Concord Hospital Stage D2
Forensic Mental Health Unit

Electrical, ICT & Security Services

Design Development Report

Prepared for: Health Infrastructure C/ BD Infrastructure

Attention: NBRS Architecture

Date: 13 October 2023

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Ref: 301351044

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Revision

Revision	Date	Comment	Prepared By	Approved By
1	06/10/2023	Draft Issue	AW	PM
2	13/10/2023	Final Issue	AW	PM

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1. Executive Summary

ITEMS HIGHLIGHTED REQUIRE CONFIRMATION / DESIGN RESOLUTION

The Electrical Engineering Report addresses the following main elements:

- Electrical, ICT and Security requirements of Australasian Health Facility Guidelines, NSW Health Engineering Services Guidelines, and the NSW Health ICT Cabling Standard
- Outlines required site infrastructure works to accommodate the proposed Schematic Design Plans

Early Works

As part of Early Works and prior to demolition, the following services diversions will be required:

- Relocate existing HV cables outside the proposed building footprint. Refer to Section 6.1.
- Change fuses to 1200 Amp in Ausgrid Substation S.35340. Refer to Section 7.3.1
- Relocate existing communications conduits outside the proposed building footprint. Refer to Section 6.4.

Electrical Supply Demand

The proposed CFMH Building has a core scope GFA of approximately 4,700 m^2.

The estimated electrical maximum demand for the new CFMH Building is 378 Amps (262 kVA).

Refer to **Appendix D** for the preliminary maximum demand calculation.

11kV/400V Substations

Based on initial enquiries, Ausgrid advised that augmentation works are required (i.e., relocation of existing HV cables) to facilitate the proposed CFMH building. Refer to **Appendix E** for Ausgrid's Design Services Offer received 20/10/2022.

A site walk was conducted with hospital engineering on 27/10/2022 and Stantec were advised of the under supply to MSB No. 3 and its associated buildings by Substation S.35341. Refer to **Section 6.3** for details.

A Preliminary Enquiry was submitted to Ausgrid on 02/11/2022 to determine the available capacities of Ausgrid substations S.35340 and S.35341. Refer to **Appendix A** for the response received from Ausgrid on 16/11/2022.

Based on the response received, the available capacities of Ausgrid substations S.35340 and S.35341 are as follows:

- Ausgrid substations S.35340 – 320 Amps.
- Ausgrid substations S.35341 – Nil.

The response received from Ausgrid to the preliminary enquiry, provides further evidence that the capacity of existing substation 35341 is insufficient to support MSB No. and its associated buildings. The low voltage distribution originating from substation S.35341 only has a 1000 Amp fuse installed, however an MDI reading on this distributor indicates a load in the order of 1100 Amps.

The following proposed supply options need to be reviewed with NSW Health Infrastructure:

- Option 1 (Substation S.35340 Hospital Rd No 3) – Refer to Section 7.3.1 for additional details
  - Change substation fuses to 1200amp and increase SPD setting to 1100amps
- Option 2 (Substation S.35340 Hospital Rd No 3) – Refer to Section 7.3.1 for additional details
  - Upgrade substation to 1000kVA and a 1600/400/400 LV board
- Option 3 (Substation S.35341 Hospital Rd No 4) – Refer to Section 7.3.1 for additional details
  - Upgrade substation to 1500kVA

Based on the refined electrical maximum demand of 378 Amps (262 kVA), preferred and endorsed supply option is Option 1.

DEP Consulting have been engaged to complete the L3 ASP design. The certified design is expected to be complete in December 2023.

Low Voltage (400V) Main Switchboards

Upgrading the existing fuses within existing kiosk substation S.35340 (Refer to Section 7.3.1 – Option 1) will require the installation of a new "site" main switchboard to enable separate supplies to be provided to:

- Existing Main Switchboard No. 1 – 800 Amp Supply (MDI reading from Ausgrid of 680 Amps – Refer to **Appendix A**)
- New Concord Forensic Mental Health Building Main Switchboard – 400 Amp Supply

The new "Site" MSB will be provided with a Service Protection Device to comply with the Service and Installation Rules of NSW.

The CFMH building will be served by one (1) new dedicated Electrical Main Switchboard to be located within the main switchroom.

Main switchboards will have a minimum of Form 4a segregation as per AS 61439 with Non-Essential, Essential and Life Safety sections.

Main switchboards will be provided with surge protection.

Main switchboards will be provided with aminimum of 25% spare capacity on all busbar sections and chassis will be provided on each switchboard in accordance with the Engineering Services Guidelines.

Where Main Switchboards (MSB) have essential and life safety sections requiring generator backup, a Synchronised Closed Transition Transfer Switch (SCTTS) will be provided to allow automatic transfer of the power supply from normal to generator.

Main Switchboard(s) will have an allowance for a temporary (mobile) generator to be connected.

Refer to **Appendix F** for proposed location of new main switchroom.

Standby Power Generators

The existing 330kW/413kVA standby rated Kohler KV410 generator adjacent to Building 111 shall be replaced with a new 569kW/711kVA standby rated Himoinsa HSW-660 T5 generator in an acoustic weatherproof canopy and a fuel system including 3000L bulk fuel tank, fuel lines and valves.

The new generator shall be located where the existing 330kW/413kVA standby rated Kohler KV410 generator is located.

The CFMH building does not have a Level 6 intensive care unit and therefore does not require standby power generators in N+1 plant configuration. Standby generators shall be provided in N plant configuration00. As per the NSW Health Engineering Services Guidelines, generator plant will be sized such that they are matched as closely as possible to the actual load.

The new standby generator will have the capacity to provide 100% generator backup to the CFMH building to allow the backup of air conditioning within the patient/consumer areas as requested by the LHD.

The NSW Health Engineering Services Guidelines requires that generators can provide 24 hours of standby power at full load. A double skinned base skid tank with a minimum of 3000L of storage capacity shall be provided as part of the generator enclosure to comply with the ESGs.

Uninterruptible Power Supplies (UPS)

As there will be minimal clinical (medical power) UPS requirements within the CFMH building, it is proposed to provide a single centralised UPS system for both ICT and Medical power (minimum battery autonomy of 15 minutes end of life).

The new centralised Uninterruptible Power Supply (UPS) system will be provided within the Main Switch Room. The new UPS systems will be of N+1 type arrangement.

Consumer Mains

New consumer mains will be provided to the new "Site" Main Switchboard from existing Ausgrid Substation S.35340 and the new standby generator.

The proposed location of the new “Site” Main Switchboard is adjacent to the new Fire Pump Room. Location to be finalised with Architect.

Submains

Submains will be distributed via cable tray or conduits from the main electrical switch room to the distribution boards.

Cabling shall generally consist of XLPE/PVC multicore with different coloured outer sheaths to identify Essential and Uninterruptible Power Supply (UPS) submains.

Electrical cables will meet GBCAs Best Practice Guidelines for PVC in the Built Environment.

Distribution Boards

The CFMH Building shall be served by new dedicated electrical Distribution Boards. Distribution boards shall be minimum Form 2bi, with Form 4aih NHP Grizzbar, Schneider Isobar chassis or approved equivalent. A minimum of 25% spare capacity on all busbar sections and chassis shall be provided on each switchboard in accordance with the Engineering Services Guidelines.

Metering, Energy Monitoring and Power Management

Within the CFMH, facilities for energy monitoring will be provided in accordance with the requirements of the Supply Authority and the NCC 2019 Part J8.3. Energy meters will be configured to enable recording of real-time power and energy data. Energy meters will be interlinked via the building management and control system (BMCS).

Exit and Emergency Lighting

New computer monitored emergency lighting and exit signs will be provided in the new building to comply with AS/NZS 2293.1 and the NCC.

Internal Lighting

The new building will be provided with new energy efficient LED luminaires. Lighting of a specialist nature (e.g., bedhead lights, examination lights, procedure lights) will be provided where required. All patient areas shall utilise luminaires suitable for cyanosis observation in accordance with AS/NZS 1680.2.5.

For mental health areas, the NSW ESG requires that all luminaires and light switches within patient/consumer areas are tamper proof.

All ballasts will be DALI-dimmable electronic and controllable via a lighting control system compatible with AS/NZS 62386.104.

External Lighting

New exterior lighting provided by the project will comply with AS 4282, AS/NZS 1158.3.1 and AS 3000.

Lighting to new and existing external car park areas will be designed to comply with AS 4282, AS/NZS 1158.3.1 and AS 3000.

Landscape lighting will be provided in consultation with the Architects and Landscape consultants. In addition to functional lighting, ambient lighting will be provided to illuminated landscape features and plants.

Lightning Protection

The new CFMH building will be provided with a lightning protection system. A conventional solution in accordance with AS1768 shall be installed; no other solution shall be allowed. The lighting protection system shall have a minimum lightning protection level of IV. Refer to **Appendix G** for Lightning Risk Assessment completed in accordance with AS 1768-2021.

ICT Infrastructure

The redundant backbone cabling system topology recommended in the NSW Health ICT Cabling Standard and indicated below will be implemented within the CFMH building.

The CFMH Redevelopment shall be provided with one (1) dedicated new Building Distributor room. The Building Distributor room will be designed in accordance with the NSW Health ICT Rooms Standard.

It is proposed to establish one (1) new Building Distributor (BD) room within the new CFMH building.

The new Building Distributor room will be connected to the existing Campus Distributors within Building 5 and 58 and the existing PABX within Building 4.

Further investigations are required to determine if there is spare capacity within the existing Campus Distributors to facilitate the new connections.

Floor Distributor (FD) rooms compliant with the NSW Health ICT Rooms Standard will be provided on each level. Telecommunications field outlet cabling throughout the building will originate from these rooms.

Wi-Fi Network

The new CFMH building will be provided with internal Wi-Fi coverage throughout.

The need to ensure Access Points are not readily accessible and cannot be used as ligature points will be included in the determination of the type of Access Point to be used for the CFMH building. As per the AHFG Health Planning Unit 131 Mental Health – Overarching Guideline, they will be installed in ceiling cavities.

External Wi-Fi coverage will be provided to the following areas:

- Courtyards
- Docks and vehicle entry points
- Immediate surrounds of the building (10 metres from wall)

Wi-Fi predicative heat mapping, which will inform the locations of the Wireless Access Points (WAPs), is to be provided by LHD ICT.

In the absence of predictive heat maps, an allowance of one (1) WAP per 70m2 is to be made in accordance with the NSW ESG.

Assistance (Nurse) Call system

A new IP based Nurse Call system shall be installed within the CFMH building.

Patient Entertainment System

The new building will be provided with the infrastructure to allow the implementation of an IP based system solution.

Audio Visual Systems

As per the functional design brief, videoconferencing and teleconferencing will be provided to the following areas:

- mental health tribunal (MHRT)
- teaching including IT resource room and Library/Computer room
- meeting rooms

Audio-visual equipment shall align with NSW eHealth approved hardware list or approved equivalent.

Hearing Augmentation Systems

Hearing augmentation systems shall be provided where an inbuilt amplification system is provided in accordance with the NCC.

Public Address System (PA)

No public address is proposed for the CFMH building.

Security

Concord Repatriation General Hospital campus currently implements the following systems:

- Electronic Access Control – Integriti
- CCTV – Milestone
- Intercom System – AIPhone IX Series

The existing security systems will be extended to the new CFMH building.

CCTV

The existing Milestone Digital Video Management Software (DVMS) shall be extended to the CFMH Building. The existing storage will be expanded as required to provide a minimum of 21 days storage.

New IP based CCTV cameras will be provided as required. Locations of CCTV cameras are to be confirmed with the LHD and User Group.

Access Control & Fixed Duress

The existing Inner Range Integriti Access Control & Fixed Duress system shall be extended to the CFMH Building.

Fixed Duress

Fixed duress buttons will be strategically located throughout the healthcare facility. Final locations will be as per the requirements of the AusHFGs and Project User Group meetings and captured in the Room Data Sheets and Room Layout Sheets.

Mobile Duress

An RTLS grade Wi-Fi duress system will be provided to the new CFMH building. To facilitate this an RTLS grade Wi-Fi network will be installed as per Section 7.22.4.

Intercom

An IP based audio/video system will be provided within the new CFMH building. The existing AIPhone IX series system within will be extended to into the new CFMH building. The intercom system will be integrated into the VoIP system.

Photovoltaic System

The new CFMH building will be provided with a new photovoltaic (PV) system, which will be connected into CFMH building main switchboard. The capacity of the system is approximately 156kW. Refer to **Appendix H** for details.

Mental Health Areas

As per the requirements of the NSW ESG, the following measures will be incorporated in mental health areas:

- Tamper proof luminaires including emergency / exit luminaires
- Socket outlets and light switches to be tamper proof
- Extended UPS autonomy for security systems.

2. Project Overview

2.1 The State-wide Mental Health Infrastructure Program

The NSW Government has committed to a $700M for the State-wide Mental Health Infrastructure Program (SWMHIP) that is responding to recommendations outlined in the Mental Health Commission of NSW's Living Well Strategic Plan for Mental Health 2014 – 2024. The Strategic Plan has identified four core strategies and the Concord Forensic Mental Health Unit is to improve the capacity within the forensic mental health system so that the consumers are treated with the security level required in a facility with appropriate therapeutic environments.

The SWMHIP is also focused on delivering the project in co-design strategy to enhance carer and consumer participation in the design of mental health infrastructure and services.

2.2 Concord Repatriation General Hospital

Concord Repatriation General Hospital (Concord Hospital) is a large multifaceted health facility, located in the western sector of the Sydney Local Health District (SLHD). It is located within the City of Canada Bay Local Government Area (LGA) in Sydney, NSW. Concord Hospital operates as a general hospital building.

In its proud heritage of caring for the Veteran community, it now services the local communities of Concord, Strathfield, Burwood and beyond.

2.3 The Concord Forensic Mental Health Unit

The CFMH Unit is to provide low and medium security departments for the forensic mental health Consumers. The facility is to ensure modern facility is available to support the contemporary model of care with appropriate therapeutic environment and focused on consumer and staff experience.

2.3.1 Key Project Drivers

- Addressing ageing of mental health facilities that no longer provide physical environments that align with contemporary model of care and best practice.
- Supporting the change in delivery of mental health services to focus on person-centred holistic, recovery-oriented practice and trauma informed care.
- Providing the infrastructure to meet growth in forensic patients' numbers.
- Providing infrastructure required to support transition of long stay consumers with complex care issues to high quality, community-based services focussed on a person-centred rehabilitation.
- Delivering infrastructure which has been designed in strong collaboration with people who use, operate, and govern the service. Enhance carer and consumer involvement in overseeing improvements to mental health care through improved opportunities for co-design with service recipients.

2.3.2 Expected Project Benefits

- Improving the mental health care for the forensic consumers.
- Providing modern therapeutic environment suitable for contemporary model of care and best practice
- Creating expanded, modern, and contemporary built environments for both staff and patients.

3. Introduction

Stantec in conjunction with BD Infrastructure and NBRS Architecture, have been commissioned by Health Infrastructure (HI) to prepare a Part 4 Design Development report for the construction of a new Concord Forensic Mental Health Unit (CFMH) which will consolidate and provide a significant increase in the existing health services, improving accessibility and help meet the future demand for healthcare within the district.

The proposed CFMH is to be located within the Concord Repatriation General Hospital Precinct within Mental Health Precinct.

Figure 1 - Proposed site location within Mental Health Precinct in Concord Repatriation General Hospital

3.1 General

The intent of this report is to cover the electrical design options considered as part of the Design Development stage. Stantec has been engaged by HI to prepare a Part 4 Design Development report for the development of the new Concord Forensic Mental Health Unit (CFMH), including investigation of the existing site constraints and to report on any latent conditions that may affect the cost of the proposed project.

These Part 4 Design Development proposals have been developed in line with architectural and procedural developments and this report aims to identify key risks, positives, and negatives for the proposed design so that buildability, cost, energy consumption and safety in regard to electrical systems are not overlooked in the planning stage.

The report covers, but is not limited to, the following:

- HV power infrastructure including transformers, switchboards, cabling, etc.
- LV power infrastructure including switchboards, distribution boards, cabling, etc.
- Standby generating plant
- ICT systems and equipment rooms including campus, building and floor distributors.
- Security systems including access control, CCTV, etc.

It is envisaged that the new building will be classified as a Class 9a Building with a rise in stories of three (3).

3.2 Report Basis

This report has been based on the following:

- Design plans produced by NBRS Architecture.
- Design Development documentation produced by NBRS Architecture.
- Functional Design Briefs.
- Design Team Meetings held to date.
- Input from other design team consultants.
- Focus Group Meetings with Sydney Local Health District held to date.
- Site survey by LTS Lockley

3.3 Limitations of the Report

This report is based on:

- Site visits carried out by Stantec,
- Documentation and information provided by NBRS Architecture
- Documentation and information provided by SLHD Engineering, including, but not limited to:
    - Existing As-Built Plans & Schematics
    - Maximum Demand Profile Reports

Stantec have based our report on the assumption that the information provided can be taken at face value and in general terms accurately reflects the installation on site. Stantec does not accept any liability regarding the accuracy of the existing documentation.

Stantec's site visits involved walks around the site, and overall visual inspections. As such, this report should be read with the limitation of such site visits in mind. Only items visible were considered and where buildings were not being affected as part of the new works the investigation of the building was cursory only.

The investigations have not included a complete examination of all buildings, Stantec did not investigate any non-visible aspects of the installation, and Stantec did not physically verify the capacity of the following installed systems:

- No. of spare ports on all patch panels within all communications racks
- No. of available Rack Units (RUs) within all communications racks.
- Spare capacity of existing inground conduits
- Spare capacity of existing cable tray
- Loads on unmetered electrical switchboards (i.e., no load logging was carried out)
- Existing network coverage of mobile/cellular and non-cellular (GRN, HIRPN, two-way radio) services.

3.4 Design Issues from Part 1 Resolved in Part 2

The following table outlines design issues resolved during Part 2:

Design Item	Resolution
Building Electrification	Fully electrified building taken up as a sustainability initiative.

3.5 Design Issues from Part 2 Resolved in Part 3

The following table outlines design issues resolved during Part 2:

Design Item	Resolution
Normal Mains Supply	Application to be submitted to Ausgrid using revised electrical maximum demand calculation figures. As per previous advice from Ausgrid, this will allow the project to only be required to upgrade the existing fuses in the existing kiosk substation
DAS Target Coverage Area	Target areas to be as per DGN No. 7
Lightning Risk Assessment	A lightning protection system in accordance with AS1768 shall be provided to the new CFMH building. The lighting protection system shall have a minimum lightning protection level of IV

3.6 Design Issues from Part 3 Resolved in Part 4

The following table outlines design issues resolved during Part 2:

Design Item	Resolution
Generator location, connection, supply, and refuelling	Replace existing 330kW/413kVA standby rated Kohler KV410 generator adjacent to Building 111 with new 569kW/711kVA standby rated Himoinsa HSW-660 T5 generator in acoustic weatherproof canopy and fuel system including 3000L bulk fuel tank. New generator to be located where existing 330kW/413kVA standby rated Kohler KV410 generator is located.

