB CUPBOARD GF:
- MIN. INTERNAL DIMENSIONS: 3m(W) x 1m(D).
- NO WET SERVICES TRAVERSING THE EDB
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION (2H FR) REQUIRED TO AVOID SPRINKLERS IN CUPBOARD

INTERNAL MDB1 ROOM:
- MIN INTERNAL DIMENSIONS: 4 m(W) x 8m(D)
- 2H FIRE RATED
- 2 DOORS (SINGLE & DOUBLE) SPACED WELL APART FOR EGRESS
- SMOKE-SEALED DOORS AND NON-COMBUSTIBLE INTERNAL LINEN
- HOUSES:
  * MDB1 TO SERVE NEW BUILD
  * GENSET MDB
  * AUXILIARY SERVICES EDB FOR GENSET
  * ESS & NON-ESS EDBS TO SERVE THE CENTRAL FIRE COMPARTMENT

EXTERNAL ESSENTIAL EDB DB-EXT-W-E1 TO SERVE THE DB-EV, EXTERNAL LIGHTING AND OTHER SERVICES ON THE WESTERN END OF THE BUILDING. LOAD SHEDDING CONTACTOR FOR EVDB CIRCUIT BREAKER TO AVOID OPERATION IN GENERATOR MODE

INDICATIVELY LOCATION FOR THE 10x 22kW ELECTRIC VEHICLE CHARGING STATIONS (EVCS) (RED HATCHED AREA) AND FUTURE 10x22kW EVCS (BLUE HATCHED AREA) TBC WITH CLIENT. CONTRACTOR TO ALLOW FOR 1xø40 mm HDUVPC CONDUIT FROM THE EVDB LOCATION TO EACH CAR SPACE

ELECTRIC VEHICLE CHARGING (EVC) EDB AND ASSOCIATED ELECTRICAL IN-GROUND PATHWAY FROM EXTDB OF NEW BUILD

CONTRACTOR TO ALLOW FOR THE FOLLOWING ITEMS TO THE BIKE STORE

RETICULATION:
- ALLOW FOR 1xø50mm HDUPVC CONDUIT FOR COMMUNICATIONS/SECURITY AND POWER (2-OFF TOTAL)

LIGHTING:
- 3x LIGHT FIXTURES TYPE B1 AND 1x TYPE B1-E
- IP-RATED MOTION SENSOR
- 1x 1PH 20A NON-ESSENTIAL POWER SUB-CIRCUITS FROM THE CLOSEST EDB

POWER:
- 60xDGPO WITH DUAL USB-A CHARGING STATION (1x PER LOCKER). ALLOW FOR 4x 1PH 20A NON-ESSENTIAL POWER SUB-CIRCUITS FROM THE CLOSEST EDB
- 5xDGPO WP FOR E-BIKE CHARGING STATIONS. ALLOW FOR 2x 1PH 20A NON-ESSENTIAL POWER SUB-CIRCUIT FROM THE CLOSEST EDB

SECURITY:
- ALLOW FOR A PIN/PROXIMITY COMBO DEVICE, ELECTRIC STRIKE AND REED SWITCH FOR SWINGING DOOR

REFER TO SHEET CHR-EL-DRG-010100 FOR FURTHER LEVEL 1 SITE PLAN DETAILS

CONTRACTOR TO ALLOW SUPPLYING AND INSTALLING 2xSP1 SPOTLIGHTS TO THE LIGHT POLE TYPE P5 TO SERVE THE FLAG POLES LOCATED ON THE WEST OF THE LIGHT POLE TYPE P5

EXISTING NBN INFRASTRUCTURE NORTH OF JURD ST TO BE EXTENDED TO THE FRONTAGE OF THE SITE FOR A DIVERSE NBN LEAD-IN PATHWAY TO THE CAMPUS.

PROPOSED ELECTRICAL IN-GROUND CABLING RETICULATION FROM NEW MSB ON LEVEL ABOVE TO MDB1 WITHIN THE NEW BUILD. REFER TO THE DRAWING CHR-EL-DRG-010100 FOR FURTHER DETAILS

EAST EDB CUPBOARD GF:
- MIN. INTERNAL DIMENSIONS: 3m(W) x 1m(D).
- NO WET SERVICES TRAVERSING THE EDB
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION REQUIRED TO AVOID SPRINKLERS IN CUPBOARD

EAST FLOOR DISTRIBUTOR (FD-GL-E) GF:
- MIN. INTERNAL DIMENSIONS: 3.3 m(W) x 3.4m(D).
- NO WET SERVICES TRAVERSING OR OVER THE FD
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION (2H FR) REQUIRED TO AVOID SPRINKLERS IN FD

EXTERNAL ESSENTIAL EDB DB-EXT-E-E1 TO SERVE THE LOADS IN THE HYD PLANT ROOM, MEDICAL GAS ENCLOSURE, OXYGEN TANK COMPOUND AND NON-LIFE SAFETY LOADS WITHIN THE FIRE PUMP ROOM, EXTERNAL LIGHTING AND OTHER SERVICES ON THE EASTERN END OF THE BUILDING.

PROPOSED COLD WATER PUMPSET SYSTEM. CONTRACTOR TO ALLOW FOR THE FOLLOWING ITEMS TO THE ROOM.
- 1X NEW EDB DB-EXT-E-E1 TO SERVE THE LOADS IN THE HYD PLANT ROOM, MEDICAL GAS ENCLOSURE, OXYGEN TANK COMPOUND AND NON-LIFE SAFETY LOADS WITHIN THE FIRE PUMP ROOM
- 4X LIGHT FIXTURES TYPE B1, 2X TYPE B1-E AND 1X 1PH 20A ESSENTIAL LIGHTING SUB-CIRCUITS FROM THE EDB DB-EXT-E-E1
- 2X 2-WAY WP LIGHT SWITCHES
- 5X3PH 20A ISOLATORS + 8X 240V WP SGPOS, 4X 3PH 20A & 1X 1PH 20A ESSENTIAL POWER SUB-CIRCUITS FROM THE EDB DB-EXT-E-E1
- 4X SINGLE DATA OUTLETS (INCLUDING 2-CORE SMOF FOR OUTDOORS, MEDIA CONVERTER + WP POWER SUPPLY IF LOCATED FURTHER THAN 90M FROM THE CLOSEST COMMS ROOM IN IP-RATED ENCLOSURE) FOR BMS CONNECTION

PROPOSED NEW MEDICAL GAS STORE ROOM AND OXYGEN TANK COMPOUND. CONTRACTOR TO ALLOW FOR THE FOLLOWING ITEMS TO THE MEDICAL GAS STORE ROOM AND OXYGEN TANK COMPOUND.