3.7 Design items still requiring resolution.

The following items require further consideration:

- Further investigations are necessary to confirm if the existing communications cables need to be relocated outside the proposed building footprint.
- Confirmation from SLHD ICT of where the fibre and copper backbone cabling for the new CFMH building is required to connect back to.
- Confirmation of the location of the existing radio paging HIRPN high-powered transmitter(s).
- Capacity of the photovoltaic system
- Value engineering items in particular rationalisation of electrical power distribution board infrastructure.
- Maintenance and plant replacement strategy of major electrical equipment

3.8 Major Risk Items

The following risk items shall be identified:

Risk Name	Mitigation
Damage to existing services when relocating / diverting existing HV cables	During the site setup and construction works, the contractor will need to mark out the area of the services trench and have appropriate systems in place as to not damage any of the existing services in the vicinity.
Damage to existing services when relocating / diverting existing communications cables	During the site setup and construction works, the contractor will need to mark out the area of the services trench and have appropriate systems in place as to not damage any of the existing services in the vicinity.
Any inground services not identified in the inground services survey due to the technical and physical limitations of non-intrusive technologies (e.g., electromagnetic location equipment and ground penetrating radar).	Stantec have identified optical fibre cables known by SLHD, but the contractor needs to be aware of the limitations of survey technologies and there could be cables unknown to SLHD ICT/Engineering

4. Design Criteria

The Electrical and ICT Services shall comply with, but shall not be limited to, the following relevant Codes and Standards.

- Australian Health Facility Guidelines
- NSW Health Engineering Services Guidelines 2022
- Building Code of Australia 2022
- NSW Health ICT Cabling Standard V4.0
- NSW Health ICT Rooms Standard V4.0
- NSW Health Wi-Fi Standard
- NSW Health Infrastructure Hospital Car Park Design Guidelines
- NSW Health Design Guidance Notes
- Protecting People and Property NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies February 2022
- Mobile Carriers Forum (MCF) 2022 Design Specification for Distributed Antenna Systems

Australian Standards:

- AS/NZS 1158 - Lighting for roads and public spaces
- AS/NZS 1680 – Interior lighting
- AS 1768 – Lightning protection
- AS 1940 – The storage and handling of flammable and combustible liquids
- AS/NZS 2053 - Conduits and fitting for electrical installations
- AS/NZS 2293.1 – Emergency lighting and exit signs for buildings.
- AS/NZS 2500 – Safe use of medical electrical equipment in health care
- AS/NZS 3000 – Electrical installations “Wiring Rules”
- AS/NZS 3003 – Electrical installations - Patient areas
- AS/NZS 3008.1.1 – Electrical installations - Selection of cables– Cables for alternating voltages up to and including 0.6/1kV – Typical Australian installation conditions.
- AS/NZS 3009 – Electrical installations - Emergency power supplies in hospitals
- AS/NZS 3010 – Electrical installations – Generating sets.
- AS/NZS 3013 – Electrical installations - Classification of the fire and mechanical performance of wiring system elements
- ASNZS 3080 - Information technology - Generic cabling for customer premises
- AS/NZS 3084 - Telecommunications installations - Telecommunications pathways and spaces for commercial buildings
- AS/NZS 3085.1 - Telecommunications installations - Administration of communications cabling systems
- AS/NZS 3100 – Approval and test specification - General requirements for electrical equipment
- AS/NZS 5000.1 – Electric Cables – Polymeric insulated – For working voltages up to and including 0.6/1(1.2) kV
- AS/NZS 11801 – Information technology - Generic cabling for customer premises
- AS/NZS 14763.3 – Information technology - Implementation and operation of customer premises cabling - Testing of optical fibre cabling
- AS/NZS ISO/IEC 20000.1 – Information technology - Service management
- AS/NZS 60065 – Audio, video and similar electronic apparatus - Safety requirements
- AS/NZS 60079 Explosive atmospheres
- AS 60529 – Degrees of protection provided by enclosures (IP Code)
- AS 60601 – Medical electrical equipment
- AS/NZS IEC 60601.2.41 – Medical electrical equipment
- AS/NZS 61000 – Electromagnetic compatibility (EMC)
- AS/NZS 61241 Electrical apparatus for use in the presence of combustible dust
- AS/NZS 61439 Low-voltage switchgear and controlgear assemblies
- AS/NZS IEC 61935.1 – Specification for the testing of balanced and coaxial information technology cabling. Installed balanced cabling as specified in ISO/IEC 11801 and related standards.
- AS/NZS IEC 61935.2 – Testing of balanced communication cabling in accordance with ISO/IEC 11801
- AS/NZS 62368.1 – Audio/video, information and communication technology equipment – Safety requirements
- CISPR 32 – Electromagnetic compatibility of multimedia equipment - Emission requirements
- AS/CA S008 – Requirements for customer cabling products
- AS/CA S009 – Installation requirements for customer cabling (Wiring Rules)
- EN 50174 Information technology. Cabling installation. Installation specification and quality assurance
- EN 50346 Information technology. Cabling installation. Testing of installed cabling
- HB 90.3 The Construction Industry Guide to ISO 9001:2000
- TIA/EIA 568-0 – Generic Telecommunications Cabling for Customer Premises
- TIA/EIA 568-1 – Commercial Building Telecommunications Infrastructure Standard
- TIA/EIA 568-2 – Balanced Twisted-Pair Telecommunications Cabling and Components Standard
- TIA/EIA 568-3 – Optical Fiber Cabling and Components Standard
- TIA/EIA 568-4 – Broadband Coaxial Cabling and Components Standard
- TIA/EIA 568-5 – Balanced Single Twisted-pair Telecommunications Cabling and Components Standard

5. Electrical Services Requirements

5.1 Australasian Health Facility Guidelines (AHFGs)

The AHFGs state that Electrical services should be designed to provide:

- safety and reliability.
- capacity for all equipment and plant.
- capacity for expansion.
- flexibility for isolation, shutdown, and maintenance.
- compatibility with existing on-site and facility systems.
- compatibility with provider network.
- cost efficiency.
- minimise electromagnetic interference; and
- distribution systems that will not see all modules of any critical service affected by any one interruption event e.g., modules of intensive care services should not be off a common sub main or one switchboard.

Consideration should be given to the location and requirements for:

- cabling.
- emergency battery supply.
- standby generating plant and fuel supply.
- substations and transformers.
- switchboards; and
- switch rooms.

Electrical supply is governed by supply authority regulations, standards, and client policy. Substations are generally owned by the supply authority. Easements, substation location, security, access and egress for personnel and equipment should be considered.

Attention should be paid to the placement of substations and electrical mains as the former may provide a fire hazard, and both can adversely affect electrical and communications equipment.

5.2 NSW Health Engineering Services Guidelines

The NSW Health Engineering Services Guidelines state:

- Design must be robust and resilient, and consider the services delivered during normal operations, as well as disaster scenarios, as defined for each hospital.
- Designs for infrastructure with useful lives greater than 25 years must consider future adaptability.
- Robustness must consider issues associated with an “All Hazards Approach” and in particular examine the alignment of failure modes, “mean time between failures” and “mean time for repairs” of components to avoid critical failure modes. This is also appropriate for Uninterruptable Power Supplies (UPS) and the like.
- Infrastructure should avoid single points of failures and co-location of critical services or design elements.

5.2.1 Disaster and Emergency Management

The NSW Health Engineering Services Guidelines state *“all hospitals with a level 6 intensive care unit (ICU) shall be considered as hospitals for disaster and emergency management. Any new hospital meeting these criteria shall be provided with back up provisions over and above other hospitals in respect of:*

- *A 24-hour water storage*
- *A 24-hour fuel storage for standby power, and with N+1 plant configuration of standby power generator system*
- *In addition to standby power provisions described in Section 5, the air conditioning to operating theatres, sterile stock rooms, emergency department (including local imaging equipment) and ICU should also be provided with standby power.”*

The new CFMH building will not contain a Level 6 ICU and is therefore not considered a disaster and emergency management hospital.

5.2.2 Security of Supply

The NSW Health Engineering Services Guidelines state: “*In some circumstances the provision of dual supplies to improve electricity supply reliability may be considered. In this case and where practical, feeders should emanate from two independent network circuits and from two different street reticulation routes. Preference should be given to ring main reticulation from multiple sources.”*

5.2.3 Standby Power

The NSW Health Engineering Services Guidelines state: *“Where hospitals cannot function for a time with loss of the external supply, standby power generation regardless of the form of the normal power supply will be provided.”*

Standby electrical power will be provided, and provisions will be guided by the recommendations of AS 3009.

Standby power will also be provided to all subsidiary mechanical, hydraulic and medical gas systems (which are dependent on an electrical power source to operate) and are essential in delivering services to the critical care areas.

Plant Configuration

The CFMH building will be provided with new standby generators in a N plant configuration.

Generator plant will be sized such that they are matched as closely as possible to the actual load.

5.2.4 Fuel Storage

A minimum of 24 hours of fuel storage capacity at full load is required. Larger storage capacity may be provided based on justifiable clinical needs or local factors.

5.2.5 Connection of Temporary Generator

Quick connection facilities (i.e., ‘power lock’ connection or busbar cable connection facility) for linking the loads identified under standby power to a temporary (mobile) generator set will be provided.

Consideration for the unloading and loading of a temporary generator will be considered.

6. Existing Site Infrastructure

ITEMS HIGHLIGHTED REQUIRE CONFIRMATION / DESIGN RESOLUTION

6.1 Existing High Voltage (HV) infrastructure

There are two existing Ausgrid kiosk substations (S.35340 & S.35341) within the vicinity of the proposed building site.

Based on advice from hospital engineering, existing Ausgrid Substation S.35341 supplies Main Switchboard No. 3 (MSB No. 3).

A Preliminary Enquiry was submitted to Ausgrid on 02/11/2022 to determine the available capacities of Ausgrid substations S.35340 and S.35341. Refer to **Appendix A** for the response received from Ausgrid on 16/11/2022.

Based on the response received, the available capacities of Ausgrid substations S.35340 and S.35341 are as follows:

- Ausgrid substations S.35340 – 320 Amps.
- Ausgrid substations S.35341 – Nil.

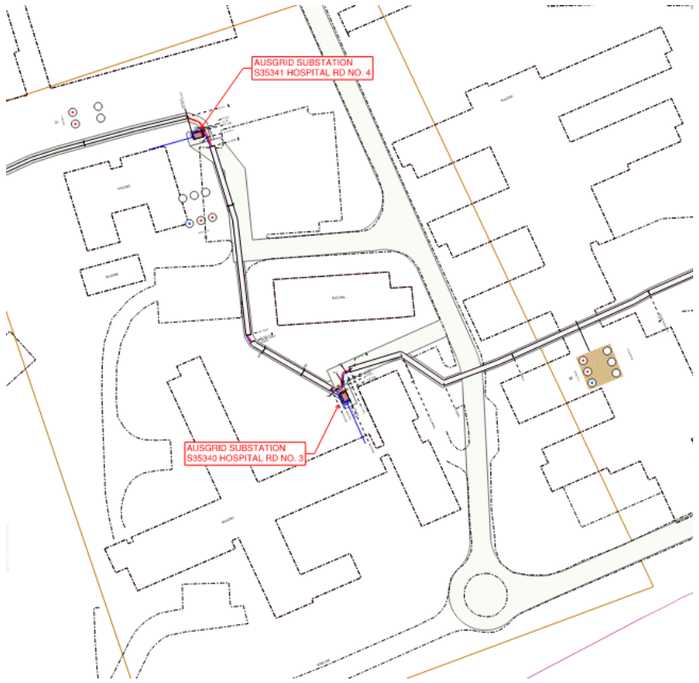


Figure 2- Ausgrid High Voltage (HV) Network Plan

As can be seen in Figure 2, there are existing Ausgrid HV cables that run through the proposed site. To minimise the risk to the project, it is proposed that the existing HV cables between Ausgrid substations S.35340 and S.35341 are relocated outside the proposed building footprint.

6.2 Existing Standby Generators

There are two (2) existing standby generators in the vicinity of the proposed works. There is an existing containerised 140kW/175kVA standby rated Himoinsa HFW-160 T5 generator adjacent to Building 28 that provides back up supply to Building 28. There is also a containerised 330kW/413kVA standby rated Kohler KV410 generator adjacent to Building 111 that provides back up supply to Buildings 108, 109, 110, 111 & 112.

Refer to **Appendix B** for site services plan indicating location of generators.

6.3 Existing Low Voltage (LV) Main Switchboards

There are two (2) existing LV Main Switchboards in the vicinity of the proposed works.

Main Switchboard No. 1 (MSB No. 1) is adjacent to Building 111 and supplies Buildings 108, 109, 110, 111 & 112. There does not appear to be an existing Service Protection Device Installed on MSB No. 1. Any modifications to this main switchboard will require the installation of a Service Protection Device to comply with the Service & Installation Rules of NSW.

Main Switchboard No. 3 (MSB No. 3) is adjacent Building 28 and supplies Buildings 26, 27, 28, 29 & 89. There does not appear to be an existing Service Protection Device Installed on MSB No. 1. Any modifications to this main switchboard will require the installation of a Service Protection Device to comply with the Service & Installation Rules of NSW.

Hospital engineering has advised that MSB No. 3 is under supplied by the existing 800kVA Ausgrid Substation S.35341 and the buildings supplied by this MSB are unable to operate at 100% capacity. The LHD has advised that the 1000 Amp protection fuses within the substation have blown in the past. This is supported by the information provided by Ausgrid in their response to the preliminary enquiry submitted (Refer to **Appendix A**).

Refer to **Appendix B** for site services plan indicating location of main switchboards.

6.4 Existing ICT Infrastructure

There are several existing communications conduits within the proposed building footprint. The existing communications cables within these conduits will likely need to be relocated outside the proposed building footprint.

Further investigations are necessary to confirm if the existing communications cables need to be relocated.

Refer to **Appendix C** for survey drawing which highlights the locations of the existing communications conduits within the proposed building footprint.

6.5 Existing Security Systems

6.5.1 Access Control, CCTV & Duress

Concord Repatriation General Hospital campus currently implements the following systems:

- Electronic Access Control – Integriti
- CCTV – Milestone
- Intercom System – AIPhone IX Series
- Fixed Duress – over the Integriti system

The location and spare capacity of the headend servers for access control and CCTV are to be confirmed.

The existing security systems will be extended to the new CFMH building.

6.5.2 Radio Paging

The Health Interior Radio Paging Network (HIRPN) is the critical messaging network used by Local Health Districts (LHDs). The network provides radio paging services throughout NSW to ensure critical messaging. The radio paging service is managed by third-party provider Ikonix Technology.

Ikonix Technology are currently in the process of upgrading Concord Hospital to its paging service with an aim to go live later this year.

As part of design finalisation and construction, the Contractor is required to confirm if additional receiver and transmitter hardware and antenna systems are required to provide radio paging coverage.

The location of the existing HIRPN high-powered transmitter(s) are to be confirmed with Ikonix Technology or SLHD ICT.

6.5.3 Fixed Duress

Currently, the fixed duress system runs over the Integriti security system sending alarms to security staff via the ICT network.

7. Proposed Electrical Services

ITEMS HIGHLIGHTED REQUIRE CONFIRMATION / DESIGN RESOLUTION

7.1 Early Works

As part of Early Works and prior to demolition, the following services diversions will be required:

- Relocate existing HV cables outside the proposed building footprint. Refer to Section 6.1.
- Change fuses to 1200 Amp in Ausgrid Substation S.35340. Refer to Section 7.3.1
- Relocate existing communications conduits outside the proposed building footprint. Refer to Section 6.4.

7.2 Electrical Supply Demand

The proposed CFMH Building has a core scope GFA of approximately 4,700 m^2.

The estimated electrical maximum demand for the new CFMH Building is 378 Amps (262 kVA).

Refer to **Appendix D** for the preliminary maximum demand calculation.

7.3 11kV/400V Substations

Based on initial enquiries, Ausgrid advised that augmentation works are required (i.e., relocation of existing HV cables) to facilitate the proposed CFMH building. Refer to **Appendix E** for Ausgrid's Design Services Offer received 20/10/2022.

A site walk was conducted with hospital engineering on 27/10/2022 and Stantec were advised of the under supply to MSB No. 3 and its associated buildings by Substation S.35341. Refer to **Section 6.3** for details.

A Preliminary Enquiry was submitted to Ausgrid on 02/11/2022 to determine the available capacities of Ausgrid substations S.35340 and S.35341. Refer to **Appendix A** for the response received from Ausgrid on 16/11/2022.

Based on the response received, the available capacities of Ausgrid substations S.35340 and S.35341 are as follows:

- Ausgrid substations S.35340 – 320 Amps.
- Ausgrid substations S.35341 – Nil.

The response received from Ausgrid to the preliminary enquiry, provides further evidence that the capacity of existing substation 35341 is insufficient to support MSB No. 1 and its associated buildings. The low voltage distribution originating from substation S.35341 only has a 1000 Amp fuse installed, however an MDI reading on this distributor indicates a load in the order of 1100 Amps.

7.3.1 Increased Supply Options

The following proposed supply options were reviewed with NSW Health Infrastructure:

Option 1 (Substation S.35340 Hospital Rd No 3)

- Change substation fuses to 1200amp and increase SPD setting to 1100 Amps.
- Increases spare capacity to approximately 420 Amps (4200m2 x 69VA/m2 = 290kVA = 418 Amps).
- Consumer mains and existing MSB may need to be upgraded.
- Separate Ausgrid contestable project required to resolve existing undersupply issue of MSB No.3 by substation S.35341.

Option 2 (Substation S.35340 Hospital Rd No 3)

- Upgrade substation to 1000kVA and a 1600/400/400 LV board
- 1600 Amp fused direct distributor to be provided.
- Increases capacity available to CFMH building to approximately 920 Amps (1600A – 680A = 920A).
- Consumer mains will need to be upgraded.
- New MSB within CFMH will need to feed existing MSB No. 1
- Separate Ausgrid contestable project required to resolve existing undersupply issue of MSB No.3 by substation S.35341.