MEDICAL GAS STORE ROOM
- 1X LIGHT FIXTURES TYPE B1, 1X TYPE B1-E AND 1X 1PH 20A ESSENTIAL LIGHTING SUB-CIRCUITS FROM THE EDB DB-EXT-E-E1
- 1X WP LIGHT SWITCHES

OXYGEN TANK COMPOUND:
- 1X LIGHT FIXTURES TYPE B1 AND 1X 1PH 20A ESSENTIAL LIGHTING SUB-CIRCUITS FROM THE EDB DB-EXT-E-E1
- 1X WP LIGHT SWITCHES
- 1X3PH 32A ISOLATOR + SOCKET + 40A 3PH RCBO CURVE D IN AN IP-RATED ENCLOSURE + 2X 240V WP SGPOS, 1X 3PH 32A & 1X 1PH 20A ESSENTIAL POWER SUB-CIRCUITS FROM THE EDB DB-EXT-E-E1
- 2X SINGLE DATA OUTLETS (INCLUDING 2-CORE SMOF FOR OUTDOORS, MEDIA CONVERTER + POWER SUPPLY IF LOCATED FURTHER THAN 90M FROM THE CLOSEST COMMS ROOM IN IP-RATED ENCLOSURE) FOR BMS CONNECTION

GENERATOR LINK BOX TO BE WALL-MOUNTED ON RETAINING WALL. REFER TO DRAWING CHR-EL-DRG-900002 FOR FURTHER DETAILS.

PROPOSED NEW FIRE PUMP ROOM AND TANKS.

CONTRACTOR TO ALLOW FOR THE FOLLOWING ITEMS TO THE FIRE PUMP ROOM.
- 3X LIGHT FIXTURES TYPE B1, 1X TYPE B1-E AND 1X 1PH 20A ESSENTIAL LIGHTING SUB-CIRCUITS FROM THE EDB DB-EXT-E-E1
- 1X WP LIGHT SWITCH
- 1X LIFE SAFETY EDB DB-EXT-E-LS1 TO SERVE THE LIFE SAFETY-RELATED FIRE LOADS WITHIN THE FIRE PUMP ROOM
- 6X 240V WP SGPOS, 2X 1PH 20A ESSENTIAL POWER SUB-CIRCUITS FROM THE EDB DB-EXT-E-LS1
- 4X SINGLE DATA OUTLETS (INCLUDING 2-CORE SMOF FOR OUTDOORS, MEDIA CONVERTER + POWER SUPPLY IF LOCATED FURTHER THAN 90M FROM THE CLOSEST COMMS ROOM IN IP-RATED ENCLOSURE) FOR BMS CONNECTION

EXTERNAL LIGHTING LEGEND

Post-top light fixture type:
AEC illuminazione i-Tron series
P1- 8m height - 132W back-to-back - 3000k
P3- 8m height - 132W single - 3000k
P5- 6m height - 100W back-to-back - 3000k
P6- 6m height - 100W single - 3000k
P7- 6m height - 67W single - 3000k

Feature post top light fixture type:
Arcluce Lunio 7
P8- 4m height - 21W - 3000k

Feature LED bollard type:
Arclude Klou 180
BL1 - 1m height - 21W - 3000k

Wall-mounted floodlight fixture
AEC illuminazione MX Pro series
W1 - 290x215x150mm - 29W - 3000k

Wall-mounted brick light fixture
Cree Dot Wall
W2 - 290x215x150mm - 29W - 3000k

10 5 0 10 20 30 40 m

1 : 500-A1 1 : 1000-A3

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.

TO BE PRINTED IN COLOUR

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
P1	10.05.24	50% SCHEMATIC DESIGN	J.G.
P2	07.06.24	80% SCHEMATIC DESIGN	J.G.
P3	26.07.24	100% SCHEMATIC DESIGN	J.G.
P4	23.08.24	50% DESIGN DEVELOPMENT	J.G.
P5	20.09.24	80% DESIGN DEVELOPMENT	J.G.
P6	11.10.24	WIP DD ISSUE	J.G.

NOTES:

1. PROVIDE ADDITIONAL CABLING, PITS, AND CONDUITS AS SHOWN TO SUPPORT EXTERNAL LIGHTING, CCTV, SECURITY, WI-FI, ELECTRIC VEHICLE CHARGING STATIONS (EVCS) AND CARPARK MANAGEMENT SYSTEM.
2. CONDUITS ROUTES ARE INDICATIVELY ONLY. THE EXACT LOCATION OF THE CONDUITS AND PITS TO BE DETERMINED ON SITE. CONTRACTOR TO INSTALL THE CONDUITS IN SPLAYED/STACKED CONFIGURATION BASED ON THE SITE CONDITIONS. CONDUIT SIZES SHALL BE DESIGNED BY THE CONSTRACTOR AS PER THE CIRCUITS AND SITE CONDITIONS AND REQUIREMENTS.
3. COORDINATE THE POSITIONING OF THE MAIN SITE INFRASTRUCTURE WITH LIGHTING, SMALL POWER, COMMUNICATIONS AND SECURITY AND OTHER SERVICES.
4. REFER TO ESSENTIAL ENERGY ASP LEVEL 3 DETAILS FOR EASEMENTS AND FURTHER DETAILS IN THE DWG CHR-EL-DRG-80xxx SERIES.
5. ALL PITS ARE TO BE COMPLETE WITH DRAINAGE. COORDINATE INTERFACES ARE SUITABLE SOLUTIONS WITH CIVIL AND HYDRAULIC TRADES.
6. ALL CONDUITS TO BE INSTALLED TO AVOID STRUCTURAL ELEMENTS AND LIFT PITS, ETC
7. CONDUITS ENTERING A BUILDING FROM ACCESS HOLE OR PITS SHALL BE APPROPIATELY INSTALLED AND/OR PLUGGED WITH MANUFACTURED PRE-FABRICATED PLUGS/CAPS AT THE TURN UP END INSIDE THE ROMO TO INHIBIT THE ENTRY OF FLUID, GAS, RODENTS INTO THE BUILDING.
8. CONDUITS SHALL BE TRENCHED DEEP ENOUGH TO PROVIDE A MINIMUM OF 500mm (COMMS) OR 600mm (POWER) COVER ABOVE THE CONDUIT. THE CONDUITS SHALL BE BEDDED ON TOP OF 100mm OF SAND, COVERED WITH 100mm OF SAND & 200mm OF CLEAN FILL. PROVIDE COMMS/ELECTRICAL WARNING MARKER TAMPE BOVE CLEAN FIELD, WHICH SHALL BE 200mm BELOW FFL.