Option 3 (Substation S.35341 Hospital Rd No 4)

- Upgrade substation to 1500kVA
- 2000 Amp fused direct distributor to be provided.
- Increases capacity available to CFMH building & MSB No.3 to approximately 920 Amps (2000A – 1100A = 900A).
- Consumer mains will need to be upgraded.
- MSB No.3 will need to be upgraded to comply with current standards (i.e., Service Protection Device, etc) and to feed new CFMH building.
- Single Ausgrid contestable project required to resolve existing undersupply issue of MSB No.3 by substation S.35341 and supply to new CFMH.
- Project is not required to resolve the undersupply issue of MSB No. 3. It would be expected that the SLHD contributes towards funding this option.
- Further information needs to be provided to Ausgrid to determine if this option is feasible.
- Stantec note that there are potential cost efficiencies in combining the augmentation works required to remediate the under supply of MSB No.3 and to provide a new supply to the new CFMH building.

7.3.2 Health Infrastructure Endorsed Option

Based on the refined electrical maximum demand of 378 Amps (262 kVA), the NSW Health Infrastructure preferred and endorsed supply option is Option 1.

DEP Consulting have been engaged to complete the L3 ASP design. The certified design is expected to be complete in December 2023.

7.4 Low Voltage (400V) Main Switchboards

7.4.1 New "Site" Main Switchboard

Upgrading the existing fuses within existing kiosk substation S.35340 (Refer to Section 7.3.1 – Option 1) requires the installation of a new "site" main switchboard to enable separate supplies to be provided to:

- Existing Main Switchboard No. 1 – 800 Amp Supply (MDI reading from Ausgrid of 680 Amps – Refer to **Appendix A**)
- New Concord Forensic Mental Health Building Main Switchboard – 400 Amp Supply

The new "Site" MSB will be provided with a Service Protection Device to comply with the Service and Installation Rules of NSW.

7.4.2 New CFMH Main Switchboard

The CFMH building will be served by one (1) new dedicated Electrical Main Switchboard to be located within the main switchroom.

7.4.3 General

Main switchboards will have a minimum of Form 4a segregation as per AS 61439 with Non-Essential, Essential and/or Life Safety sections.

Main switchboards will be provided with surge protection.

Main switchboards will be provided with aminimum of 25% spare capacity on all busbar sections and chassis will be provided on each switchboard in accordance with the Engineering Services Guidelines.

Where Main Switchboards (MSB) have essential and life safety sections requiring generator backup, a Synchronised Closed Transition Transfer Switch (SCTTS) will be provided to allow automatic transfer of the power supply from normal to generator.

Main Switchboard(s) will have an allowance for a temporary (mobile) generator to be connected.

Refer to **Appendix F** for proposed location of new main switchroom.

7.5 Standby Power Generation

7.5.1 General

The existing 330kW/413kVA standby rated Kohler KV410 generator adjacent to Building 111 shall be replaced with a new 569kW/711kVA standby rated Himoinsa HSW-660 T5 generator in an acoustic weatherproof canopy and a fuel system including 3000L bulk fuel tank, fuel lines and valves.

The new generator shall be located where the existing 330kW/413kVA standby rated Kohler KV410 generator is located.

The “Site” Main Switch Board shall be provided with a Synchronised Closed Transition Transfer Switch.

The CFMH building does not have a Level 6 intensive care unit and therefore does not require standby power generators in N+1 plant configuration. Standby generators shall be provided in N plant configuration.

As per the NSW Health Engineering Services Guidelines, generator plant will be sized such that they are matched as closely as possible to the actual load.

The standby generator will be enclosed set type housed within an acoustic and weatherproof enclosure.

The acoustic pressure level of the enclosures shall be rated at 82dB(A) at 7 meters.

The new standby generator will have the capacity to provide 100% generator backup to the CFMH building to allow the backup of air conditioning within the patient/consumer areas as requested by the LHD. This is in addition to the ESG principles described in this section.

The NSW Health Engineering Services Guidelines requires that generators can provide 24 hours of standby power at full load. A double skinned base skid tank with a minimum of 3000L of storage capacity shall be provided to comply with the ESGs.

Refer to **Appendix F** for proposed location of new standby generator.

The new CFMH building will be provided with a quick connection facility (i.e., ‘power lock’ connection or busbar cable connection facility) for linking the loads identified under standby power to a temporary (mobile) generator set.

Generator load allocation will generally be based on NSW Health Engineering Service Guidelines and AS 3009, with a high-level summary as follows:

AS/NZS 3009-1998

AS/NZS 3009 Table 2.1 identifies the extent and classification (delay) of emergency (essential) supplies for several types of systems and areas. The extent of emergency supplies identified herein comply with the minimum requirements identified in AS/NZS 3009.

NSW Health Infrastructure Engineering Services Guidelines August-2022

The Engineering Services Guidelines 2022 requires standby power to be connected to all critical patient equipment required for critical procedures to allow completion should there be an outage.

Standby electrical power shall be provided to all subsidiary mechanical, hydraulic and medical gas systems (which are dependent on an electrical power source to operate) and are essential in delivering services to the critical care areas.

Standby sub-mains to be provided with standby generator supply are to be separate from the normal supply sub-mains.

The capacity of the standby generating plant is to be sized to match the diversified maximum demand adjusted to the standby coverage agreed for the project. In determining the coverage of standby power provision, the following principles apply:

- All life and safety requirements as required by the NCC
- All active equipment within ICT communication rooms
- Pneumatic tube, medical air, and suction equipment
- Renal dialysis equipment
- A minimum of 30% of lighting and power in all areas. This can vary depending on the number of light fittings and power outlets used in a particular room
- 100% lighting and power in critical areas, which include ED, operating theatres, sterile stock rooms, recovery units, coronary care units (CCU), ICU, neonatal intensive care units (NICU), cardiac catheterisation laboratories, burns units, mortuaries, and the renal dialysis units. This will include all air handling and exhaust fans serving these areas
- All air handling and exhaust fans serving isolation rooms, central sterile services department (CSSD) and pathology units
- Selected Imaging areas to support emergency departments
- Critical storage such as -80ºC fridges and blood fridges
- Sewage pumping stations if these were used
- Domestic water pumps if these were used

Spare capacity should only be provided from the difference between the actual “next size” rating of the generator and the calculated standby requirement. This means:

- Generators should be rated for standby duty
- Generators should be able to meet the power load on start up without stalling
- Large medical equipment loads will need to be considered
- Motor loads should incorporate delay start up where necessary to diversify the start-up currents over time in lieu of a peak current condition to allow the set to reach satisfactory operating conditions without stalling

7.6 Active Harmonic Filter/Power Factor Correction Unit

A new AHF/PFC unit will be provided for the new Main Switchboard within the new CFMH building’s Main Switchroom.

7.7 Uninterruptible Power Supplies (UPS)

The NSW Health Engineering Services Guidelines requires uninterruptible power for specific critical loads including, but not limited to:

- ICT / Communications Services
- Clinical / Medical Services
- Atrium Lighting

Security systems will be provided with their own battery system which provides 2hrs of backup to the controllers, each security controller panel will be plugged into an UPS socket-outlet.

In selected areas, critical computer and communication systems and those systems supporting critical and major medical equipment will need to keep on operating without interruption in the event of a power outage.

These selected areas include, but are not limited to:

- Staff Bases including e-MR downtime computer and printer
- Clinical Work Rooms
- Building Distributor Rooms

- Floor Distributor Rooms
- Lighting to public realm entries, atriums, and corridors (not applicable to the CFHM building)

The NSW Health Structured Cabling standard requires a redundancy of N+1 for ICT systems. This same level of redundancy will be provided to clinical UPS systems. This can be achieved via either of the two configurations below:

- two separate UPS systems, each loaded at 50%, but both capable of supplying 100% in the event of a single UPS system failure
- a modular UPS system with the load split between multiple smaller UPS modules specified to include N+1 redundant modules in a single or multiple cabinets.

UPS batteries are to be specified in multiple parallel strings such that a single string failure or planned maintenance does not affect the specified UPS system battery autonomy.

The new CFMH building will be served by a new dedicated centralised UPS and battery system housed within the Main Switch Room.

The new UPS system will be of N+1 type arrangement.

As there will be minimal clinical (medical power) UPS requirements it is proposed to provide a combined ce ICT and Medical power

As there will be minimal clinical (medical power) UPS requirements within the CFMH building, it is proposed to provide a single centralised UPS system for both ICT and Medical power (minimum battery autonomy of 15 minutes end of life).

The centralised UPS system (ICT & Medical) shall be sized using the following allowances as per the NSW Health ICT Cabling Standard:

- Building Distribution Room (BD) – 20kVA
- Floor Distribution Room (FD) – 9kVA
- Staff Station and Reception Desks – 1kVA

The proposed UPS solution for the new CFMH building is a modular system. This will allow maintenance and/or replacement of equipment to be undertaken via the lifts. The replacement of UPS equipment will not be required to be conducted using a crane.

Areas requiring UPS power outside the communication rooms will be provided with a UPS Distribution Board at the Electrical Distribution Board locations that will be fed from the centralised UPS system.

UPS Distribution Boards located within Communications Rooms will not provide UPS circuits to locations outside the Communication Rooms.

An allowance of two (2) UPS double power socket-outlets will be allowed for at each staff station for e-MR down-time PCs and printers.

The centralised UPS will not be sized to accommodate Major Medical Equipment (e.g., CT scanners, X-Rays, Fluoroscopes, etc). These devices will have UPSs supplied with them at purchase. Allowing for these devices within the Centralised UPS capacity is not cost effective as the UPS becomes unnecessarily large to be able to accommodate the high inrush currents of these devices.

7.8 Consumer Mains

New consumer mains will be provided to the new “Site” Main Switchboard from existing Ausgrid Substation S.35340 and the new standby generator.

The proposed location of the new “Site” Main Switchboard is adjacent to the new Fire Pump Room. Location to be finalised with Architect.

Consumer mains will be reticulated via conduit and enter the Main Switchboard from below.

Consumer’s mains will be rated to match the capacities of the transformer and generator.

7.9 Submains

Submains will be distributed via cable tray or conduits from:

- the main electrical switch room to the distribution boards

Cabling shall generally consist of XLPE/PVC multicore with different coloured outer sheaths to identify Essential and Uninterruptible Power Supply (UPS) submains.

Electrical cables will meet GBCAs Best Practice Guidelines for PVC in the Built Environment.

As per the NSW Health Engineering Services Guidelines, submains will be categorised into the following groups:

- Group A – Safety Services (AS3000 defined)
- Group B - Critical Care Services
- Group C - General Services

Submains will be rated based on the following criteria:

- Maximum demand
- 25% spare capacity

7.9.1 Group A – Safety Services

Submains for the emergency (fire/life safety) services will be fire-rated where required to comply with AS/NZS 3000.

Where fire rated cables are utilised, cables shall be installed on fire rated cable tray.

7.9.2 Group B – Critical Care Services

Standby lighting and power systems to AS/ NZS 3009 will be provided in critical care areas.

The NSW Health Engineering Services Guidelines defines critical care areas as areas where acute resuscitation procedures occur on a regular basis. These areas include:

- All clinical areas of the emergency department (ED).
- All clinical areas of the operating theatre suite
- Day procedures rooms
- Coronary Care Unit (CCU)
- Intensive Care Unit (ICU)
- Neonatal Intensive Care Unit (NICU)
- Renal dialysis units including the RO plant
- Angiography, cardiac catheterisation, and electrophysiology (EP) rooms
- Selected areas of the medical imaging unit

AS/ NZS 3009 requires that 100% of all power outlets in the ‘surgical suite’ (the operating room, anaesthetic preparation room, scrub and exit bay as a minimum) be connected to the emergency supply, or a UPS supply which is fed from the emergency supply.

Light and general-purpose power outlets in Group B critical care areas shall have dedicated sub-mains originating from the main switchboard, feeding dedicated distribution boards.

There will be a minimum of three dedicated sub-mains and distribution boards to Group B areas/ departments including:

- A non-essential sub-main and distribution board

- Essential sub-main and distribution board no. 1
- Essential sub-main and distribution board no. 2.

All patient bed locations and treatment spaces/ rooms shall be connected to both essential distribution boards and the load shall be split evenly across both supplies.

The non-essential distribution board shall be used for non-patient locations associated with cleaners GPO, a percentage of the office/ workstation GPO, utility rooms, storerooms etc.

In addition to the three separate sub-mains, an additional sub-main and distribution board may be required to specific spaces/ rooms for UPS supplies (e.g., the operating theatre suite, ICU, NICU and medical imaging department).

These group B sub-mains shall be a direct feed from the building's main LV switchboard.

Critical care sub-mains cables are not required to be fire rated, however protection against mechanical damage will be provided.

Based on the above, there are no critical care services within the CFMH building.

7.9.3 Group C – General Services

The remaining submains for non-critical services and equipment will be wired in accordance with AS3000 and will comprise the following:

- General light and power throughout the buildings
- General lighting and power in all the inpatient units that are not covered under the Group B cable reticulation requirements
- Mechanical services systems
- Medical imaging systems
- Computer (IT servers) systems and
- Hydraulic services systems

There will be a minimum of three sub-mains and distribution boards to the above areas/departments including:

- A non-essential sub-main and distribution board
- Essential sub-main and distribution board no 1
- Essential sub-main and distribution board no 2.

All patient bed locations and treatment spaces/ rooms shall be connected to both essential distribution boards and the load shall be split evenly across both supplies.

A value engineering option to only provide one essential circuit per patient bed location (including adjacent ensuite) has been proposed. Refer to Section 9.

The non-essential distribution board shall be used for non-patient locations associated with cleaners GPOs, a percentage of the office/ workstation GPOs, utility rooms, storerooms etc.

These Group C sub-mains do not need to be fed directly from the main switchboard but can be connected to a rising main system with tap off units at each floor.

Group C sub-mains cables are not required to be fire rated, however protection against mechanical damage shall be provided.

7.10 Distribution Boards

The CFMH building will be served by new dedicated electrical Distribution Boards on each level.

Distribution boards shall be minimum Form 2bi, with Form 4aih NHP Grizzbar, Schneider Isobar chassis or approved equivalent.

A minimum of 25% spare capacity on all busbar sections and chassis shall be provided on each switchboard in accordance with the Engineering Services Guidelines.

Switchboard enclosures shall be minimum IP43.

New cupboards which house Distribution boards shall be illuminated by luminaires connected to the Essential services supply.

As per the NSW Health Engineering Services Guidelines, at least one distribution board will be provided for each fire compartment, except for where fire compartments are less than 300m^2.

Distribution boards will be fitted with circuit breakers and RCDs where required for all final sub-circuits.

As per the NSW Health Engineering Services Guidelines, all areas shall be provided with a minimum of three dedicated sub-mains and distribution boards including:

- A non-essential sub-main and distribution board
- Essential sub-main and distribution board no. 1
- Essential sub-main and distribution board no. 2.

A value engineering option to only provide two EDB cupboards on Ground Floor and two EDB cupboards on Level 1 and only two distribution boards within each cupboard has been proposed. Refer to Section 9.

In addition to the three separate sub-mains, an additional sub-main and distribution board may be required to specific spaces/ rooms for UPS supplies (e.g., the operating theatre suite, ICU, NICU and medical imaging department).

Surge protection shall be provided at each new distribution board.

7.11 Voltage Drop

As per the requirements of AS/NZS 3009, the fall in voltage from the output terminals of the emergency lighting and power supply to any point in the installation shall not exceed 5% when the total load served by the power source is connected.

The 5% limit prescribed in AS/NZS 3009 takes account of the fact that the voltage at the emergency power source may be as low as 85% of the nominal value.

Generally, the voltage drop throughout the system will be divided as follows:

- Consumer mains ≤ 0.5%
- Submains ≤ 2%
- Final Circuits ≤ 2.5%

7.12 Metering, Energy Monitoring and Power Management

Within the CFMH, facilities for energy monitoring will be provided in accordance with the requirements of the Supply Authority and the NCC 2019 Part J8.3.

Energy meters will be configured to enable recording of real-time power and energy data. At a minimum, energy meters will be provided to enable metering of the following:

- air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and
- artificial lighting; and
- appliance power; and
- central hot water supply; and
- internal transport devices including lifts, escalators, moving walkways, etc; and
- other ancillary plant.

Energy meters will be interlinked by a modbus communications system or equivalent.

Energy meters will be interlinked via the building management and control system (BMCS).

7.13 Cable Enclosures & Materials

Cable enclosures and materials will be provided throughout to facilitate the installation of cabling throughout the facility. Cable enclosures will include, but not be limited to the following:

- Fire rated ladder, conduits, and enclosures for HV cables
- Fire rated ladder and tray for safety services
- Ladder for submains
- Basket, conduits, cable ducts, skirting ducts and catenary wiring for final circuits
- Basket, conduits, cable ducts, skirting ducts and catenary wiring for Communication Cables
- Yellow fibre raceways within building distributors

Generally, all cable enclosures and materials will be concealed within the fabric of the building, risers, and plant areas.

7.14 Cardiac and Body Protected Areas

Electrical services within body protected and cardiac areas shall comply with AS/NZS 3003. Generally, Leakage Protection Devices (LPDs) will consist of 10mA residual current devices.

For UPS circuits required within procedure areas (e.g., Procedure Rooms), isolation transformers and line isolation and overload monitors will be provided as per the NSW Health Engineering Services Guidelines.

Locations requiring cardiac or body protection have been based on the AHFGs.

7.15 Mental Health Patient/Consumer Areas

7.15.1 General

Fixtures and fittings should meet the required function, be safe, durable, tamper-proof and concealed where possible. Ensuring they are flush with the surfaces to which they are attached or are designed in a way that prevents attachment of anything around them (e.g., cords or belts). It is critical to ensure that if anything is or can be attached to the fitting or fixture it will break away when a weight of 15kgs is applied.

Fixtures and fittings should be kept to a minimum and be non-breakable. They should also:

- have no ligature points;
- provide no access to electrical wires;
- where needed, include shatterproof glass which cannot be removed or damaged by the consumer; and
- secure all ceiling-mounted fittings and fixtures

Fixtures and fittings include, but are not limited to, the following:

- power socket-outlets
- switches
- data outlets
- card readers
- request-to-exit buttons
- emergency door release buttons (i.e., break glass units)
- intercoms
- lights including exit signs and emergency lights
- nurse call buttons

There are specialised anti-ligature and anti-tamper electrical, data and security fixtures that need to be installed in a mental health facility:

- Anti-ligature / anti-tamper retaining screws.
- Robust, tamper-resistant light fittings inclusive of emergency lighting shall be used in consumer areas.
- Equipment located in ceiling cavities should be secured above patient areas.
- Cabling installed in ceiling cavities should be secured above patient/consumer areas.

7.15.2 Electrical (Power)

AS3003 requires areas intended for the care of patients who are susceptible to self-harm (intentional or unintentional) to be wired as body-protected areas, except that RCDs shall be located in an area readily accessible only to staff (e.g., the staff station).

All readily accessible low voltage socket-outlets located in areas accessible to mental health (or other self-harm) patients shall:

- Be secured using tamper-resistant screws.
- Incorporate safety shutters, which shut off the live pin holes until the earth pin is inserted.
- Not include indicator lights.

Cabling installed near building surfaces (e.g., walls) and not protected by an RCD shall be provided with adequate mechanical protection. (e.g., within conduit)

7.15.3 Lighting

Light fittings should be robust (i.e., non-breakable), tamper-resistant (i.e., secured using tamper-resistant screws) and incapable of supporting a consumer's weight.

Consideration should be given to the acuity level of the patient cohort and whether less robust light fixtures that are able to create a more comfortable, varied, inviting and interesting atmosphere whilst supporting the intention of the architectural design and the functional requirements of the health facility are acceptable to the expert clinical group.

Adjustable or dimmable lighting should be provided, rather than ON/OFF lighting.

Dimmer controls (e.g., rotary dimmers) are not recommended to be provided where patients/consumers are unobserved (e.g., within patient/consumer bedrooms and ensuites).

In patient/consumer bedrooms, lights should be controllable in groups to allow the consumer to adjust the level of lighting in their room to their preference.

Lighting selections should be low glare.

Where consumers are confined to bed, lighting should be arranged to limit the discomfort glare to the consumer.

7.15.4 Data and Communications

Where possible, intercom stations should be installed flush to the building surface.

In mental health inpatient units, Wireless Access Points (WAPs) and/or BLE beacons will be installed and securely fixed within ceiling cavities. Where this cannot be achieved, WAP enclosures to be provisioned for all internal and external consumer areas.

A mental health facility will have very different wall characteristics and Wireless Access Point (WAP) location requirements compared to a regular ward.

The need to ensure WAPs are not readily accessible, and cannot be used as a ligature point, should be included in the determination of the AP type for Mental Health Unit predictive Wi-Fi surveys.

An accurate wireless survey will be conducted to determine the exact access location and coverage for an RTLS implementation.

Once the site has reached completion, user acceptance testing (UAT), using actual devices (i.e., personal duress tags) must be undertaken to ensure that the actual experience matches the designed experience. If issues are discovered, then rectification works will be required to fix the problem to ensure the actual RF coverage aligns to the zone requirements set for the facility.

There should be 5m of excess cable for each Wireless Access Point (WAP) data outlet provided to allow the Access Points to be relocated.

Consideration should be given to In Building Coverage (IBC) for mobile wireless devices (MWD). Mobile wireless devices are defined as:

- Site specific two-way radio devices – two-way radios used by Security and/or Mental Health Staff;
- Mobile and smart phones;
- Laptop computers and wireless equipped tablets;
- Personal digital assistants;
- Public Safety Network (PSN) devices – two-way radios used by NSW Police Service, NSW Ambulance Service, NSW Fire Brigade, Department of Corrective Services, and other NSW Government Department radio networks;
- Health Interior Radio Paging Network (HIRPN) - all pagers on the HIRPN which have coverage throughout the Greater Sydney Metropolitan area including the Blue Mountains & Gosford; and
- Any other devices using commercial carrier provided access, including security and biomedical devices using Subscriber Identity Modules (SIM cards).

7.15.5 Security and Access

Where possible, the use of EMLs within patient/consumer areas should be avoided. This is due to the fail-safe (unlocked) nature of electromagnetic locks in the event of a power failure.

Where electromagnetic locks are installed on leaf (swing) doors, the electromagnetic lock magnet shall have a holding force up to 580kg (for a single magnetic lock).

Where electromagnetic locks are installed on sliding doors, the locks shall consist of internal recessed locks.

Securely fasten the EML to the head or top frame of the door. If the frame is not structurally strong enough to prevent lock movement, the frame shall be strengthened, or the lock shall be mounted in such a manner to ensure it is securely fastened.

All doors fitted with EMLs shall also have a separate reed switch installed on the door to provide door position status.

CCTV

CCTV monitors are required in each staff station / clinical workroom for observation purposes only. (i.e., allow staff to view the overt camera surveillance footage).

General mental health staff shall not have the capability to view stored camera surveillance footage.

Only personnel with appropriate security permissions shall be allowed to view/access stored camera surveillance footage.

7.15.6 Emergency and Communications Systems (Duress or Nurse Call)

Emergency and communication systems should be installed in a way that does not generate disturbing noises. Alternatives are linking these systems to phones or pagers or utilising other alert systems such as lights.

Patient emergency buzzers are not to be used in lieu of fixed or personal duress alarms.

Mobile (Personal) Duress Alarms

A system of personal or mobile duress alarms with location finders should operate throughout the unit and in all outdoor areas accessed by consumers.

The mobile duress system operates using Wi-Fi based Real-Time Locating Systems (RTLS) solutions. The mobile duress system may also incorporate Bluetooth Low Energy (BLE) beacons.

In mental health inpatient units, Wireless Access Points (WAPs) and/or BLE beacons will be installed and securely fixed within ceiling cavities.

The Wi-Fi infrastructure shall be designed in accordance with relevant NSW Health standards (i.e., NSW Health Campus LAN Wired and Wi-Fi Standard).

Fixed (Hard-wired) Duress Alarms

A fixed (hard-wired) duress system shall be provided as a backup to the mobile duress system.

Fixed duress buttons should be located in areas where staff work in a relatively fixed position (e.g., receptions, staff stations, consult rooms and tribunal meeting rooms).

Fixed duress button locations must not be susceptible to tampering or activation by patients or visitors.

Location of fixed duress call points is critical to ensure that:

- staff can activate an alarm discreetly;
- they cannot be activated by consumers or children; and
- they cannot be activated accidentally (e.g. by a chair being pushed back)

Review of operational requirements on whether a Master cancel button for Fixed duress at the staff station is required.

Assistance (Nurse) Call Systems

A consumer to nurse call button will be located in accessible bedrooms and ensuites.

A consumer to nurse call buttons will be considered for inclusion in all other bedrooms. The rationale for inclusion is to manage the elderly, unwell consumers, and those requiring isolation (e.g., during a pandemic)

Presence sensors shall be provided in line with the model of care.

Presence sensors shall be secured using anti-tamper screws.

7.15.7 Audio Visual Systems

Interview Rooms and Tribunal Rooms are to be provided with video-conferencing capabilities to allow for a medical practitioner or accredited person to examine a person using an audio-visual link in accordance with the Mental health Act 2007 S27A(ii) and eHealth NSW standards.

To comply with the BCA/NCC, hearing augmentation is often required to be provided in rooms with audio-visual systems (e.g., ceiling speakers, sound bars). Careful consideration should be given to the type of hearing augmentation (e.g., RF transmitter, hearing loops) to be provided within these spaces.

Where the consumer environment requires audio services, careful consideration should be given to how this is provided. Previous installations have had connectivity issues when connections are done via Bluetooth or Wi-Fi.

7.16 Power socket-outlets

As per the requirements of the AHFGs and Project User Groups, power socket-outlets will be provided throughout the health facility to the following area categories:

Power socket-outlets will be colour-coded as follows:

- Socket-outlets connected to a normal supply shall be colour-coded white.
- Socket-outlets connected to an essential supply shall be colour-coded red.
- Socket-outlets connected to an uninterruptible supply shall be colour-coded dark blue.
- Socket-outlets identified ‘CLEANING PURPOSES ONLY’ shall be colour-coded beige.

Final sub-circuits will be protected by RCDs/LPDs in accordance with AS3000 and AS3003 as required.

For mental health areas, the NSW ESG requires that all socket-outlets installed within mental health patient/consumer areas are tamper proof.

It should be confirmed with the LHD whether socket-outlets within the patient/consumer areas are required to be colour coded. The colour coding requirements of As3003 need not apply to areas intended for the care of patients who are susceptible to self-harm (intentional or unintentional).

7.16.1 Cleaner's outlets

For body-protected electrical areas, cleaner's outlets shall be positioned within 15m of any part of the patient area(s).

For cardiac-protected electrical areas, at least one cleaner's outlet shall be provided within the patient area.

7.17 Medical Services Panels

Locations shall be based on the AHFGs and confirmed with the Project User Groups during the Design Development stage.

Medical Services Panels shall be finished with an anti-microbial coating system.

Medical Services Panels will be complete and provided with all required outlets and accessories.

7.18 Exit and Emergency Lighting

A new computer monitored emergency lighting system will be provided to the new CFMH building to comply with AS/NZS 2293.1 and the NCC.

In addition to the requirements of AS2293 and the NCC, additional emergency lighting will be provided in the following areas:

- Patient treatment areas
- Stairs/Toilets/Change rooms
- Rooms greater than 120m^2 that are accessible to patients
- Staff areas where public address announcements are made
- Nurse stations
- Near manual Call Points
- Plantrooms

For mental health areas, the NSW ESG requires that all emergency lights and exit signs within patient/consumer areas are tamper proof.

7.19 Internal Lighting

The new building will be provided with new energy efficient LED luminaires.

Luminaire types will generally be as follows:

AREA DESCRIPTION	LUMINAIRE TYPE
Patient Areas (e.g., bedrooms, consult, etc)	Recessed LED luminaires with diffusing lenses, CRI > 90, cyanosis compliant, minimum IP44 from below, sealed anti-ligature and tamper proof luminaires
Non-Patient Areas (e.g., offices, meeting rooms, stores, etc)	Recessed or surface mounted LED luminaires, CRI > 90
Bathrooms / Toilets	Recessed luminaires with diffusing lenses, sealed anti-ligature and tamper proof luminaires
Circulation Areas	Recessed luminaires with diffusing lenses
Isolation / Seclusion Rooms	Sealed anti-ligature and tamper proof luminaires
Mental Health rooms	Sealed anti-ligature and tamper proof luminaires
Plant Areas	Surface or suspended IP65 luminaires with polycarbonate diffusers
External Areas	IP rated luminaires to suit the application

Lighting of a specialist nature (e.g., bedhead lights, examination lights, procedure lights, operating lights) will be provided where required.

As per the Engineering Services Guidelines, luminaires for medical areas shall have a Correlated Colour Temperature of 4000K.

All ballasts will be DALI-dimmable electronic and controllable via a lighting control system compatible with AS/NZS 62386.104.

All patient areas shall utilise luminaires suitable for cyanosis observation in accordance with AS/NZS 1680.2.5.

All luminaires shall have a minimum Colour Rendering Index (CRI) of 90 (except for night lights) and utilise LED light sources. Luminaires shall have test certificates to prove compliance with the standards.

For mental health areas, the NSW ESG requires that all luminaires and light switches within patient/consumer areas are tamper proof.

As per the requirements of the ESG, atrium lighting shall be provided with a UPS power supply.

The lighting within the new CFMH shall be designed to, but not limited to, the following AS1680 recommended minimum illuminance levels:

TYPE OF INTERIOR OR ACTIVITY		MAINTAINED ILLUMINANCE LX
1.	**ENTRANCES**	
1.1.	Entrance halls, lobbies, foyers	160
1.2.	Waiting rooms	160
1.3.	Enquiry desks/reception	320
2.	**CIRCULATION AREAS**	
2.1.	Corridors, passageways, ramps	40
2.2.	Stairs (internal)	80
3.	**STAFF ROOMS**	
3.1.	Changing rooms, locker rooms	80
4.	**STOREROOMS**	160
5.	**PLANT ROOMS**	
5.1.	General	80
5.2.	Control panels, switchboards	160
6.	**OFFICES**	320
7.	**PATIENT AREAS**	
7.1.	Wards – General	
a)	General lighting	160
b)	At bedhead (reading)	240
c)	Examination lighting	320

d)	Night lighting	1
7.2.	Patients' lounges	
7.3.	Wards – Infants	160
a)	General lighting	240
b)	Night lighting	10
7.4.	Wards – Intensive care, etc	
a)	General lighting	160
b)	Examination lighting	400
c)	Night watch lighting	10
8.	**PATIENT TRANSIT AREAS**	
8.1.	General	160
8.2.	Emergency department to operating rooms	240
9.	**PATIENT BATHROOMS, TOILETS AND SHOWERS**	160 (200 for accessible toilets)
10.	**TREATMENT AREAS**	
10.1.	General area types	
a)	Type A areas – applies where anaesthesia or intravenous sedation is required as part of the procedure	400
b)	Type B areas – applies where observation of patient skin colour is important but anaesthesia or intravenous sedation is not required	320
c)	Type C areas – applies to general examination and treatment rooms	320
11.	**SUPPORT AREAS**	
11.1.	Nurses' station	
a)	General/desk at night	240
b)	Desk by day	320
11.2.	Dirty utility room	160
11.3.	Clean utility room	240
11.4.	Laboratories and dispensaries	400
11.5.	Doctors'/Nurses' duty room	240

Table 1 - reproduced from AS1680.2.5

7.19.1 Procedure and Examination Lighting

Procedure and examination lighting including supports will be provided as required.

All procedure and examination lighting will be supplied via an essential supply.

7.20 External Lighting

7.20.1 General

As per the requirements of the NSW Health Protecting People and Property document, lights used for security purposes must be connected to back up power where practicable (including external lighting) e.g., generator or uninterrupted power supply (UPS).

External lighting will be supplied from an Essential (generator backed) power supply.

The following is an overview of the lighting design methodology applied to external building surrounds, access roads and pedestrian pathways on the site.

The following issues shall be considered and addressed in this report:

- Energy efficient lighting
- Creation of a safe well-lit environment
- Limiting spill light to adjacent residential land (Refer to Section 7.20.8)
- Aesthetically suitable lighting arrangement
- Lighting control systems
- Maintenance and ongoing running costs

7.20.2 Design Criteria for External Lighting

The exterior lighting will comply with the following standards and guidelines:

- AS 4282 - Control of obtrusive effects of outdoor lighting
- AS/NZS 1158.3.1 - Pedestrian area lighting (category P)
- AS 3000 - SAA wiring rules

7.20.3 External Building Surrounds

Lighting to external building surrounds will be provided to integrate with the architectural design and the overall aesthetics of the building. Vandal and weather resistant LED light fittings will be provided in external areas as appropriate.

Lighting to external building surrounds will be provided to achieve lighting subcategories:

- PR2 for access roads (refer to Section 7.20.4); and
- PP2 for pedestrian pathways (refer to Section 7.20.5).

Lighting to external building surrounds will also be provided for security purposes. Lighting levels associated with lighting category PP2 will be enough to enable operation of surveillance cameras (typically 0.3 - 0.6 lux).

Lighting category PP2 is determined based on the following selection criteria:

- Pedestrian/cycle activity – High
- Fear of crime – Medium

The light technical parameters associated with Category PP2 lighting are as follows:

- Average horizontal Illuminance – 7 lux
- Point horizontal illuminance – 1 lux
- Illuminance (horizontal) uniformity – 5
- Point vertical Illuminance – 0.3 lux

7.20.4 Access Roads

Access road lighting will be designed to comply with both AS/NZS 1158.3.1 – Pedestrian area lighting (category P), and AS/NZ 4282 – Control of the obtrusive effects of outdoor lighting.

Lighting to access roads will be designed to lighting subcategory PP2.

Lighting category PR2 is determined based on the following selection criteria:

- Pedestrian/cycle activity – High
- Fear of crime – Medium
- Need to enhance amenity - High

The light technical parameters associated with Category PR2 lighting are as follows:

- Average horizontal Illuminance – 3.5 lux
- Point horizontal illuminance – 0.7 lux
- Illuminance (horizontal) uniformity – 8

Where required, it is proposed to utilise pole mounted LED light fittings with Type 2M/3M optics.

Light fittings will have zero-degree horizontal cut off to minimise any upward light spill.

Where necessary, light fittings will be provided with shields to prevent light spill into adjoining properties and sensitive receivers as identified in Section 7.20.8.

Surface-mounted LED light fittings will be fixed to the building where appropriate to the architectural intent.

7.20.5 Pedestrian Pathway Lighting

Pedestrian pathway lighting will be designed to comply with both AS/NZS 1158.3.1 – Pedestrian area lighting (category P), and AS/NZ 4282 – Control of the obtrusive effects of outdoor lighting.

Lighting to new pedestrian pathways will be designed to lighting subcategory PP2.

Lighting category PP2 is determined based on the following selection criteria:

- Pedestrian/cycle activity – High
- Fear of crime – Medium

The light technical parameters associated with Category PP2 lighting are as follows:

- Average horizontal Illuminance – 7 lux
- Point horizontal illuminance – 1 lux
- Illuminance (horizontal) uniformity – 5
- Point vertical Illuminance – 0.3 lux

It is proposed to utilise pole mounted LED light fittings with Type 2M/3M/Type 4M/Type 5M (Symmetrical) optics.

Light fittings will have zero-degree horizontal cut off to minimise any upward light spill.

Where necessary, light fittings will be provided with shields to prevent light spill into adjoining properties and sensitive receivers as identified in Section 7.20.8.

Surface-mounted LED light fittings will be fixed to the building where appropriate to the architectural intent.

7.20.6 External Car Parks

Where modifications are required to the existing P14 carpark, new lighting will be designed in accordance with this section.

External car park lighting will be designed to comply with both AS/NZS 1158.3.1 – Pedestrian area lighting (category P), and AS/NZ 4282 – Control of the obtrusive effects of outdoor lighting.

Lighting to new external car park areas will be designed to lighting subcategory PC1.

Lighting to designated parking spaces specifically intended for people with disabilities will be designed to lighting subcategory PCD.

Lighting to any designated areas for pedestrians to cross will be designed to lighting subcategory PCX.

Lighting subcategory PC1 is determined based on the following selection criteria:

- Night-time vehicle and/or pedestrian movements – High
- Fear of crime – High

The light technical parameters associated with Category PC1 lighting are as follows:

- Average horizontal Illuminance – 14 lux
- Point horizontal illuminance – 3 lux
- Illuminance (horizontal) uniformity – 8
- Point vertical Illuminance – 3 lux

The light technical parameters associated with Category PCD lighting are as follows:

- Point horizontal illuminance – greater than 14 lux and greater than the average for the overall car park

The light technical parameters associated with Category PCX lighting are as follows:

- Average horizontal Illuminance – 21 lux
- Point horizontal illuminance – 5 lux
- Illuminance (horizontal) uniformity – 8

It is proposed to utilise pole mounted LED light fittings with Type 3M/Type 4M/Type 5M (Symmetrical) optics.

Light fittings will have zero-degree horizontal cut off to minimise any upward light spill.

Where necessary, light fittings will be provided with shields to prevent light spill into adjoining properties and sensitive receivers as identified in Section 7.20.8.