PROJECT MANAGER
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PROJECT
CESSNOCK HOSPITAL REDEVELOPMENT

24 VIEW ST, CESSNOCK
NSW 2325

TITLE
ELECTRICAL SERVICES
EXTERNAL SERVICES SITE PLAN - GROUND LEVEL

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	A.B.	SCALE @ A1
CHECKED	J.G.	
APPROVED	J.H.	**As indicated**
CREATED	MAY 2024	
JOB No.	220549	

DRAWING No. **CHR-EL-DRG-010000** REV **P6**

EXTERNAL LIGHTING LEGEND

Post-top light fixture type:
AEC illuminazione i-Tron series
P1- 8m height - 132W back-to-back - 3000k
P3- 8m height - 132W single - 3000k
P5- 6m height - 100W back-to-back - 3000k
P6- 6m height - 100W single - 3000k
P7- 6m height - 67W single - 3000k

Feature post top light fixture type:
Arcluce Lunio 7
P8- 4m height - 21W - 3000k

Feature LED bollard type:
Arclude Klou 180
BL1 - 1m height - 21W - 3000k

Wall-mounted floodlight fixture
AEC illuminazione MX Pro series
W1 - 290x215x150mm - 29W - 3000k

Wall-mounted brick light fixture
Cree Dot Wall
W2 - 290x215x150mm - 29W - 3000k

JURD STREET

LEONARD STREET

VIEW STREET

FOSTER STREET

WEST FLOOR DISTRIBUTOR (FD) L1:
- MIN. INTERNAL DIMENSIONS: 3.7 m(W) x 3.1m(D).
- NO WET SERVICES TRAVERSING OR OVER THE FD
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION (2H FR) REQUIRED TO AVOID SPRINKLERS IN FD

WEST EDB CUPBOARD L1:
- MIN. INTERNAL DIMENSIONS: 3m(W) x 1m(D).
- NO WET SERVICES TRAVERSING THE EDB
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION REQUIRED TO AVOID SPRINKLERS IN CUPBOARD

CENTRAL EDB/COMMS CUPBOARD RISER:
- MIN. INTERNAL DIMENSIONS: 1.2 m(W) x 0.3m(D).
- NO WET SERVICES TRAVERSING THE EDB
- USED FOR VERTICAL CABLING RETICULATION FROM MDB ON LEVEL BELOW TO SERVE THIS LEVEL
- USED FOR VERTICAL CABLING RETICULATION FROM CD/BD/FD-G-W TO THE EXISTING PABX ROOM IN THE EXISTING MAIN BUILDING (VIA THE LINK BRIDGE)
- INTERNAL WALL BETWEEN ELECTRICAL AND COMMUNICATIONS IS REQUIRED

EXISTING STANDBY DIESEL GENERATOR SERVING THE KITCHEN TO BE DISCONNECTED AND DECOMMISSIONED. ESSENTIAL SUPPLY TO THE KITCHEN BLD TO BE SERVE FROM EXISTING MDB2 WITHIN THE EXISTING MAIN BUILDING

REFER TO SHEET CHR-EL-DRG-300105 FOR FURTHER CABLE TRAY DETAILS IN L1 LINK BRIDGE GOING TO THE NEW BUILD

EXISTING CABLING RETICULATION FROM THE ENGINEERING BLD TO THE KITCHEN VIA EXISTING BUILDINGS TO BE DISCONNECTED, PULLED BACK AND DECOMMISSIONED

CONTRACTOR TO ALLOW NEW SUB-MAIN CABLING AND ASSOCIATED PROTECTION DEVICE TO DB-MORTUARY FROM DB-13 IN KITCHEN USING EXISTING CONCRETE TRENCH

PROPOSED PATHWAY FOR CABLING RETICULATION FROM EXISTING MDB2 TO DBs WITHIN KITCHEN VIA:
- CEILING VOID WITHIN EXISTING BUILDING
- TRANSITION TO ROOF VIA 150mm NEW CABLE TRAY WITH LID
- RETICULATE OVER THE ROOF OF EXISTING MAIN HOSPITAL BUILDING TO SOUTH-EAST CORNER OF EXISTING KITCHEN BUILDING
- RETICULATE BELOW ROOF OVERHANG TO NORTH-EAST CORNER AND TRANSITION TO EXISTING CONCRETE TRENCH VIA NEW EXTERNAL VERTICAL RISER
- NEW 150mm CABLE TRAY WITHIN KITCHEN UNDERCROFT AREA

PROPOSED PRIMARY AND SECONDARY PATHWAYS FROM NEW CD/BD/FD-GL-W IN NEW BUILD TO PABX ROOM IN EXISTING MAIN BUILDING:
* PATHWAY #1 TO BE VIA NEW COMMUNICATIONS CABLE TRAYS FROM CD/BD>CENTRAL ELEC/COMMS RISER> NEW LINK BRIDGE TO EXISTING MAIN BUILDING>ROOF>PABX ROOM
* PATHWAY #2 TO BE VIA NEW & EXISTING COMMS IN-GROUND CONDUITS AND CABLE TRAYS FROM CD/BD>FD-GL-W>WESTERN CARPARK>EXISTING STORES BLD TO EXISTING MAIN BUILDING>ROOF >PABX ROOM
REFER TO THE DRAWING CHR-EL-DRG-010000 FOR FURTHER DETAILS

CABLE TRAY TO TRANSITION TO THE ROOF OF EXISTING MAIN HOSPITAL BUILDING

EAST FLOOR DISTRIBUTOR (FD) L1:
- MIN. INTERNAL DIMENSIONS: 3.7 m(W) x 3.1m(D).
- NO WET SERVICES TRAVERSING OR OVER THE FD
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION (2H FR) REQUIRED TO AVOID SPRINKLERS IN FD

EAST EDB CUPBOARD L1:
- MIN. INTERNAL DIMENSIONS: 3m(W) x 1m(D).
- NO WET SERVICES TRAVERSING THE EDB
- SMOKE SEALED DOORS & NON-COMBUSTIBLE INTERNAL LINEN
- PERFORMANCE SOLUTION REQUIRED TO AVOID SPRINKLERS IN CUPBOARD

DIESEL FUEL PIPEPWORK TO RISE TO THE LEVEL ABOVE WITHIN THE FACADE CLADDING

EXISTING DB-3 AND ASSOCIATED SUB-MAIN CABLING WITHIN THE CESSNOCK HOUSE IS TO BE DISCONNECTED, AND DECOMMISSIONED. CONTRACTOR TO ALLOW FOR REWIRING EXISTING NON-REDUNDANT LIGHTING & POWER SUB-CIRCUITS BACK TO DB-2, INCLUSIVE OF NEW POWER SUPPLY TO EXISTING SUB-FIP

REFER TO SHEET CHR-EL-DRG-010000 FOR FURTHER GROUND LEVEL SITE PLAN DETAILS

PROPOSED ELECTRICAL IN-GROUND CABLING RETICULATION FROM NEW MSB TO MDB1 WITHIN THE NEW BUILD AND FUEL LINES FROM BULK FUEL STORAGE TANK TO GENSET ON THE ROOF OF NEW BUILD. REFER TO THE DRAWING CHR-EL-DRG-010000 AND CHR-EL-DRG-010200 FOR FURTHER DETAILS