7.20.7 Landscape Lighting

Landscape lighting will be designed to comply with both AS/NZS 1158.3.1 – Pedestrian area lighting (category P), and AS/NZ 4282 – Control of the obtrusive effects of outdoor lighting.

Landscape lighting will be provided in consultation with the Architects and Landscape consultants. In addition to functional lighting, ambient lighting will be provided to illuminated landscape features and plants.

7.20.8 Light Spill Minimisation

All new external lighting will comply with AS 4282 – Control of the obtrusive effects of outdoor lighting.

External lighting will be designed with due consideration of lighting spillage to adjacent properties and sensitive receivers.

The following approaches will be incorporated into the external lighting design to minimise obtrusive lighting:

- Luminaire mounting heights selected to minimise spillage and cater for better lighting control
- Where possible, light fittings adequately setback from the property boundary to reduce light spill
- Light fittings with narrow beam or sharp cut of angles
- Light fittings with low vertical aiming angles
- Where necessary, light fittings will be provided with shields to prevent light spill

7.20.9 External Lighting Control

External lighting will be controlled by a combination of photo electric (PE) cells and time clocks as part of the lighting control system

This will allow some lights to remain on from dusk to dawn and others to switch off at a pre-set time at night

Final operating conditions will be coordinated with the Hospital during construction and commissioning.

7.20.10 Maintenance

Energy efficient lamps, control gear and luminaires will be selected. Vandal resistant luminaires and associated supporting facilities will be selected and ease of maintenance will be considered in the selection and design.

7.21 Lightning Protection

The new CFMH building will be provided with a lightning protection system. A conventional solution in accordance with AS1768 shall be installed; no other solution shall be allowed. The lighting protection system shall have a minimum lightning protection level of IV. Refer to **Appendix G** for Lightning Risk Assessment completed in accordance with AS 1768-2021.

The lightning protection system shall consist of metal air terminals at the high parts of the building connected to the structural steel framing of the building, which will be earthed in the vicinity of the foundation. Test points shall be provided on ground level to allow regular testing of the system to be undertaken.

7.22 ICT Infrastructure

7.22.1 General

The redundant backbone cabling system topology recommended in the NSW Health ICT Cabling Standard V3.0 and indicated below will be implemented within the CFMH building.

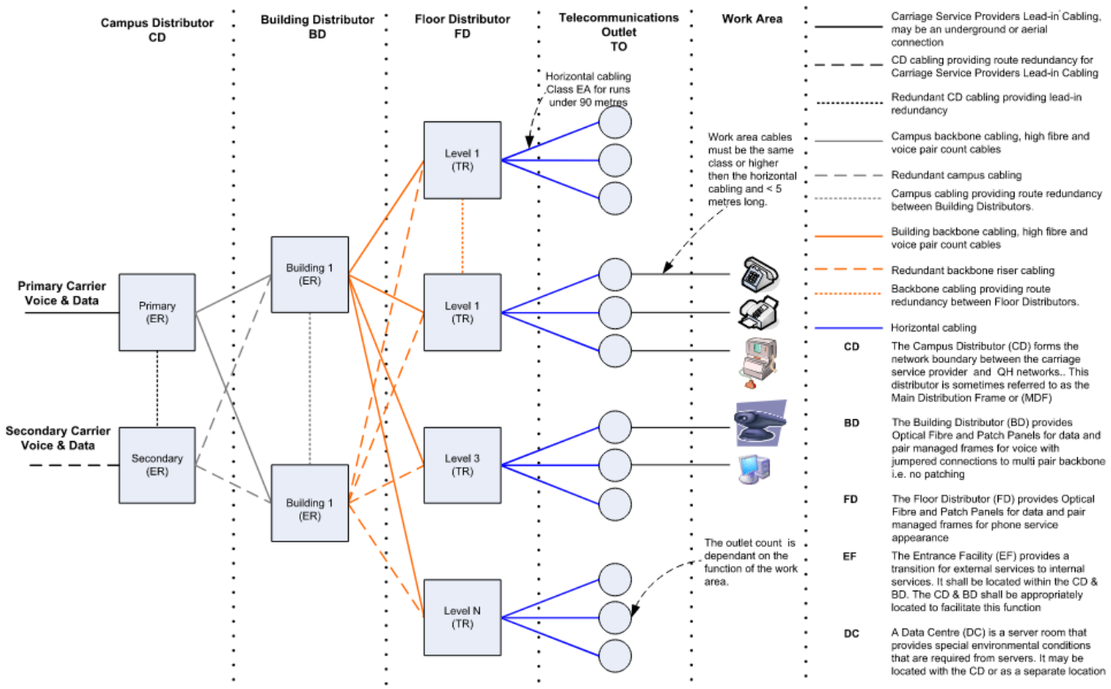


Figure 3 – NSW Health ICT Cabling Standard Cabling Architecture

It is proposed to establish one (1) new Building Distributor (BD) room within the new CFMH building. The new Building Distributor room will be connected to the existing Campus Distributors within Building 5 and 58 and the existing PABX within Building 4.

7.22.2 Structured Communications Cabling Installation

General

The CFMH Redevelopment shall be provided with:

- one (1) new Building/Floor Distributor room on Ground Level,
- one (1) new Floor Distributor room on Level 1. and
- one (1) new Floor Distributor room on Level 2

Telecommunications field outlet cabling throughout the building will originate from these rooms.

The telecommunications rooms will be designed in accordance with the NSW Health ICT Rooms Standard.

The new Building/Floor Distributor room in the CFMH building shall be connected to the existing Campus Distributors within Building 5 and 58 and the existing PABX within Building 4. **Confirmation from SLHD ICT of where the fibre and copper backbone cabling connects back to is required.**

Electrical, plumbing, mechanical or other services (not specifically required for the ICT equipment or cabling) shall not enter or pass through the Communications Rooms.

The Structured Cabling Systems will be in accordance with the NSW Health ICT Cabling Standards.

Voice and Low Speed Data (Copper) Backbone Cabling

Generally, a 25 pair CAT 3 copper cable (for PSTN phones) will be provided between the new Building Distributor(s) and the Floor Distributor(s).

Fibre Optic Backbone Cabling

Fibre optic backbone cabling will be Optical Single Mode 2 (OS2) cable with all cores terminated in Fibre Optic Break Out Trays (FOBOTs) at either end and terminated or splices to LC connectors in accordance with the NSW Health ICT Cabling Standard.

For Floor Distributors servicing less than one thousand (1000) metres^2 of usable floor space, fibre optic backbone cabling will have a minimum of 12 cores.

For Floor Distributors servicing more than one thousand (1000) metres^2 of usable floor space, fibre optic backbone cabling will have a minimum of 12 cores per one thousand (1000) metres^2 or part thereof.

Horizontal Cabling

All new horizontal cabling shall consist of S/FTP (screened) Category 6A / Class EA cable.

The route length of all horizontal cable runs from the communications rack patch panels to the telecommunications outlets shall not exceed 90m.

Horizontal cabling shall cross other runs of cables at ninety (90) degrees wherever possible. All pairs of all horizontal cabling shall be terminated at both ends and shall be installed to avoid stretching, kinking, tight bends and damage from adjacent fixtures or plant.

7.22.3 Telephony

Extension of the existing VoIP PABX system is to be employed within the new CFMH building. The works will include the upgrade, as required, of the VoIP server equipment, multiservice router and VoIP gateway licenses, handsets, and professional services, to support the additional ICT requirements for this building.

A small number of telephones capable of operating in the event of power failure to PoE switches will be provided.

7.22.4 Wi-Fi Network

The new CFMH building will be provided with internal Wi-Fi coverage throughout.

The need to ensure Wireless Access Points (WAPs) are not readily accessible and cannot be used as ligature points will be included in the determination of the type of WAPs to be used for the CFMH building. As per the AHFG Health Planning Unit 131 Mental Health – Overarching Guideline, they will be installed in ceiling cavities.

External Wi-Fi coverage will be provided to the following areas:

- Courtyards
- Docks and vehicle entry points
- Immediate surrounds of the building (10 metres from wall)

The system will support RTLS and Wi-Fi telephony services, including mobile duress.

WAPs shall be provided with dual RJ-45 data outlets in accordance with the NSW Health ICT Cabling Standard.

Wi-Fi predicative heat mapping, which will inform the locations of the Wireless Access Points (WAPs), is to be provided by LHD ICT.

In the absence of predictive heat maps, an allowance of one (1) WAP per 70m2 is to be made in accordance with the NSW ESG.

7.22.5 Voice over Wi-Fi (VoWi-Fi)

Where required new wireless telephones will have VoWi-Fi functionality. These devices will be able to operate using the building Wi-Fi network.

7.23 Assistance (Nurse) Call system

A new IP based Nurse Call system shall be installed within the CFMH building.

The new system will be required to be able to interconnect with the Campus Message Integration Engine that will allow Emergency Calls (i.e., Code Blue) to be sent to the appropriate personnel. Further integration with existing systems will not be required.

Locations and quantities of nurse call components shall be determined in accordance with the AusHFG guidelines (Room Data Sheets & Room Layout Sheets) and in consultation with the Project User Groups.

7.24 Patient Entertainment System

The new building will be provided with the infrastructure to allow the implementation of an IP based system solution.

7.25 Audio Visual Systems

As per the functional design brief, videoconferencing and teleconferencing will be provided to the following areas:

- mental health tribunal (MHRT)
- teaching including IT resource room and Library/Computer room
- meeting rooms

Audio-visual equipment shall align with NSW eHealth approved hardware list or approved equivalent.

Audio-visual equipment requirements to be confirmed during design finalisation and construction.

7.26 Hearing Augmentation Systems

Hearing augmentation systems shall be provided where an inbuilt amplification system is provided in accordance with the NCC.

Hearing augmentation will generally be provided by induction hearing loop systems.

Where induction hearing loops are provided, they will cover at least 80% of the floor area of the room or space that is served by the inbuilt amplification system.

Where it is determined that an alternate hearing augmentation system is more suitable, hearing augmentation may be provided by either:

- Frequency modulation (individual receivers worn by users to receive radio waves (i.e., a FM transmitter / receiver systems), or
- Infra-red (emitters / receivers' system, where individual receivers are worn by users to receive infra-red beam by a direct line of sight).

For hearing augmentation systems using audio receivers, such as Infra-Red (IR) or radio frequency FM transmitter / receiver systems, the system will cover at least 95% of the floor area of the room or space served by the inbuilt system, and a minimum number of receivers will be provided in a ratio depending on the number of people who may be accommodated in the room in accordance with the NCC.

Areas requiring hearing augmentation shall be confirmed during design finalisation and construction.

7.27 Public Address System (PA)

No public address is proposed for the CFMH building.

7.28 In Building Coverage (IBC)/ Distributed Antenna Systems (DAS)

A baseline network coverage assessment shall be completed prior to the start of any works to determine if a DAS or other alternative solution is required to improve the service of one or more Wireless Service Providers (WSPs).

A new DAS room has **NOT** been allowed for within the new CFMH building. A new DAS room will require new dedicated carrier cables to be brought into the building from the street.

Design Guidance Note No. 7 provides information concerning the challenges of providing In Building Coverage (IBC) for mobile wireless devices (MWD), for consideration during the development of hospital infrastructure.

Design Guidance Note No. 7 defines "mobile wireless devices" as:

- Mobile and smart phones.
- Laptop computers and wireless equipped tablets.
- Personal digital assistants.
- GRN devices – two-way radios used by NSW Police Service, NSW Ambulance Service, NSW Fire Brigade, Department of Corrective Services, and other NSW Government Department radio networks.
- Health Interior Radio Paging Network (HIRPN) - all pagers on the HIRPN which have coverage throughout the Greater Sydney Metropolitan area including the Blue Mountains & Gosford; and
- Any other devices using commercial carrier provided access, including security and biomedical devices using Subscriber Identity Modules (SIM cards).

If required, the Distributed Antenna Systems shall comply with the current Mobile Carrier Forum (MCF) DAS Design Specification.

Unless specifically agreed to by the Lead Carrier, the CFMH building will be provided with the following Distributed Antenna Systems

- an in-building distributed antenna systems (DAS) for mobile/cellular services (e.g., Telstra, Optus, Vodafone/TPG Telecom); and
- an in-building distributed antenna systems (DAS) for non-cellular services (e.g., Government Radio Network / Public Safety Network, land-mobile, paging, Wi-Fi)

As per the Mobile Carrier Forum (MCF) DAS Design Specification, non-cellular services such as land-mobile, paging and Wi-Fi must be deployed on separate infrastructure (i.e., separate DAS for cellular & non-cellular) unless specifically agreed by the Lead Carrier.

If agreed by the Lead Carrier, the non-cellular services must be properly integrated and incorporated from the initial design phase, rather than being subsequently added to the DAS.

The DAS designer shall measure the signals on the street for all Carriers and estimate building attenuation based on materials used in the building construction. Signal measurements should be collected for all Carriers on all bands.

As per Design Guidance Note No. 7, coverage surveys must be performed both pre- and post-installation and commissioning of the system. This is to be carried out by a recognised specialist designer and installer of RF installations.

The project is not responsible for providing infrastructure to address existing campus-wide network coverage issues.

DAS antennas within patient/consumer areas will be installed in a manner approved by the Project User Group (e.g., mental health approved recessed ceiling boxes, within ceiling cavity).

7.28.1 Target Coverage Areas

Cellular Services

The target coverage area of the cellular services DAS shall be 100% of the internal gross floor area. Design RF coverage contours to achieve the performance levels outlined in Mobile Carrier Forum (MCF) DAS Design Specification to the following areas unless agreed otherwise:

- All General Areas (consulting/treatment rooms, wards, walkways, waiting areas, entries etc.)
- Back-of-house areas (accessible to staff or authorised personnel)
- Building Core
- Inside Lift Cars (travelling non-stop the entire lift-run - best efforts required but does need to include RF design contours)
- Plant Rooms
- Fire Stairs (best effort)
- Public stairs

Government Radio Network (GRN)

In accordance with Design Guidance Note No. 7, the non-cellular services (GRN) DAS shall provide coverage to the following areas:

- Emergency Department
- Ambulance Bays
- Main Hospital Entrances

As there are none of the above areas within the CFMH building, GRN coverage is not required.

7.29 Radio Paging

The following is to be confirmed during design finalisation and construction.

The Concord Hospital campus is part of the Health Interior Radio Paging Network (HIRPN.

It will be necessary to extend the existing coverage of the existing POCSAG paging system employed at the Hospital into the new CFMH building.

The existing radio paging system will need to interface to any new systems in the CFMH that need to use the paging system to send messages. This is usually achieved using IP connectivity to the paging servers, with software integration managed between Ikonix Technology and the third-party vendor.

The pagers operate at 148.1375MHz, which is the frequency used by all hospitals on the HIRPN network.

The coverage is to be provided by a dedicated paging antenna system, separate from the mobile carrier, Wi-Fi, or GRN systems. This is due to the difference in broadcast frequency. The paging DAS will be designed to concentrate coverage to areas of high pager usage (e.g., ED or theatres), and less so in administrative or storage areas.

As part of the works, the following will be allowed for:

- a system coverage survey
- an additional antenna system, complete with direct CAT6A link to the paging equipment headend.

7.30 NSW Government Radio Network (GRN)

The Concord Hospital campus lies within the GRN coverage area.

As per the Engineering Services Guidelines, NSW GRN coverage is required to be provided within the following areas:

- Emergency Department
- Ambulance Bays
- Main Hospital Entrances

As there are none of the above areas within the CFMH building, GRN coverage is not required.

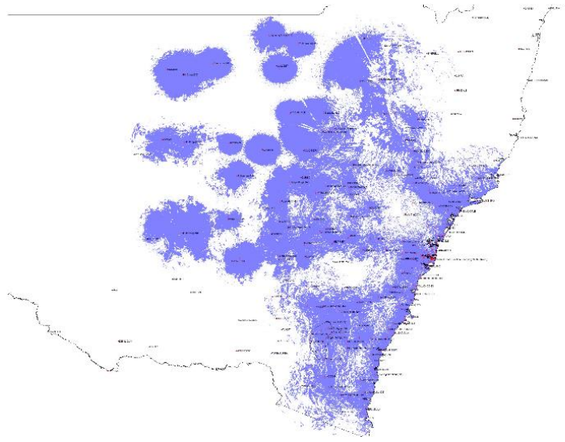


Figure 4 - GRN Network Map

7.31 Two-Way Radio System

The following is to be confirmed during design finalisation and construction.

The incumbent contractor will need to be engaged to conduct a coverage survey at the completion of construction. If coverage is not suitable, in-building DAS services will be provided to extend coverage.

The following extent of works has been assumed:

- Radio handsets will be transfer / group 3 items
- The CFMH will be provided with at least one additional antenna to boost the digital radio signal.
- Existing radio equipment will be retained in the existing hospital building.

7.32 CCTV

7.32.1 CCTV Digital Video Management Software (VMS)

The existing Milestone Digital Video Management Software (DVMS) shall be extended to the CFMH Redevelopment. The project will allow for any software upgrades to the latest milestone revision.

7.32.2 CCTV Storage Capacity

The *Protecting People and Property: NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies February 2022* states: “All camera surveillance that is recorded must be stored for a minimum of 21 days so that evidence is available following an incident“.

The existing storage will be expanded as required to provide a minimum of 21 days storage.

As the quantities and types of cameras informs the required Network Video Recorder capacities, final storage requirements shall be determined after consultation with the Local Health District is conducted and final quantities and types of cameras are confirmed.

7.32.3 CCTV Camera Locations

The *Protecting People and Property: NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies February 2022* states:

"NSW Health Agencies are required, in consultation with workers, other duty holders and security experts, to identify locations in buildings and grounds where overt camera surveillance may be of assistance, and clearly identify the purpose for each camera in relation to the security risk management program, i.e. is the purpose of the camera surveillance to provide a visual deterrent, to support access control measures or to be used to identify an incident where a duress response/code black response is required."

CCTV surveillance is proposed to the following locations:

- Entries and exits to the facility (including fire stairs, main entry, etc)
- Perimeter of the facility
- Inside lift cars
- Drug safes within patient/consumer areas
- Patient courtyards
- Secure entry
- Patient Property

The *Protecting People and Property: NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies February 2022* states:

"Where, following a security risk assessment, camera surveillance is required in a particular location, a risk assessment must also consider the effective placement of the camera within this location."

Locations of CCTV cameras to be confirmed during design finalisation and construction with the LHD and User Group.

7.32.4 CCTV Cameras

New IP based CCTV cameras will be provided to the CFMH building.

7.33 Access Control & Fixed Duress

The existing Integriti Access Control & Fixed Duress system utilised on the Concord Hospital campus shall be extended to the CFMH building.

7.33.1 Access Control Locking Types

The following is to be confirmed during design development.

Access controlled doors are proposed to be secured as follows:

DOOR TYPE	SECURITY MECHANISM
Single leaf door	Monitored Electric Strike (minimum ES9000)
Single leaf and a half door	Monitored Electric Strike, wired via concealed cable transfer in half leaf
Double doors (patient/consumer areas)	Monitored Electric Strike, wired via concealed cable transfer in one leaf
Double doors (non-patient/consumer areas)	Monitored Electromagnetic Lock (holding force = 550-580kg)

Reed sensors/switches will be provided to all door leaves.

Where required, auto-doors will be integrated with the access control system.

7.33.2 Access Control Monitoring/Alarms

Monitored electric strike and reed sensing will be utilised to provide warnings on Door Forced and Door Held conditions.

All access control doors will be fitted with Door Open Too Long (DOTL) local alarms as per the SLHD policy. In general areas this shall be via a pulsed beeper fitted to the ceiling or wall above the door. In patient areas, the warning device may be changed to a blue strobe lamp (this is to reduce the disturbance to patients during times of door unserviceability).

7.33.3 Access Control Locations

The following is to be confirmed during design finalisation and construction.

Access control will be provided in accordance with the AusHFG guidelines (Room Data Sheets & Room Layout Sheets) and in consultation with the Project User Groups.

Locations generally provided with access control (i.e., swipe card access) will be as below:

- Building Perimeter entry/exit doors
- Ward/Department perimeter entry/exit doors
- Perimeter doors to Staff Only corridors
- Staff Lifts

Door intercoms will be provided where required to suit the access control arrangement.

All access control doors will be fail-secure, unless on a fire-trip door.

All access control doors within the patient/consumer areas will be fail-secure. Doors secured via electromagnetic locks are to be provided with UPS supplies.

7.34 Intruder Alarms

As per the requirements of the Protecting People and Property NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies document, intruder alarms will be installed to pharmacies and drug safes. Intruder alarms will include detection of breaches to doors and windows including glass breakage detection.

The intruder alarm system shall be designed in accordance with AS/NZS 2201 and other relevant Australian Standards.

Where required, doors will be fitted with self-closing devices and reed switches to enable Door Open Too Long or Door-Forced Open conditions to be alarmed to security staff.

All drug safes will be fitted reed switches to enable Door Open Too Long or Door-Forced Open conditions to be alarmed to security staff.

All access control doors will be fitted with Door Open Too Long (DOTL) local alarms as per the SLHD policy. In general areas this shall be via a pulsed beeper fitted to the ceiling or wall above the door. In patient areas, the warning device may be changed to a blue strobe lamp (this is to reduce the disturbance to patients during times of door unserviceability).

7.35 Duress Alarms

The duress alarm system shall include voice functions and integrate into the existing system within Concord Centre for Mental Health (note CCMH existing duress system is due to be upgraded to a Wi-Fi system prior to the CFMH unit opening).

7.35.1 Fixed Duress

Fixed duress buttons will be strategically located throughout the healthcare facility. Final locations will be as per the requirements of the AusHFGs and Project User Group meetings and captured in the Room Data Sheets and Room Layout Sheets.

Fixed duress buttons will be used in well-defined areas where:

- The person works from a static position (e.g., where staff are behind a screen such as a pharmacy distribution window or behind a counter).
- The alarm can be discretely activated without the staff member leaving their normal working position.

Generally, fixed alarms will not be installed in areas accessible to patients and the public (e.g., corridors), as tampering with alarms may occur.

Fixed duress will be used as a back-up system to the mobile duress alarm system.

7.35.2 Mobile Duress

The Protecting People and Property: NSW Health Policy and Standards for Security Risk Management in NSW Health Agencies February 2022 states:

“Workers must wear NSW Health Agency provided personal duress alarms where they are required to answer public access doors after hours e.g., maternity units”.

All workers who are required to work within an emergency department must be provided with a personal duress alarm. The personal duress alarm must be worn at all times while working in this area.”

The mobile duress system shall include voice functions and integrate into the existing system within the Concord Centre for Mental Health.

Note: the existing mobile duress system is due to be upgraded to a Wi-Fi system prior to the completion of the new Concord Forensic Mental Health building.

To facilitate this an RTLS grade Wi-Fi network will be installed as per Section 7.22.4.

The intention is to provide the ability for telephony, messaging, and duress to be incorporated into one device. The system would require the provision of WLAN as well as a Real Time Locating System (RTLS) in order that the source of duress calls can be located with the required level of accuracy.

7.35.3 Wireless Local Area Network (WLAN)

The WLAN will utilise the same network that provides wireless coverage for ICT services.

7.35.4 Duress and Real Time Location System

In order to implement a duress alarm system over the Wi-Fi system, the system will require an RTLS controller. The RTLS controller utilises Received Signal Strength Indicator (RSSI) modeling to calculate a precise real-time location within the wireless network based on active measurement of all RSSI data from each Access Point (AP). As this system is Group 3 equipment, apart from the cabling to the APs, it is expected that SLHD ICT will nominate the AP locations.

A predictive heat map survey will need to be undertaken to inform the locations of the Wireless Access Points (WAPs).

7.36 Intercom

An IP based audio/video system will be provided within the new CFMH building.

The existing AIPhone IX series system utilised on the Concord campus will be extended to into the new CFMH building.

The intercom system will be integrated into the VoIP system.

Intercom entry and monitoring stations will be provided in locations agreed upon with User Groups and the LHD.

Intercom entry stations will be located as a minimum in the following locations:

- Main Entry
- Secure Entry and Secure Entry drop off area

Intercom master stations will be located as a minimum in the following locations:

- Reception
- Clinical Work Rooms

7.37 Maintenance - Replacement of Equipment

To be further considered during design finalisation and construction.

7.38 Design Life and Durability

The design life of electrical equipment is to be generally 20 to 30 years, as tabled below. The effective life can be limited by the availability of replacement parts. While the actual functional life of an installation is dependent on the use, maintenance regime and load applied to it, the following shall be used as a guide:

ITEM	MINIMUM DESIGN LIFE (YEARS)
High-Voltage feeders	30
High-Voltage switchgear	30
Liquid-filled transformers	30
Dry-type transformers	30
Standby generators	25
Uninterruptible Power Supplies (UPS)	20
Main Switchboards	25
Distribution Boards	25
Low-Voltage switchgear (moulded case and power circuit breaker)	25
Sub-Mains Cables	25
Sub-Circuit Cabling	20
Power Factor Correction	10
Interior lighting systems	7
External Luminaires	10
Emergency Lighting Systems (excluding Batteries)	7
Emergency Lighting batteries / single point luminaires (excluding Luminaires)	5
Information Communication and Technology cabling	20

7.39 Photovoltaic System

The new CFMH building will be provided with a new photovoltaic (PV) system, which will be connected into CFMH building main switchboard.

The capacity of the system is approximately 156kW. Refer to **Appendix H** for details.

8. Sustainability & Energy Saving Initiatives

The key sustainability objectives are:

- Comfortable and healthy indoor environment.
- Minimise non-renewable resource consumption.
- Cost-effectiveness over whole life span.

Minimisation of electrical consumption by ensuring that the design:

- Utilises energy efficient lamps LED, luminaires, and associated control gear.
- Consider lamp life and maintenance requirements when selecting light fittings.
- Optimise use of natural lighting during daylight hours.
- Provide individual light switching for individual spaces and master switches for each functional area.
- Provide automatic lighting control including:
- Building management system controls.
- Photoelectric controls.
- Time switches.
- Movement detectors.
- Use of sub metering for substantive energy uses within the building.
- Separate sub metering of lighting and power within new distribution boards.
- WELL Feature 54 Circadian Lighting Design

9. Value Engineering

The following potential value engineering items have been identified for consideration:

Value Engineering Option	Estimated CAPEX Saving	Pros	Cons
Use mid-range luminaires instead of waiting for the contractor to propose them	$100,000	Cost Effectiveness.	Cheaper quality lights
Reduce the target coverage area of the mobile/cellular in-building distributed antenna system	$100,000	Privacy - areas such as mental health present certain challenges. Privacy may be compromised if mobile technology users can easily upload or download inappropriate material or capture and disperse inappropriate images or audio. Both technical and operational management protocols should be considered. Cost effectiveness - areas such as plant rooms and the like may be simply too expensive to facilitate network coverage if there is no specific operational reason for coverage. Clinical - there may be clinical reasons why network coverage (or use of that coverage) may not be desirable for clinical purposes. This could include mental health wards where patients/consumers should not have access to mobile devices.	100% of building not provided with good mobile/cellular reception
Rationalise Power Distribution Infrastructure Provide only two (2) Electrical Distribution Board Cupboards on Ground Floor and Level 1 Provide only two (2) Electrical Distribution Boards (Non-Essential & Essential) per cupboard or DB location	$165,000	Cost Effectiveness. Reduces space and switchgear required for Electrical Distribution Boards.	Design departure from NSW HI ESG
Provide only one (1) power final subcircuit (Essential) per bedroom and associated ensuite.	$10,000	Cost Effectiveness. Reduces space and switchgear/circuit breakers required for Electrical Distribution Boards. Reduces quantity of RCDs required per bedroom and space required for RCDs within Clinical Work. Reduces LHD's ongoing operational expenditure associated with annual routine inspection and testing for RCDs as required by AS3003.	Design departure from NSW HI ESG

.

Appendix A – Preliminary Enquiry response from Ausgrid

Preliminary Enquiry – Response Letter

16/11/22 Webform ref: 781439

STANTEC AUSTRALIA PTY LTD
Attention: Allan Wong
Via email: allan.wong@stantec.com

Premises address: **HOSPITAL ROAD, CONCORD WEST**

Ausgrid AE Reference: **700008131**

Dear Allan

I refer to your preliminary enquiry regarding the electricity connection at the above address and provide the following information.

Existing Arrangement

- ❑ Substation S.35340 Hospital Rd No 3
  - Is a 800kVA Kiosk substation with a non-firm rating of 1169amps.
  - Low voltage distributor LVF: 1 supplies Acute Psychiatric Unit. This distributor fuse-way is rated at 1200amps with a 1000amp fuse installed. An MDI reading on this distributor indicates a load in the order of 680 amps.

- ❑ Substation S.35341 Hospital Rd No 4
  - Is a 800kVA Kiosk substation with a non-firm rating of 1169amps.
  - Low voltage distributor LVF: 1 supplies Anzac Centre. This distributor fuse-way is rated at 1200amps with a 1000amp fuse installed. An MDI reading on this distributor indicates a load in the order of 1100 amps.

Increased Supply Options

- ❑ Substation S.35340 Hospital Rd No 3
  - Change substation fuses to 1200amp and increase SPD setting to 1100amps. Note: this is not confirmation the the consumers mains or MSB are suitable for this size supply.
  - Upgrade substation to 1000kVA and a 1600/400/400 LV board.
    Fuse Direct distributor at 1600amps. Note: SPD will be set at approx. 1400amps (TBC during MSB design)
- ❑ Substation S.35341 Hospital Rd No 4
  - Change substation fuses to 1200amp and increase SPD setting to 1100amps. This should be done to accommodate existing loads. An application would need to be submitted to instigate this.
  - Based on MDI readings no additional load can be connected to this subtation.
  - Upgrade substation to 1000kVA and a 1600/400/400 LV board.
    Fuse Direct distributor at 1600amps. Note: SPD will be set at approx. 1400amps (TBC during MSB design)
- ❑ If further capacity than this is required an additional substation will need to be installed
- ❑ An extension/augmentation of the Ausgrid network is Contestable and requires the customer to engage accredited service providers to undertake the design and construction of the required works. Information on how to connect to the Ausgrid network can be found on our website at the following link: https://www.ausgrid.com.au/Connections
- ❑ Ausgrid is unable to provide costs or timeframes for Contestable works. However, accredited service providers may be able to provide the information.
- ❑ The electrical connection will require Ausgrid to provide auxiliary services that only Ausgrid can provide. The auxiliary services and the associated fee are detailed in the Ausgrid document ***Alternative control services fee schedule.***. The document is available on our website at the following link: https://www.ausgrid.com.au/Connections/charges
- ❑ Information regarding the private installation such as service fuse size, private protection settings, cable size(s) and so forth requires you to arrange suitably trained electrical persons to obtain the desired information about the private installation. Gathering this information may also require you to make arrangements for an interruption of electricity to the customer(s) connected to the private installation.
- ❑ Being an older installation where a connection offer is yet to be made under NECF the approved connection capacity is not readily available. It should be noted that when the maximum connection capacity is not utilised by

the customer it is reduced to actual maximum demand and any subsequent surplus can be or may have been used by Ausgrid to supply others.

- ❑ To proceed further in obtaining a new or altered electrical connection to the property a Connection Application will need to be submitted. The various application forms are available on our website at the following link: https://www.ausgrid.com.au/Connections

It should be noted that the above advise is based on Ausgrid's polices and network status as of today and are subject to change.

Connections to the Ausgrid network are governed by a set of laws and rules referred to as the National Energy Customer Framework (NECF). Included in the NECF is the National Electricity Rules (NER). Under these rules, a binding contract may only be formed after a connection application is lodged and Ausgrid has made a connection offer in response to that application. Accordingly, to make arrangements for the electricity connection of the development to the Ausgrid network you should lodge a completed connection application.

Should you require any further information please contact me.

Yours sincerely,

Dane Davis

Ausgrid

Direct Telephone Number: 0295855923
Email: ddavis@ausgrid.com.au

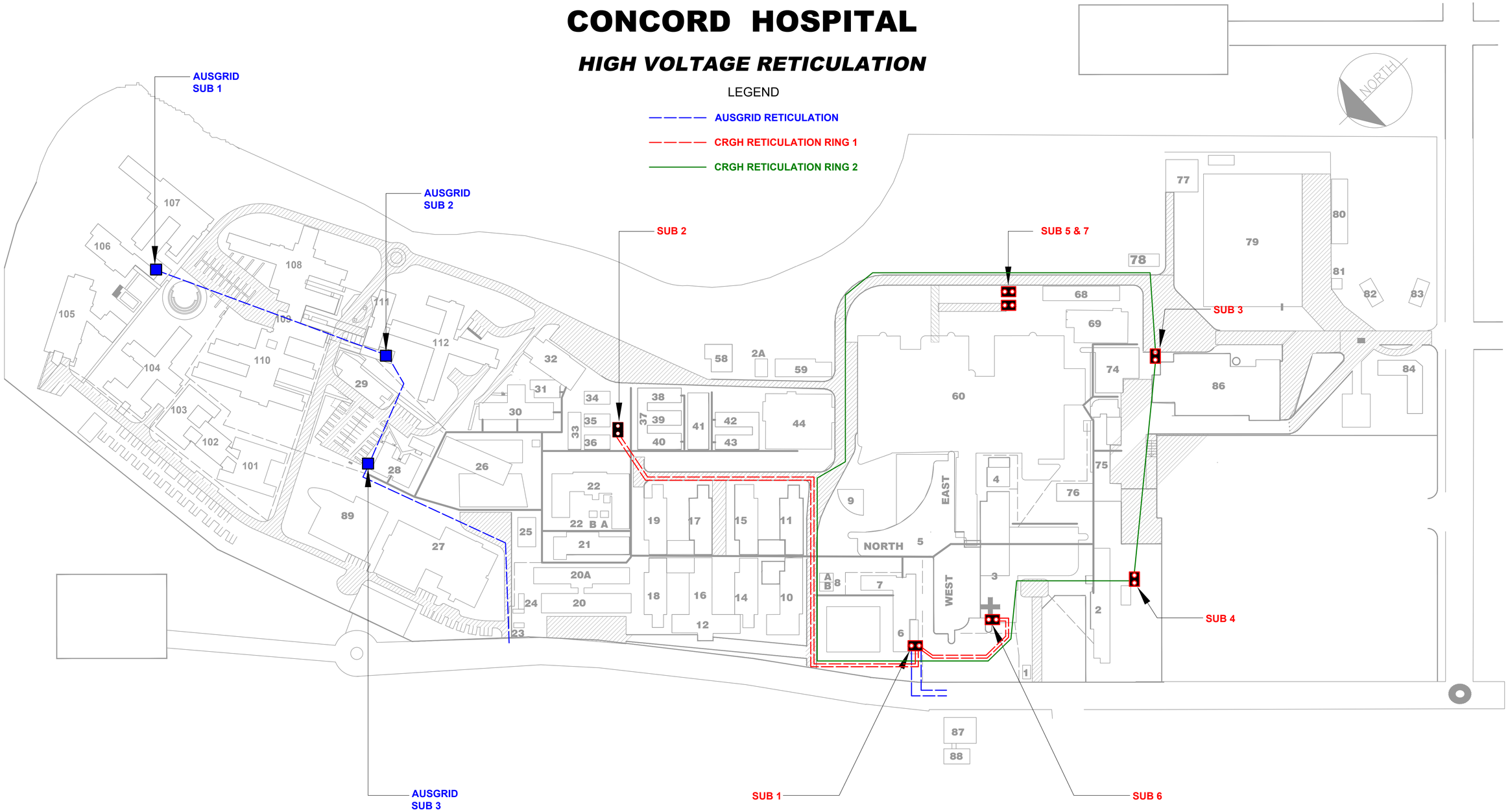
Appendix B – Site Services Plans

CONCORD HOSPITAL

HIGH VOLTAGE RETICULATION

LEGEND

- AUSGRID RETICULATION
- CRGH RETICULATION RING 1
- CRGH RETICULATION RING 2



CONCORD HOSPITAL ENGINEERING SERVICES RESIDENTIAL QUARTERS BUILDING 75 CONCORD HOSPITAL HOSPITAL ROAD CONCORD NSW 2139 PH : 9767–6376 FAX: 9767–8020	DRAWING TITLE CONCORD HOSPITAL SITE SERVICES PLAN ELECTRICAL SERVICES HIGH VOLTAGE RETICULATION
DRAWN BY: KSG	SCALE @ A1: AS SHOWN
APPROVED FOR ISSUE:	
DATE: 25–11–19	JOB No. A1
DRAWING No: CON HIGH VOLTAGE – 1	Revision: AB

CONCORD HOSPITAL

EMERGENCY GENERATORS AND THE AREAS THEY SUPPLY

LEGEND

- DOES NOT HAVE EITHER NON ESSENTIAL OR ESSENTIAL POWER SUPPLIES
- AREA HAS BOTH ESSENTIAL & NON ESSENTIAL POWER SUPPLIES
- ESSENTIAL POWER