EXISTING FIBRE & COPPER LINK PATHWAY FROM PABX ROOM TO RACK J IS WITHIN DEMOLITION ZONE. CONTRACTOR TO ALLOW PROVIDING NEW OPTIC FIBRE AND COPPER LINKS VIA A COMBINATION OF EXISTING AND PROPOSED PATHWAY FROM THE PABX ROOM
- PABX ROOM TO ROOF OF EXISTING MAIN HOSPITAL BUILDING
- FOLLOW EXISTING COMMS CONDUIT PATHWAY OVER THE ROOF OF THE NEW BUILDING AND OVER THE COVERED WALKWAY TO THE ENGINEERING BLD
- FOLLOW THE EXISTING COMMS CONDUIT PATHWAY WITHIN THE CEILING VOID OF ENGINEERING BUILDING TO THE NORTH-EAST CORNER
- TRANSITION TO NEW IN-GROUND COMMS CONDUITS TO THE SOUTH-EAST CORNER OF CESSNOCK HOUSE
- FOLLOW THE EXISTING IN-GROUND COMMS CONDUIT BELOW CESSNOCK HOUSE TO RACK J

PROPOSED NEW IN-GROUND CONDUITS AND PITS FOR LV POWER SUPPLY OF CESSNOCK HOUSE FROM NEW MSB-1

FUTURE MSB-2 DIM: 2500W x 2200h X 650D mm
FUTURE PFC/AHF DIM: 1000W x 2200H x 100D mm

BULK FUEL STORAGE TANK AND PUMPSET
- DOUBLE WALL, 2kL CAPACITY
- MIN TANK DIMENSIONS 2.25 m(W) x 1.95m(D).
- 1m CLEARANCE REQUIRED AROUND ALL SIDES
- REQUIRES VEHICLE ACCESS FOR FILL UP BULK TANK

PROPOSED IN-GROUND DIESEL FUEL LINES FROM THE FUEL BULK TANK TO THE NEW GENSET ON THE PLANT ROOF OF THE NEW BUILD (VIA AN EXTERNAL FUEL RISER):
- 1Xø32MM FUEL SUPPLY PIPEWORK FROM THE PUMPSETS WITHIN THE BULK TANK TO THE GENSET
- 1Xø40MM FUEL OVERFLOW RETURN PIPEWORK FROM THE GENSET TO THE BULK TANK

CONTRACTOR TO ALLOW FOR THE FOLLOWING ITEMS TO THE MSB ROOM

LIGHTING:
- 3x LIGHT FIXTURES TYPE B1 AND 1x TYPE B1-E
- 2-WAY LIGHT SWITCHES
- 2x EXIT LIGHTS TYPE EX2
- 1x 1PH 20A NON-ESSENTIAL POWER SUB-CIRCUITS FROM THE CLOSEST EDB

POWER:
- 3xDGPO, ALLOW FOR 1x 1PH 20A NON-ESSENTIAL POWER SUB-CIRCUITS FROM THE CLOSEST EDB

EXTERNAL MSB ROOM:
- MIN INTERNAL DIMENSIONS: 3.57m (W) x 4.37m (L) x 3.2m (H)
- 2H FIRE RATED
- 2 DOORS (SINGLE & DOUBLE) SPACED WELL APART FOR EGRESS
- SMOKE-SEALED DOORS AND NON-COMBUSTIBLE INTERNAL LINEN
- HOUSES:
* MSB1 TO SERVE NEW BUILD
* PFC/AHF CONNECTED TO THE MSB1
* SPACE FOR FUTURE MSB2 TO SERVE FUTURE STAGES
* SPACE FOR AUTHORITY METERING
* SPACE FOR FUTURE PFC/AHF TO SERVE FUTURE STAGES

1 X 1000 KVA KIOSK SUBSTATIONS:
- NEW 5.3W x 6L m EASEMENT & SUBSTATION TO BE OVER 1:100Y FLOOD LEVEL SPACING FOR A SECOND FUTURE KIOSK SUBSTATION TO SERVE FUTURE STAGES.
- 2H FR ZONE WITHIN 3m FROM THE SUBSTATIONS, WHICH SHALL BE CONTAINED WITHIN THE HOSPITAL PROPERTY BOUNDARY. ANY STRUCTURE WITHIN THIS ZONE SHOULD BE 2H FR AND 2kPA BLAST-PROOF.
- NO VENTILATION SYSTEMS ALLOWED WITHIN 6 m FROM THE SUBSTATION
- NO HYDRANTS OR BOOSTERS PERMITTED WITHIN 10 m FROM THE SUBSTATION
- 4.5m WIDE RIGHT OF WAY IS REQUIRED THROUGH THE EXISTING ROAD AND CARPARK TO THE FRONTAGE OF THE KIOSK SUBSTATION
- SUBSTATION SUB-1 TO SERVE THE EXISTING CAMPUS, NEW BUILD AND CESSNOCK HOUSE
- EXISTING 800 kVA SUBSTATION TO BE DECOMMISSIONED AFTER NEW1000 kVA SUBSTATION IS OPERATIONAL
- REFER TO THE ASP LEVEL 3 DESIGN IN DWG CHR-EL-DRG-80XXXX SERIES

EXISTING AUSGRID POWER & STREET LIGHT POLE TO BE RETAINED. REFER TO THE ASP3 DESIGN FOR FURTHER DETAILS

EXISTING FLOODLIGHTS SERVING THE EXISTING CARPARK TO BE RETAINED. EXISTING EASTERN CARPARK AND PROPOSED LOADING DOCK ARE OUT OF THE SCOPE FOR EXTERNAL LIGHTING PURPOSES. AS AGREED WITH THE CLIENT. HOWEVER, ALLOW FOR LIGHT POLES TYPE P2 (1x) AND P4 (1x), 80m OF TRENCHING FROM MSB ROOM, 1x20A 1PH LIGHTING SUB-CIRCUIT AND RCBO.

EXISTING NBN/TELSTRA LEAD-IN SERVICE FROM VIEW ST TO BE RETAINED

10 5 0 10 20 30 40 m

1 : 500-A1 1 : 1000-A3

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TO BE PRINTED IN COLOUR

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
P1	10.05.24	50% SCHEMATIC DESIGN	J.G.
P2	07.06.24	80% SCHEMATIC DESIGN	J.G.
P3	26.07.24	100% SCHEMATIC DESIGN	J.G.
P4	23.08.24	50% DESIGN DEVELOPMENT	J.G.
P5	20.09.24	80% DESIGN DEVELOPMENT	J.G.
P6	27.09.24	WIP DD ISSUE	J.G.
P7	11.10.24	WIP DD ISSUE	J.G.