GENERATOR FOR BLDGS 101 TO 107

GENERATOR FOR BLDGS 108 TO 112

GENERATOR FOR BUILDING 20A, 22, 30 - 36, 41, 42, 43

GENERATOR FOR BUILDING 44, 59

GENERATOR FOR BLDGS 44, 3 LEVELS LG, G, 1 ZONES A + B

GENERATOR FOR BUILDING 28

GENERATOR FOR BLDG 89

GENERATOR FOR BLDG 27

GENERATOR FOR BLDGS 11,12,15,16,17,18,19,10,14

GENERATOR FOR BLDGS 5, 88

GENERATOR FOR BLDG 2 + 75

GENERATOR FOR BLDGS 86,69

GENERATOR FOR BLDG 3 WEST & SOUTH E, C, D

0 50m 100m

CONCORD HOSPITAL
ENGINEERING SERVICES
RESIDENTIAL QUARTERS
BUILDING 75
CONCORD HOSPITAL
HOSPITAL ROAD
CONCORD NSW 2139

PH : 9767-6376
FAX: 9767-8020

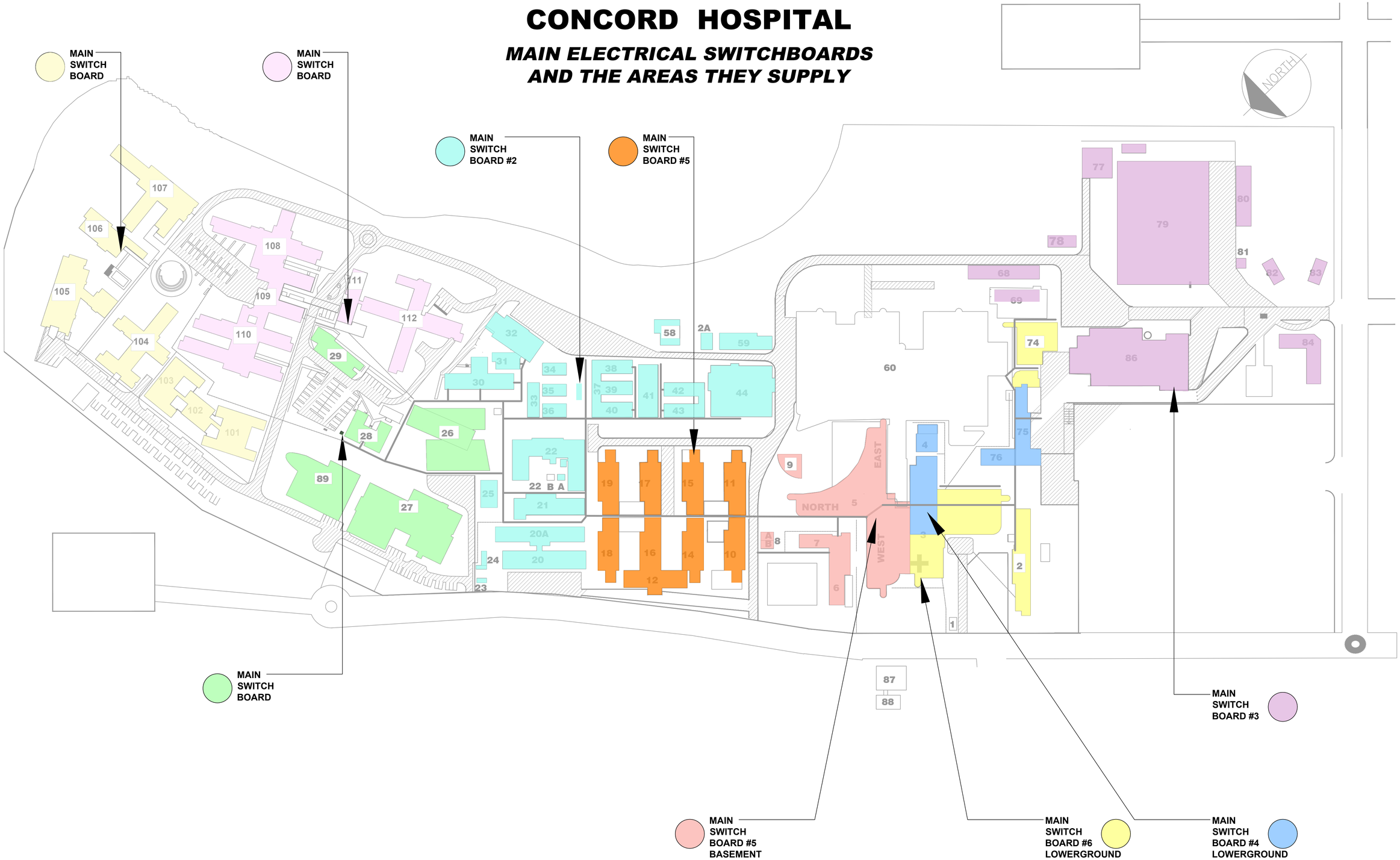
DRAWING TITLE
CONCORD HOSPITAL
SITE SERVICES PLAN

ELECTRICAL SERVICES
EMERGENCY GENERATORS AND THE AREAS THEY SUPPLY

DRAWN BY: KSG	SCALE @ A1: AS SHOWN
APPROVED FOR ISSUE:	
DATE: 25-11-19	JOB No. A1
DRAWING No: CON EMERGENCY GENERATORS – 1	Revision: AB

CONCORD HOSPITAL

MAIN ELECTRICAL SWITCHBOARDS AND THE AREAS THEY SUPPLY



CONCORD HOSPITAL
ENGINEERING SERVICES
RESIDENTIAL QUARTERS
BUILDING 75
CONCORD HOSPITAL
HOSPITAL ROAD
CONCORD NSW 2139

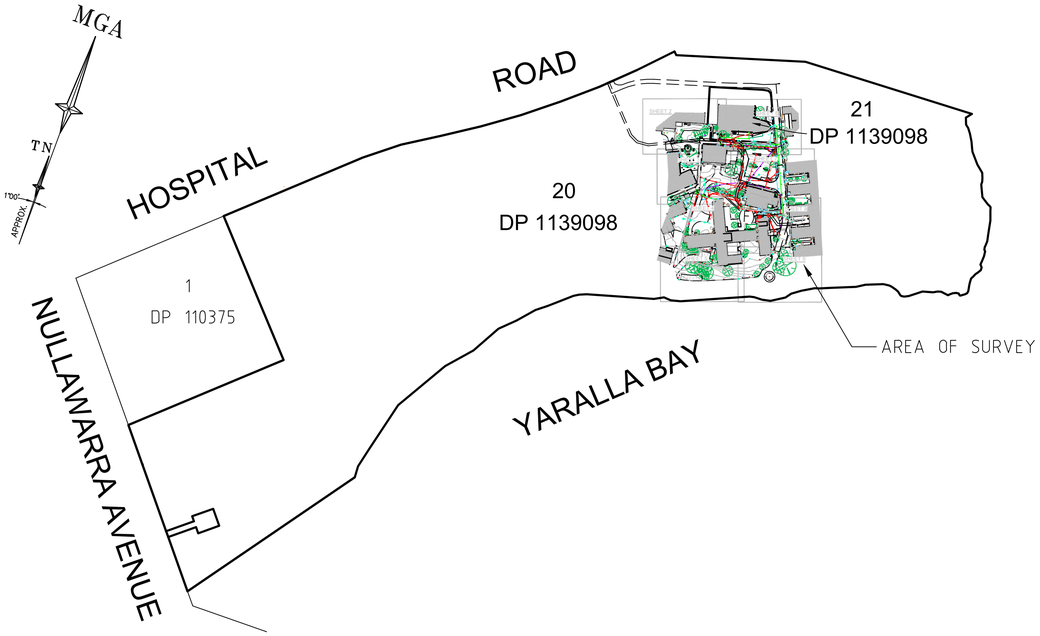
PH : 9767-6376
FAX: 9767-8020

DRAWING TITLE
CONCORD HOSPITAL
SITE SERVICES PLAN

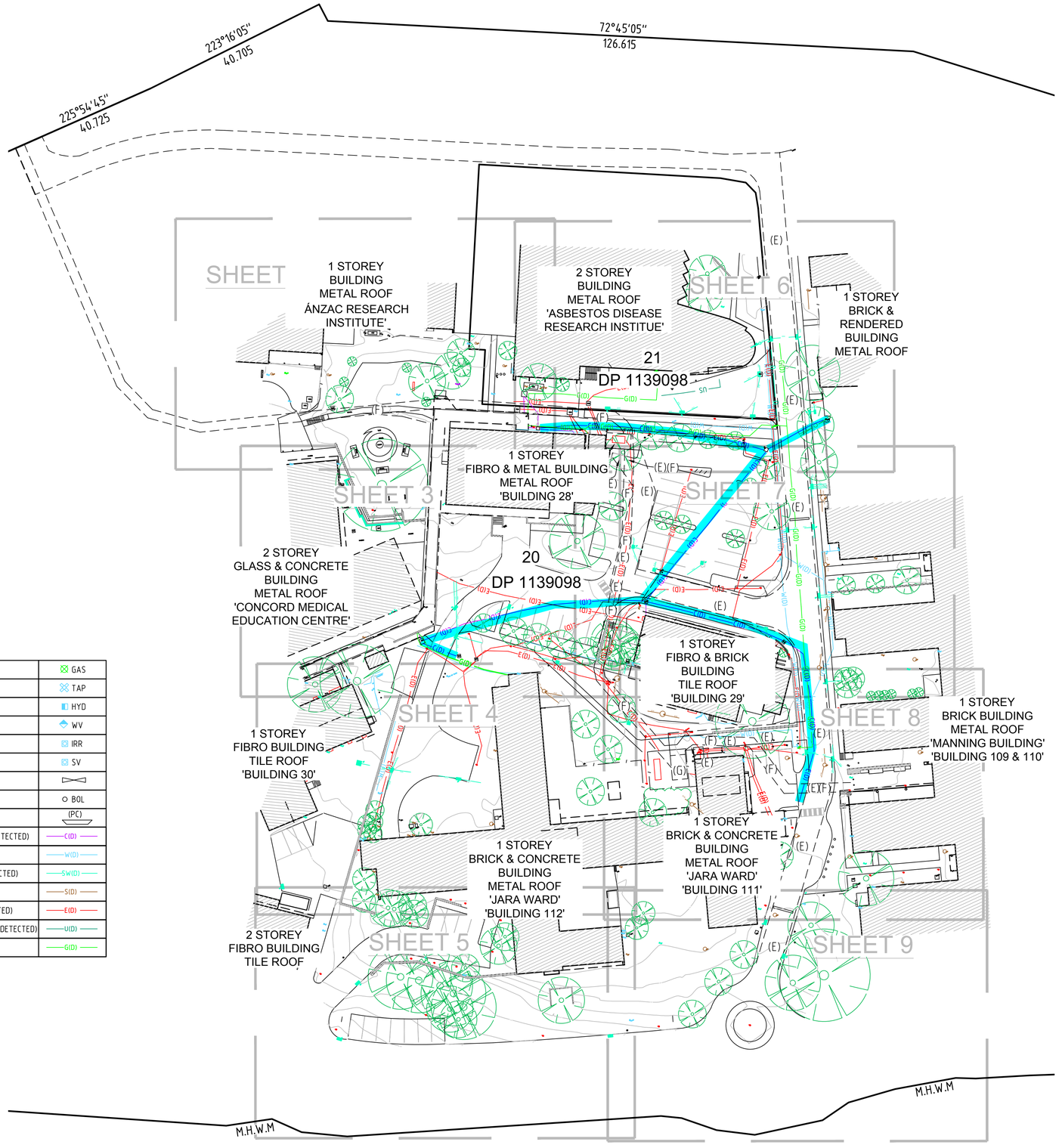
ELECTRICAL SERVICES
MAIN SWITCHBOARDS AND THE AREA THEY SUPPLY

DRAWN BY: KSG	SCALE @ A1: AS SHOWN
APPROVED FOR ISSUE:	
DATE: 25-11-19	JOB No. A1
DRAWING No: CON MAIN ELECTRICAL SWITCHBOARDS – 1	Revision: AB

Appendix C – Survey



LOCATION DIAGRAM



EASEMENTS

(E) DENOTES RIGHT OF CARRIAGER WAY VARIABLE WIDTH (DP1158616)
(VIDE SURVEY BY MR SURVEYOR - STEPHEN R EMERY DATED 13-11-07)
(F) DENOTES EASEMENT FOR ELECTRICITY AND OTHER PURPOSES 2 WIDE AND VARIABLE WIDTH (DP1158616)
(VIDE SURVEY BY MR SURVEYOR - STEPHEN R EMERY DATED 13-11-07)
(G) DENOTES PROPOSED EASEMENT FOR ELECTRICITY AND OTHER OTHER PURPOSES 3.3 WIDE (DP1158616)
(VIDE SURVEY BY MR SURVEYOR - STEPHEN R EMERY DATED 13-11-07)

NOTES

1. THE BOUNDARIES HAVE NOT BEEN MARKED ON GROUND
2. THE BOUNDARY SURVEY (DIMENSIONS AND AREA) HAVE BEEN SURVEYED IN ACCORDANCE WITH SURVEYING AND SPATIAL INFORMATION REGULATION 2017 CLAUSE 10 "IDENTIFICATION SURVEYS" AND ARE SUBJECT TO FINAL SURVEY
3. ORIGIN OF **MGA2020** COORDINATES IS TAKEN FROM **SSM 114207** - E:**323428.773**, N:**6254260.312** IN HOSPITAL ROAD **(14/05/2021)**
4. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM **SSM 114207** R.L. **11.775** (A.H.D.) IN HOSPITAL ROAD
5. CONTOUR INTERVAL **0.5 m**
6. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
7. KERB LEVELS ARE TO THE TOP OF KERB UNLESS SHOWN OTHERWISE
8. FLOOR LEVELS SHOWN ARE THRESHOLD LEVELS. NO INVESTIGATION OF INTERNAL FLOOR LEVELS HAS BEEN UNDERTAKEN
9. AN INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. UNDERGROUND SERVICES HAVE BEEN DETECTED BY "QASAR " AND ARE APPROXIMATE ONLY. SOME SERVICES SUCH AS FIRE&WATER SUPPLY, GAS AND OPTICAL FIBRE CABLING DO NOT HAVE METALLIC TRACING WIRES OR METAL PIPES AND MAY NOT HAVE BEEN DETECTED.
10. 8/.4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
11. SHOWS APPROXIMATE POSITION OF ROAD LINEMARKING AND IS INDICATIVE ONLY
12. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH

LEGEND

BENCH MARK	▲	GAS VALVE	GAS
INSPECTION PIT	IP	WATER TAP	TAP
PIT WITH CONCRETE LID	CLID	HYDRANT	HYD
PIT WITH METAL LID	MLID	WATER VALVE	WV
COMMS PIT	COM	IRRIGATION	IRR
ELECTRICITY PIT	EPIT	STOP VALVE	SV
POWER POLE	PP	GATE	
ELECTRIC LIGHT BOLLARD	LB	BOLLARD	BOL
ELECTRIC LIGHT POLE	ELP	PRAM CROSSING	(PC)
SEWER MANHOLE	SMH	COMMUNICATIONS (DETECTED)	C(D)
SEWER INSPECTION POINT	SIP	WATER (DETECTED)	W(D)
GIPD DRAIN		STORMWATER (DETECTED)	SW(D)
GIPD DRAIN	GD	SEWER (DETECTED)	S(D)
GIPD INLET PIT	GIP	ELECTRICITY (DETECTED)	E(D)
DOWNPIPE	DP	UNKNOWN SERVICE (DETECTED)	U(D)
		GAS (DETECTED)	G(D)

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 10 20 30 40 50

SCALE 1:500 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

LTS CONFIDENCE TOGETHER
www.ltsi.com.au | P 1300 587 000

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

.....
Registered Surveyor NSW

Client - HEALTH INFRASTRUCTURE

Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum AHD
site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:500 @A1
date of survey 15/08/2022
SHEET OF 11 | 1

MGA

TN

100° APPROX.

1 STOREY
BUILDING
METAL ROOF
ÁNZAC RESEARCH INSTITUTE'

20
DP 1139098

20
DP 1139098

PLANT
CONCRETE PLINTH

CONCRETE LOADING DOCK

STEPS

GRASS

CONCRETE

BITUMEN TURNING BAY

GRAVEL

FOOTPATH

BOTTOM OF BANK

TOP OF BANK

CLID

MLID

SWITCHB

METAL AWNING

METAL FENCE

PARAPET 17.66

PARAPET 16.84

PAVERS

BLOCK

TILED

FIREPIT

SEAT

GRAVEL

CONCRETE

TOP OF GUTTER 11.95

METAL AWNING OVER

1 STOREY
FIBRO &
METAL
BUILDING
METAL ROOF
'BUILDING 28'

ADJOINS

ADJOINS

SHEET 6

SHEET 3

SEE SHEET 1 FOR LEGEND & NOTES

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 2 4 6 8 10

SCALE 1:100 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00

Revision	Date	Description	Reference
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

LTS CONFIDENCE TOGETHER
www.ltsl.com.au | P 1300 587 000

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

.....
Registered Surveyor NSW

Client - HEALTH INFRASTRUCTURE

Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum AHD
site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 2 OF 11

ADJOINS

SHEET 2

MGA

TN

APPROX.