NOTES:

1. PROVIDE ADDITIONAL CABLING, PITS, AND CONDUITS AS SHOWN TO SUPPORT EXTERNAL LIGHTING, CCTV, SECURITY, WI-FI, ELECTRIC VEHICLE CHARGING STATIONS (EVCS) AND CARPARK MANAGEMENT SYSTEM.
2. CONDUITS ROUTES ARE INDICATIVELY ONLY. THE EXACT LOCATION OF THE CONDUITS AND PITS TO BE DETERMINED ON SITE. CONTRACTOR TO INSTALL THE CONDUITS IN SPLAYED/STACKED CONFIGURATION BASED ON THE SITE CONDITIONS. CONDUIT SIZES SHALL BE DESIGNED BY THE CONSTRACTOR AS PER THE CIRCUITS AND SITE CONDITIONS AND REQUIREMENTS.
3. COORDINATE THE POSITIONING OF THE MAIN SITE INFRASTRUCTURE WITH LIGHTING, SMALL POWER, COMMUNICATIONS AND SECURITY AND OTHER SERVICES.
4. REFER TO ESSENTIAL ENERGY ASP LEVEL 3 DETAILS FOR EASEMENTS AND FURTHER DETAILS IN THE DWG CHR-EL-DRG-80xxxx SERIES.
5. ALL PITS ARE TO BE COMPLETE WITH DRAINAGE. COORDINATE INTERFACES ARE SUITABLE SOLUTIONS WITH CIVIL AND HYDRAULIC TRADES.
6. ALL CONDUITS TO BE INSTALLED TO AVOID STRUCTURAL ELEMENTS AND LIFT PITS, ETC
7. CONDUITS ENTERING A BUILDING FROM ACCESS HOLE OR PITS SHALL BE APPROPIATELY INSTALLED AND/OR PLUGGED WITH MANUFACTURED PRE-FABRICATED PLUGS/CAPS AT THE TURN UP END INSIDE THE ROMO TO INHIBIT THE ENTRY OF FLUID, GAS, RODENTS INTO THE BUILDING.
8. CONDUITS SHALL BE TRENCHED DEEP ENOUGH TO PROVIDE A MINIMUM OF 500mm (COMMS) OR 600mm (POWER) COVER ABOVE THE CONDUIT. THE CONDUITS SHALL BE BEDDED ON TOP OF 100mm OF SAND, COVERED WITH 100mm OF SAND & 200mm OF CLEAN FILL. PROVIDE COMMS/ELECTRICAL WARNING MARKER TAMPE BOVE CLEAN FIELD, WHICH SHALL BE 200mm BELOW FFL.

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PROJECT
CESSNOCK HOSPITAL REDEVELOPMENT

24 VIEW ST, CESSNOCK NSW 2325

TITLE
ELECTRICAL SERVICES
EXTERNAL SERVICES SITE PLAN - LEVEL 1

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	A.B.	SCALE @ A1
CHECKED	J.G.	
APPROVED	J.H.	As indicated
CREATED	MAY 2024	
JOB No.	220549	

DRAWING No. CHR-EL-DRG-010100
REV P7

EXTERNAL LIGHTING LEGEND

Post-top light fixture type:
AEC illuminazione i-Tron series
P1- 8m height - 132W back-to-back - 3000k
P3- 8m height - 132W single - 3000k
P5- 6m height - 100W back-to-back - 3000k
P6- 6m height - 100W single - 3000k
P7- 6m height - 67W single - 3000k

Feature post top light fixture type:
Arcluce Lunio 7
P8- 4m height - 21W - 3000k

Feature LED bollard type:
Arclude Klou 180
BL1 - 1m height - 21W - 3000k

Wall-mounted floodlight fixture
AEC illuminazione MX Pro series
W1 - 290x215x150mm - 29W - 3000k

Wall-mounted brick light fixture
Cree Dot Wall
W2 - 290x215x150mm - 29W - 3000k

INDICATIVE PROPOSED SPACE FOR PV SYSTEM:
- THESE HATCHED AREAS WOULD PROVIDE SPACE TO ACCOMMODATE A PV SYSTEM UP TO 224 kW PV SYSTEM BASED ON 448 x 500W PV PANELS.
- THIS PV SYSTEM SIZE WILL NEED TO BE REVISITED ONCE COORDINATION WITH OTHER SERVICES OCCURS, AS LOCATION OF VENT PIPES AND MECH RISERS MAY IMPACT THE OVERALL AREA AVAILABLE AND THE FINAL PV SYSTEM SIZE

EXTERNAL LIGHT FIXTURES TYPE W1 MOUNTED AT 8.2m AFFL ON L1 ROOF ARE TO SERVE THE NORTHERN DRIVEWAY; CONTRACTOR TO ALLOW COORDINATING WITH ARCHITECT AN ALTERNATIVE LOCATION, QUANTITY AND OUTPUT FOR THESE TO BE MOUNTED AT 3.2m AFFL FROM THE L1 SLAB SOFFIT

ANTENNA APPROXIMATE DIMENSIONS:
910L x 230W x 100H mm

NEWCASTLE ANTENNA
19km away
ANTENNA REQUIRES LINE OF SIGHT TO ORIENTATION

JURD STREET

FOSTER STREET

VIEW STREET

10 5 0 10 20 30 40 m

1 : 500-A1 1 : 1000-A3

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REVISIONS / AMENDMENTS

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P1	10.05.24	50% SCHEMATIC DESIGN	J.G.
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P4	23.08.24	50% DESIGN DEVELOPMENT	J.G.
P5	20.09.24	80% DESIGN DEVELOPMENT	J.G.
P6	11.10.24	WIP DD ISSUE	J.G.

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PROJECT
CESSNOCK HOSPITAL REDEVELOPMENT

24 VIEW ST, CESSNOCK
NSW 2325

TITLE
ELECTRICAL SERVICES
SITE PLAN - ROOF

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	A.B.	SCALE @ A1
CHECKED	J.G.	
APPROVED	J.H.	1 : 500
CREATED	MAY 2024	
JOB No.	220549	

DRAWING No. CHR-EL-DRG-010300
REV P6

EXTERNAL LIGHTING CONTROL LEGEND

PEDESTRIAN PATHWAYS IN ACCORDANCE WITH AS/NZS 1158.3.1 CATEGORY PP4

AVERAGE HORIZONTAL ILLUMINANCE (lx)	POINT HORIZONTAL ILLUMINANCE (lx)	ILLUMINANCE HORIZONTAL UNIFORMITY
1.5	0.25	5

CARPARK LIGHTING IN ACCORDANCE WITH AS/NZS 1158 CATEGORY PC2
AFTER 12AM LIGHTING TO DIM DOWN TO COMPLY WITH PC3 CATEGORY UNTIL MOTION SENSOR DETECTS MOVEMENT AND DIMS UP FOR 30 MINUTES.

	AVERAGE HORIZONTAL ILLUMINANCE (lx)	POINT HORIZONTAL ILLUMINANCE (lx)	ILLUMINANCE HORIZONTAL UNIFORMITY
PC2	7	1	8
PC3	3.5	0.7	8

CARPARK LIGHTING IN ACCORDANCE WITH AS/NZS 1158 CATEGORY PCD

AVERAGE HORIZONTAL ILLUMINANCE (lx)	POINT HORIZONTAL ILLUMINANCE (lx)	ILLUMINANCE HORIZONTAL UNIFORMITY
≥ 14 AND ≥ (Eh)	-	-

POINT HORIZONTAL ILLUMINANCE SHALL BE DETERMINED FOR EACH PCD AREA IN THE CARPARK AND, IN EACH CASE IT SHALL BE GREATER THAN THE VALUE STATED AND GREATER THAN THE AVERAGE FOR THE OVERALL CARPARK

CARPARK LIGHTING IN ACCORDANCE WITH AS/NZS 1158 CATEGORY PCX

AVERAGE HORIZONTAL ILLUMINANCE (lx)	POINT HORIZONTAL ILLUMINANCE (lx)	ILLUMINANCE HORIZONTAL UNIFORMITY
21	5	8

THIS LEVEL SHALL BE USED FOR ANY MARKED AREAS FOR PEDESTRIANS TO CROSS

EXTERNAL CARPARK LIGHTING IN ACCORDANCE WITH AS/NZS 4485
AFTER 12AM LIGHTING TO DIM DOWN BY 50% UNTIL MOTION SENSOR DETECTS MOVEMENT AND DIMS UP FOR 30 MINUTES

	AVERAGE HORIZONTAL ILLUMINANCE (lx)	POINT HORIZONTAL ILLUMINANCE (lx)
CARPARK (OUTDOORS)	20	10

EXTERNAL WALKWAY LIGHTING IN ACCORDANCE WITH AS/NZS 4485

	AVERAGE HORIZONTAL ILLUMINANCE (lx)	POINT HORIZONTAL ILLUMINANCE (lx)
WALKWAY	20	10

EXTERNAL ENTRY LIGHTING IN ACCORDANCE WITH AS/NZS 4485

	AVERAGE HORIZONTAL ILLUMINANCE (lx)	POINT HORIZONTAL ILLUMINANCE (lx)
AREAS ADJACENT TO ENTRY/EXIT	50	30

AMBULANCE BAY LIGHTING - BETWEEN THE AMBULANCES AND THE BUILDING
AS/NZS 1680.2.5 - TABLE F1 2.1 GENERAL PATIENT TRANSIT AREA
MAINTAINED ILLUMINANCE 240LX

ENCLOSED LINK BRIDGE - INTERNAL BOH CORRIDOR
AS/NZS 1680.2.1 - TABLE D1 - 2.1 CORRIDORS AND PASSAGE WAYS
MAINTAINED ILLUMINANCE 40LX

EXTERNAL PLANT ROOMS - INTERNAL
AS/NZS 1680.2.1 - TABLE D1 - 9 PLANT ROOMS
MAINTAINED ILLUMINANCE OF 160LX IN FRONT OF CONTROL PANELS AND 80LX ELSEWHERE

BIKE STORE - INTERNAL
AS/NZS 1680.2.1 - TABLE D1 - 8.1(b) STOREROOM
MAINTAINED ILLUMINANCE OF 80LX

GRASS LANDSCAPE

JURD STREET

REFER TO CHR-RL-DRG-110XXXX SERIES FOR INTERNAL LIGHTING CONTROL ZONES

FOSTER STREET

LOADING ZONE 3 SPACES

EXISTING ED CARPARK AND FUTURE LOADING DOCK IS EXCLUDED FROM THE ELECTRICAL SCOPE FOR LIGHTING PURPOSE. REFER TO DWG CHR-EL-DRG-010100 FOR ALLOWANCES FOR TENDER PURPOSES FOR THIS SPACE

TRANSFER VEHICLE

VIEW STREET

10 5 0 10 20 30 40 m

1 : 500-A1 1 : 1000-A3

EXTERNAL LIGHTING CONTROL ZONES AS 4485

SCALE 1 : 500

TO BE PRINTED IN COLOUR

REVISIONS / AMENDMENTS

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P1	07.06.24	80% SCHEMATIC DESIGN	J.G.
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P4	20.09.24	80% DESIGN DEVELOPMENT	J.G.
P5	11.10.24	WIP DD ISSUE	J.G.

NOTES

1. FOR LEGEND AND NOTES, REFER TO DRAWING CHR-EL-DRG-000001.
2. THE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE JHA SPECIFICATION AND DRAWINGS FROM OTHER TRADES, dRofUS / AushHFGS, ARCHITECTURAL DOCUMENTATION AND THE FULL SUITE OF NSW HEALTH INFRASTRUCTURE DOCUMENTATION (INCLUSIVE OF THE ENGINEERING SERVICES GUIDELINES, ICT CABLING STANDARDS, DESIGN GUIDELINES NOTES, ETC).
3. FOR INTERNAL LIGHTING CONTROL ZONES, REFER TO DRAWINGS CHR-EL-DRG-110000, CHR-EL-DRG-110100 & CHR-EL-DRG-110200 FOR FURTHER DETAILS.
4. THE LIGHTING CONTROL FOR EXTERNAL AREAS IS TO BE VIA AN INTELLIGENT LIGHTING CONTROL SYSTEM WITH THE COMBINATION OF A PE CELL, TIMECLOCK AND OVERRIDE SWITCH WITHIN THE SECURITY CONTROL ROOM IN THE NEW BUILDING.

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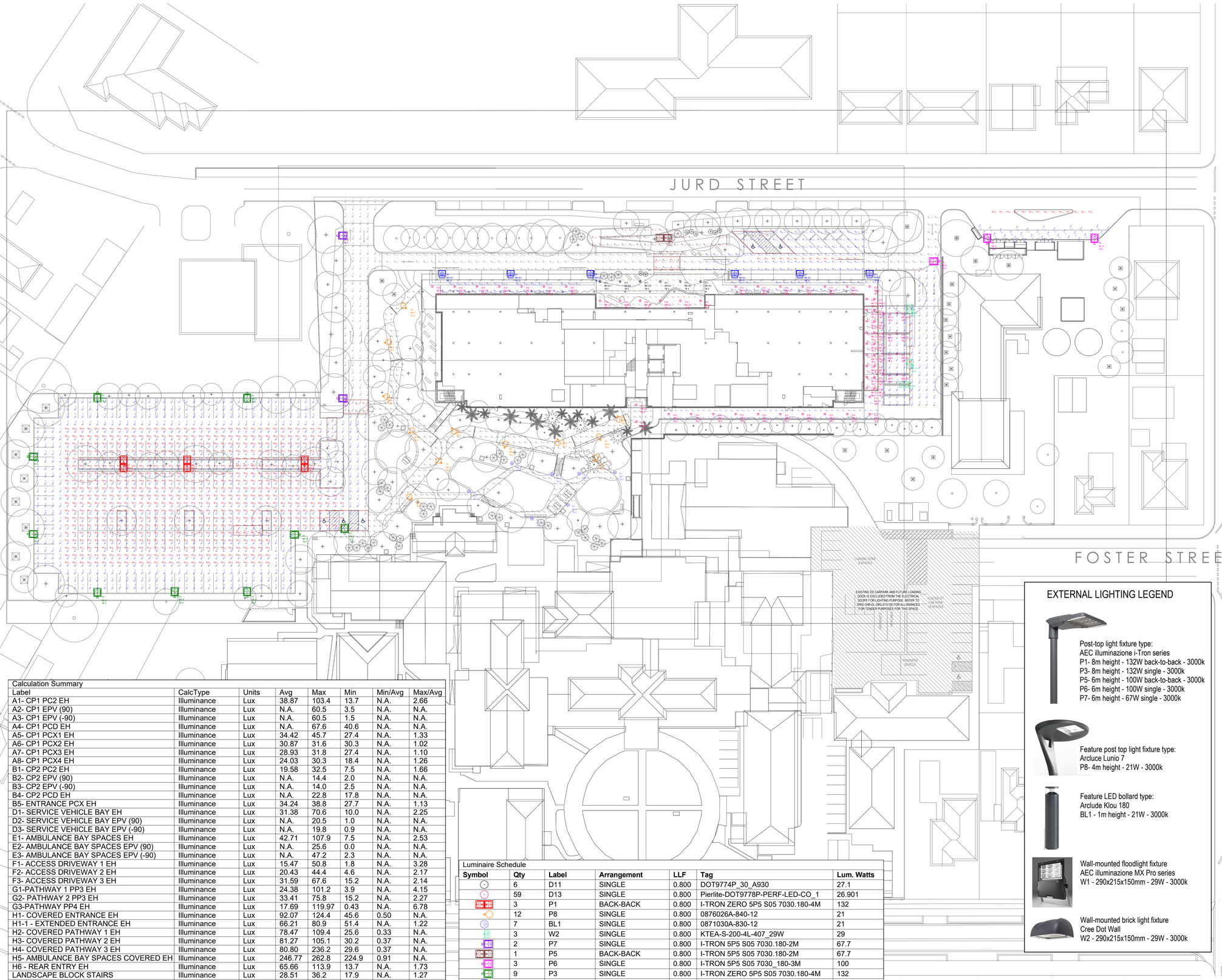
NSW 2325

TITLE
ELECTRICAL SERVICES
EXTERNAL LIGHTING CONTROL ZONES

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	A.B.	SCALE @ A1
CHECKED	J.G.	
APPROVED	J.H.	As indicated
CREATED	MAY 2024	
JOB No.	220549	
DRAWING No.		REV
CHR-EL-DRG-010101		P5

APPENDIX C – PRELIMINARY EXTERNAL LIGHTING CALCULATIONS



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.

TO BE PRINTED IN COLOUR

REVISIONS / AMENDMENTS

Rev	Date	Description	Verified
A	23.10.24	100% DESIGN DEVELOPMENT	J.G.

NOTES

1. FOR LEGEND AND NOTES, REFER TO DRAWING CHR-EL-DRG-000001.
2. THE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE JHA SPECIFICATION AND DRAWINGS FROM OTHER TRADES, dROFUS / AusHFGS, ARCHITECTURAL DOCUMENTATION AND THE FULL SUITE OF NSW HEALTH INFRASTRUCTURE DOCUMENTATION (INCLUSIVE OF THE ENGINEERING SERVICES GUIDELINES, ICT CABLING STANDARDS, DESIGN GUIDELINES NOTES, ETC).
3. FOR INTERNAL LIGHTING CONTROL ZONES, REFER TO DRAWINGS CHR-EL-DRG-110000, CHR-EL-DRG-110100 & CHR-EL-DRG-110200 FOR FURTHER DETAILS.
4. THE LIGHTING CONTROL FOR EXTERNAL AREAS IS TO BE VIA AN INTELLIGENT LIGHTING CONTROL SYSTEM WITH THE COMBINATION OF A PE CELL, TIMECLOCK AND OVERRIDE SWITCH WITHIN THE SECURITY CONTROL ROOM IN THE NEW BUILDING.

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Min/Avg	Max/Avg
A1- CP1 PC2 EH	Illuminance	Lux	38.87	103.4	13.7	N.A.	2.66
A2- CP1 EPV (90)	Illuminance	Lux	N.A.	60.5	3.5	N.A.	N.A.
A3- CP1 EPV (-90)	Illuminance	Lux	N.A.	60.5	1.5	N.A.	N.A.
A4- CP1 PCD EH	Illuminance	Lux	N.A.	67.6	40.6	N.A.	N.A.
A5- CP1 PCX1 EH	Illuminance	Lux	34.42	45.7	27.4	N.A.	1.33
A6- CP1 PCX2 EH	Illuminance	Lux	30.87	31.6	30.3	N.A.	1.02
A7- CP1 PCX3 EH	Illuminance	Lux	28.93	31.8	27.4	N.A.	1.10
A8- CP1 PCX4 EH	Illuminance	Lux	24.03	30.3	18.4	N.A.	1.26
B1- CP2 PC2 EH	Illuminance	Lux	19.58	32.5	7.5	N.A.	1.66
B2- CP2 EPV (90)	Illuminance	Lux	N.A.	14.4	2.0	N.A.	N.A.
B3- CP2 EPV (-90)	Illuminance	Lux	N.A.	14.0	2.5	N.A.	N.A.
B4- CP2 PCD EH	Illuminance	Lux	N.A.	22.8	17.8	N.A.	N.A.
B5- ENTRANCE PCX EH	Illuminance	Lux	34.24	38.8	27.7	N.A.	1.13
D1- SERVICE VEHICLE BAY EH	Illuminance	Lux	31.38	70.6	10.0	N.A.	2.25
D2- SERVICE VEHICLE BAY EPV (90)	Illuminance	Lux	N.A.	20.5	1.0	N.A.	N.A.
D3- SERVICE VEHICLE BAY EPV (-90)	Illuminance	Lux	N.A.	19.8	0.9	N.A.	N.A.
E1- AMBULANCE BAY SPACES EH	Illuminance	Lux	42.71	107.9	7.5	N.A.	2.53
E2- AMBULANCE BAY SPACES EPV (90)	Illuminance	Lux	N.A.	25.6	0.0	N.A.	N.A.
E3- AMBULANCE BAY SPACES EPV (-90)	Illuminance	Lux	N.A.	47.2	2.3	N.A.	N.A.
F1- ACCESS DRIVEWAY 1 EH	Illuminance	Lux	15.47	50.8	1.8	N.A.	3.28
F2- ACCESS DRIVEWAY 2 EH	Illuminance	Lux	20.43	44.4	4.6	N.A.	2.17
F3- ACCESS DRIVEWAY 3 EH	Illuminance	Lux	31.59	67.6	15.2	N.A.	2.14
G1-PATHWAY 1 PP3 EH	Illuminance	Lux	24.38	101.2	3.9	N.A.	4.15
G2- PATHWAY 2 PP3 EH	Illuminance	Lux	33.41	75.8	15.2	N.A.	2.27
G3-PATHWAY PP4 EH	Illuminance	Lux	17.69	119.97	0.43	N.A.	6.78
H1- COVERED ENTRANCE EH	Illuminance	Lux	92.07	124.4	45.6	0.50	N.A.
H1-1 - EXTENDED ENTRANCE EH	Illuminance	Lux	66.21	80.9	51.4	N.A.	1.22
H2- COVERED PATHWAY 1 EH	Illuminance	Lux	78.47	109.4	25.6	0.33	N.A.
H3- COVERED PATHWAY 2 EH	Illuminance	Lux	81.27	105.1	30.2	0.37	N.A.
H4- COVERED PATHWAY 3 EH	Illuminance	Lux	80.80	236.2	29.6	0.37	N.A.
H5- AMBULANCE BAY SPACES COVERED EH	Illuminance	Lux	246.77	262.8	224.9	0.91	N.A.
H6 - REAR ENTRY EH	Illuminance	Lux	65.66	113.9	13.7	N.A.	1.73
LANDSCAPE BLOCK STAIRS	Illuminance	Lux	28.51	36.2	17.9	N.A.	1.27
LANDSCAPE STAIRS	Illuminance	Lux	29.97	88.5	10.8	N.A.	2.95

Luminaire Schedule

Symbol	Qty	Label	Arrangement	LLF	Tag	Lum. Watts
	6	D11	SINGLE	0.800	DOT9774P_30_A930	27.1
	59	D13	SINGLE	0.800	Pierlite-DOT9778P-PERF-LED-CO_1	26.901
	3	P1	BACK-BACK	0.800	I-TRON ZERO 5P5 S05 7030.180-4M	132
	12	P8	SINGLE	0.800	0876026A-840-12	21
	7	BL1	SINGLE	0.800	0871030A-830-12	21
	3	W2	SINGLE	0.800	KTEA-S-200-4L-407_29W	29
	2	P7	SINGLE	0.800	I-TRON 5P5 S05 7030.180-2M	67.7
	1	P5	BACK-BACK	0.800	I-TRON 5P5 S05 7030.180-2M	67.7
	3	P6	SINGLE	0.800	I-TRON 5P5 S05 7030_180-3M	100
	9	P3	SINGLE	0.800	I-TRON ZERO 5P5 S05 7030.180-4M	132
	6	W1	SINGLE	0.800	MX PRO 1 5P5 AS-65W 7030.180-3M	100

EXTERNAL LIGHTING LEGEND

Post-top light fixture type:
AEC illuminazione i-Tron series
P1- 8m height - 132W back-to-back - 3000k
P3- 8m height - 132W single - 3000k
P5- 6m height - 100W back-to-back - 3000k
P6- 6m height - 100W single - 3000k
P7- 6m height - 67W single - 3000k

Feature post top light fixture type:
Arcluce Lunio 7
P8- 4m height - 21W - 3000k

Feature LED bollard type:
Arclude Klou 180
BL1 - 1m height - 21W - 3000k

Wall-mounted floodlight fixture
AEC illuminazione MX Pro series
W1 - 290x215x150mm - 29W - 3000k

Wall-mounted brick light fixture
Cree Dot Wall
W2 - 290x215x150mm - 29W - 3000k

10 5 0 10 20 30 40 m

1 : 500-A1 1 : 1000-A3

PROJECT MANAGER
Turner & Townsend

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NSW 2325

TITLE
NOT USED
EXTERNAL LIGHTING

PRELIMINARY ISSUE
NOT TO BE USED FOR CONSTRUCTION

DRAWN	A.B.	SCALE @ A1
CHECKED	J.G.	1:500
APPROVED	J.H.	
CREATED	MAY 2024	
JOB No.	220549	
DRAWING No.		REV
CHR-EL-DRG-010102		A

APPENDIX D - MITIGATION MEASURES

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
D	An Application for Connection (AFC) has been lodged with Ausgrid, along with the Proposed Design Scope (PDS) and estimated maximum demand for the campus. Ausgrid's reply was received as a Design Information Package (DIP) outlining that no upgrades to the existing HV feeder are required. Further to this, JHA has submitted the ASP3 Design Documentation to Ausgrid for review in a couple of occasions, and the feedback has been minor.	Section 3 and Appendix A – Latest JHA ASP Level 3 Design Documentation package
D	Coordination with the Acoustic Consultant in order to mitigate the noise produced by the stand-by diesel generator located on the roof of the New Build	Section 3
D/O	Especial considerations are undertaken to minimise the light spill from the external lighting towards the residential neighbours surrounding the hospital campus, such as: • All the external light fixtures are to be dimmable to allow adjusting their light output to suit the requirements of the hospital • Provisions of an intelligent lighting control system to provide flexibility to the output and operation of the light fixtures via a timeclock and PE cell • Introduction of motion sensors and back glare shields to certain light fixtures to reduce even further the potential light spill to neighboured properties	Section 3.7 and Appendix C – Preliminary External Lighting Calculations
C/O	Coordination with the LHD and other stakeholders will take place to ensure that the power disruptions due to the new kiosk substation installation are reduced to a minimum by the provision of temporary diesel generators.	Section 3
C/O	Due to the demolition works, a diversion of the optic fibre and copper link from the PABX room to the Cessnock House will be required. Coordination between the LHD and contractors should take place to minimise the disruption in the normal operations of Cessnock House	Section 3
D/O	It has been agreed with the LHD the implementation of a Active Load Management System (ALMS) to the Electric Vehicle Charging (EVC) System in order to cap the overall output of the system should the capacity of the kiosk substation (and estimated maximum demand) is close to be occur. A link between the energy meter within the MSB and the DB-EV (via the BMS) will enable the monitoring at real time of the electrical load of the campus, and the ALMS will be able to adjust the demand of the EVC Stations to suit. However, it is understood that the EVC will be used to charge the NSW Health EV fleet overnight, when the hospital demand will likely not be at the peak	Section 3
O	The LHD will implement an operational plan to source and install the temporary diesel generator and connect it to the Generator Link Box in case of a power failure during a maintenance (or failure) of the stand-by diesel generator	Section 3