2 STOREY
GLASS & CONCRETE BUILDING
METAL ROOF
'CONCORD MEDICAL EDUCATION CENTRE'

20
DP 1139098

1 STOREY
FIBRO &
METAL
BUILDING
METAL ROOF
'BUILDING 28'

PLANT
INACCESIBLE

PLANT
INACCESIBLE

METAL
SHED

METAL
SHED

GARAGE

SEE ELEVATIONS FOR PARAPET LEVELS

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS

SHEET 4

SHEET 7

ADJOINS

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 2 4 6 8 10

SCALE 1:100 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

LTS CONFIDENCE TOGETHER
www.ltslcom.au | P 1300 587 000

THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

.....
Registered Surveyor NSW

Client - HEALTH INFRASTRUCTURE

Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum	AHD	reference number	33907 020DT
site Area	N/A	scale	1:100 @A1
LGA	CANADA BAY	date of survey	15/08/2022
		SHEET OF	3 11

ADJOINS
SHEET 3

SEE SHEET 1 FOR LEGEND & NOTES
ADJOINS
SHEET 5

SCALE 1:100 @ A1

Revision	Date	Description	Reference	Revision	Date	Description	Reference
H	00/00/00	-	00	D	00/00/00	-	00
G	00/00/00	-	00	C	00/00/00	-	00
F	00/00/00	-	00	B	00/00/00	-	00
E	00/00/00	-	00	A	00/00/00	-	00

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THIS IS THE PLAN REFERRED TO IN MY LETTER DATED:

Registered Surveyor NSW

Client - HEALTH INFRASTRUCTURE

Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum AHD
reference number 33907 020DT
site Area N/A
scale 1:100 @A1
date of survey 15/08/2022
LGA CANADA BAY
SHEET 4 OF 11

ADJOINS

SHEET 4

CONTAINER

TOP OF GUTTER 10.88

RIDGE 14.11

2 STOREY FIBRO BUILDING TILE ROOF

GARDEN

BRICK RET WALL

KERB

GRASS

ROAD

ACCESS

BITUMEN

PAVED

FOOTPATH

BRICK RET

WALL

GARDEN

SIGN

PAVED

PARKING

(PC)

GARDEN

GARDEN

MGA

TN

APPROX. 1°00'

METAL AWNING

RETAIN WALL

GARDEN

PARAPET 11.59

GRASS

WALL

TIMBER RET

GRASS

BITUMEN

PARKING

TOP

OF

KERB

ROAD

ACCESS

BITUMEN

SHEET 9

ADJOINS

20

DP 1139098

H.W.M

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GDA2020

0 2 4 6 8 10

SCALE 1: 100 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

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datum AHD

site Area N/A

LGA CANADA BAY

reference number 33907 020DT

scale 1:100 @A1

date of survey 15/08/2022

SHEET 5 OF 11

MGA

TN

APPROX. 1000

SHEET 2

ADJOINS

2 STOREY
BUILDING
METAL ROOF
'ASBESTOS DISEASE RESEARCH INSTITUE'

21

DP 1139098

1 STOREY
BRICK &
RENDERED
BUILDING
METAL ROOF

1 STOREY
FIBRO &
METAL
BUILDING
METAL ROOF
'BUILDING 28'

METAL
SHED

PLANT

(E)

(F)

(G)

WALL

FOOTPATH

GRAVEL

GARDEN

CONCRETE

BITUMEN

ACCESS

METAL FENCE

PARAPET 14.36

PARAPET 14.60

PARAPET 14.70

CONCRETE FOOTPATH

AWNING OVER

AWNING 13.21

RENDERED WALL

PARAPET 14.61

PARAPET 14.38

GATE

STEPS

PARAPET 17.66

TOP REND WALL 17.66

GRASS

LOADING

DOCK

ROAD

BRICK RET WALL

SUBSTATION KIOSK

TOP OF GUTTER 12.23

TOP OF GUTTER 12.69

BITUMEN CARPARK

FOOTPATH

KERB

TOP

OF

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS

SHEET 7

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GDA2020

0 2 4 6 8 10

SCALE 1:100 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	00/00/00	-	00

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datum AHD
site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 6 OF 11

ADJOINS
SHEET 6

MGA
TN
1°00'
APPROX.

PLANT INACCESIBLE
METAL SHED
BITUMEN CARPARK
GRASS
CONCRETE
FOOTPATH
ROAD
ACCESS
PAVED
RENDERED WALL
FENCE
GATE
METAL
KERB
TOP OF GUT
BANK
EDGE OF BITUMEN
BIKE RACKS
SPEED BUMP
SIGN
AWNING
RAMP
STEPS
WALL
PALING FENCE
CONCRETE DISH DRAIN
PALING TOP OF GUTTER 11.75
CONCRETE TOP OF GUTTER 11.77
RIDGE 15.13
RIDGE 14.05
AWNING 11.15
PARAPET 12.59

1 STOREY
FIBRO & BRICK
BUILDING
TILE ROOF
'BUILDING 29'

1 STOREY
BRICK BUILDING
METAL ROOF
'MANNING BUILDING'
'BUILDING 109 & 110'

20
DP 1139098

SHEET 3
ADJOINS
SHEET 8

SEE SHEET 1 FOR LEGEND & NOTES

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GDA2020

0 2 4 6 8 10
SCALE 1:100 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
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datum	AHD
site Area	N/A
LGA	CANADA BAY
reference number	33907 020DT
scale	1:100 @A1
date of survey	15/08/2022
SHEET	7
OF	11

ADJOINS

SHEET 7

SHEET 4

ADJOINS

1 STOREY FIBRO & BRICK BUILDING TILE ROOF 'BUILDING 29'

1 STOREY BRICK & CONCRETE BUILDING METAL ROOF 'JARA WARD' 'BUILDING 111'

1 STOREY BRICK BUILDING METAL ROOF 'MANNING BUILDING' 'BUILDING 109 & 110'

1 STOREY BRICK BUILDING METAL ROOF 'MANNING BUILDING' 'BUILDING 109 & 110'

1 STOREY BRICK BUILDING METAL ROOF 'MANNING BUILDING' 'BUILDING 109 & 110'

20
DP 1139098

MGA

TN

APPROX

SEE SHEET 1 FOR LEGEND & NOTES

ADJOINS

SHEET 9

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SCALE 1:100 @ A1

Revision	Date	Description	Reference
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site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 8 OF 11

ADJOINS

SHEET 8

SHEET 5

ADJOINS

METAL AWNING

REND WALL

GRASS

GRASS

GRASS

GARDEN

GARDEN

(E)

ROAD

KERB

SPEED BUMP

CONCRETE

PAVERS

ACCESS

SIGN

TOP

BITUMEN

FENCE

1 STOREY
BRICK BUILDING
METAL ROOF
'MANNING BUILDING'
'BUILDING 109 & 110'

20

DP 1139098

M.H.W.M

MGA

TN

APPROX. 10.0°

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SCALE 1:100 @ A1

Revision	Date	Description	Reference
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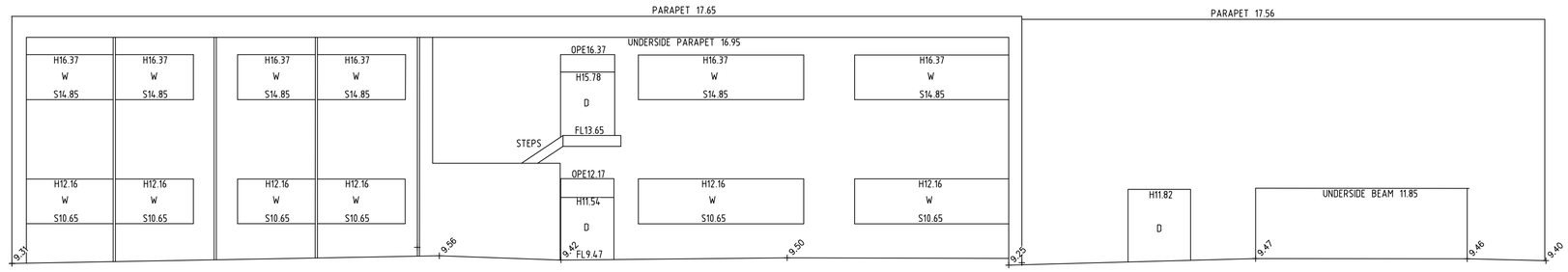
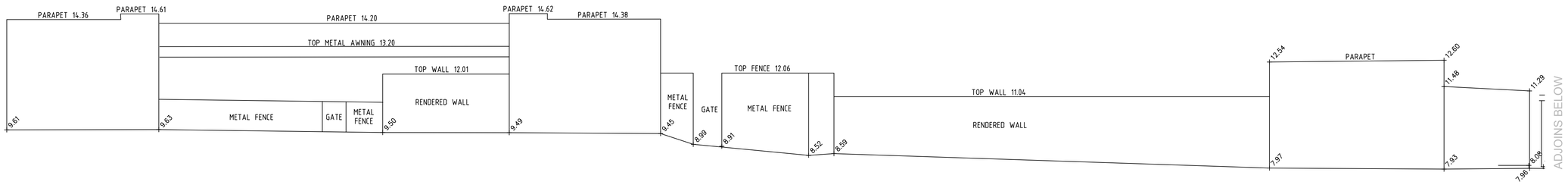
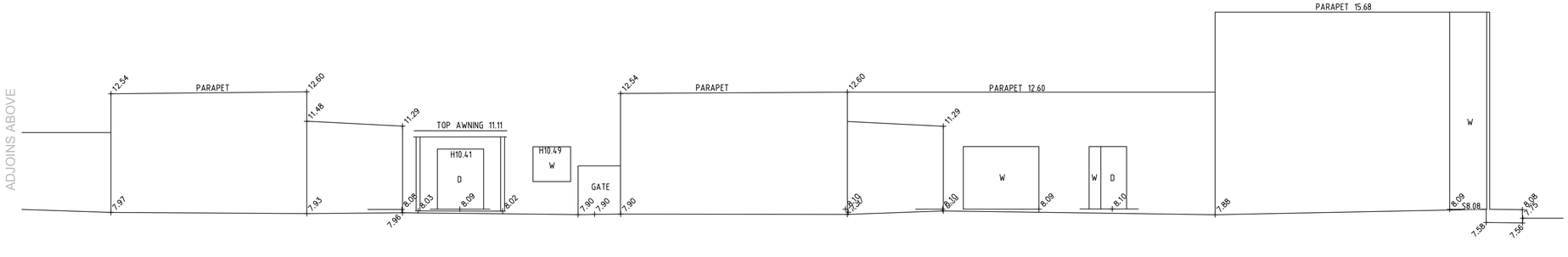
scale 1:100 @A1
date of survey 15/08/2022
SHEET 9 OF 11



ASBESTOS DISEASE RESEARCH INSTITUTE
SOUTHERRN ELEVATION



MANNING BUILDING & STREETSCAPE - BUILDING No. 109 & 110
WESTERN ELEVATION



MANNING BUILDING & STREETSCAPE - BUILDING No. 109 & 110
WESTERN ELEVATION

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GDA2020

0 10 20 30 40 50

SCALE 1:500 @ A1

Revision	Date	Description	Reference
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F	00/00/00	-	00
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Revision	Date	Description	Reference
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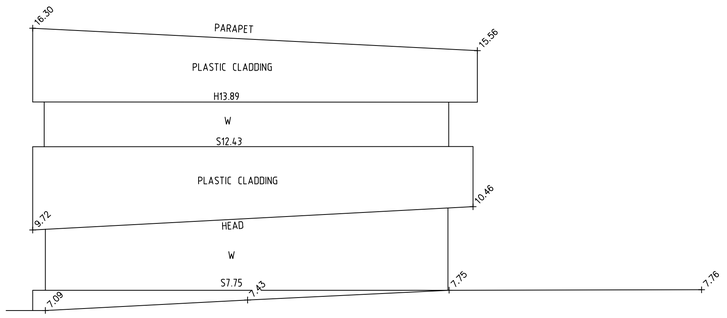
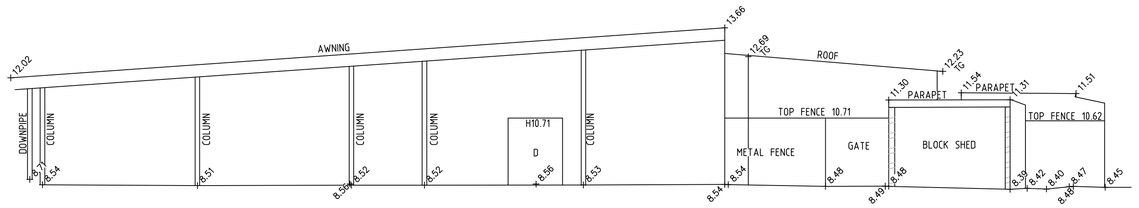
datum AHD
site Area N/A
LGA CANADA BAY

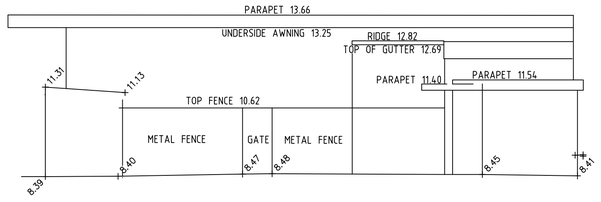
reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 10 OF 11



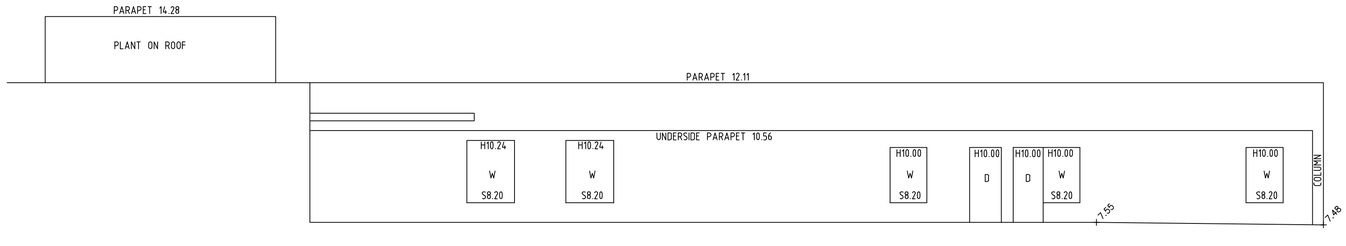
CONCORD MEDICAL EDUCATION CENTRE
EASTERN ELEVATION



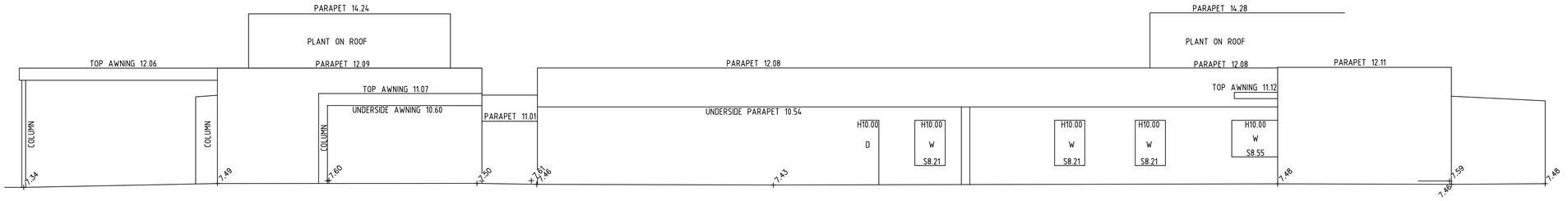
BUILDING No 28
SOUTHERN ELEVATION



BUILDING No 28
SOUTHERN ELEVATION



JARA WARD BUILDING No 112)
EASTERN ELEVATION



JARA WARD BUILDING No 111 + 112)
NORTHERN ELEVATION

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0 10 20 30 40 50

SCALE 1:500 @ A1

Revision	Date	Description	Reference
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Drawing title
PLAN OF DETAIL AND LEVELS OVER PART LOT 20 IN DP1139098 KNOWN AS CONCORD HOSPITAL, CONCORD WEST

datum AHD
site Area N/A
LGA CANADA BAY

reference number 33907 020DT
scale 1:100 @A1
date of survey 15/08/2022
SHEET 11 OF 11

Appendix D – Preliminary Maximum Demand Calculation

Electrical Maximum Demand Calculation

Project: Concord Forensic Mental Health
Project-No: 301351044
Revision: 7
Date: 2023-02-11

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Level 2	10NO. WORKPOINTS	34.2	85	2.91	**4.20**
Level 2	2 PERSON OFFICE	11.88	85	1.01	**1.46**
Level 2	25NO. WORKPOINTS	86.5	85	7.35	**10.61**
Level 2	ABW	31.74	85	2.70	**3.89**
Level 1	ACC ENSUITE (7)	6.7	20	0.13	**0.19**
Level 1	ACC ENSUITE (7)	6.51	20	0.13	**0.19**
Ground Floor	ACC ENSUITE 9 (7)	6.68	20	0.13	**0.19**
Ground Floor	ACC MEDIUM SECURE BEDROOM 9 (18)	18.45	20	0.37	**0.53**
Ground Floor	ACC WC	7.33	20	0.15	**0.21**
Level 2	ACC WC	6.79	20	0.14	**0.20**
Ground Floor	ACTIVITY / THERAPY (20)	18.65	85	1.59	**2.29**
Ground Floor	AIRLOCK (6)	6.68	20	0.13	**0.19**
Level 1	BALCONY GARDEN 1	114.25	5	0.57	**0.82**
Level 1	BALCONY GARDEN 2	53.3	5	0.27	**0.38**
Level 1	BEV BAY (3)	2.26	85	0.19	**0.28**
Ground Floor	BEVERAGE BAY (3)	4.25	85	0.36	**0.52**
Ground Floor	BULK STORES (20)	19.54	20	0.39	**0.56**
Ground Floor	CIRC	13.45	20	0.27	**0.39**
Ground Floor	CIRC	34.05	20	0.68	**0.98**
Ground Floor	CIRC	231.16	20	4.62	**6.67**
Ground Floor	CIRC	58.06	20	1.16	**1.68**
Ground Floor	CIRC	7.44	20	0.15	**0.21**
Ground Floor	CIRC	16.01	20	0.32	**0.46**
Ground Floor	CIRC	7.7	20	0.15	**0.22**
Level 1	CIRC	9.01	20	0.18	**0.26**
Level 1	CIRC	34.75	20	0.70	**1.00**
Level 1	CIRC	118.03	20	2.36	**3.41**
Level 2	CIRC	33.58	20	0.67	**0.97**
Level 2	CIRC	28.57	20	0.57	**0.82**
Ground Floor	CLEAN LINEN (2)	2.23	20	0.04	**0.06**
Ground Floor	CLEAN LINEN (2)	2.05	20	0.04	**0.06**
Level 1	CLEAN UTILITY (10)	9.67	85	0.82	**1.19**
Ground Floor	CLEANER (5)	4.5	20	0.09	**0.13**
Level 1	CLEANER (5)	4.83	20	0.10	**0.14**
Ground Floor	CLINICAL WORKROOM (17)	24.25	85	2.06	**2.98**
Level 1	CLINICAL WORKROOM (17)	18.18	85	1.55	**2.23**
Ground Floor	COMMS	13.52	200	2.70	**3.90**
Level 1	COMMS	13.52	200	2.70	**3.90**
Level 2	COMMS ROOM	10.8	200	2.16	**3.12**
Ground Floor	CONSULT (14)	14.22	85	1.21	**1.74**
Level 1	CONSULT (14)	14.4	85	1.22	**1.77**
Ground Floor	COURTYARD	25.18	5	0.13	**0.18**
Ground Floor	DE-ESCALATION ROOM (18)	18.28	85	1.55	**2.24**
Ground Floor	DINING ROOM (40)	39.57	85	3.36	**4.85**
Ground Floor	DIRTY LINEN	1.09	20	0.02	**0.03**
Ground Floor	DIRTY LINEN (.5)	0.79	20	0.02	**0.02**
Ground Floor	DIRTY LINEN (.5)	0.97	20	0.02	**0.03**
Ground Floor	DIRTY UTILITY (8)	7.91	85	0.67	**0.97**
Level 1	DISPOSAL (4)	5.1	20	0.10	**0.15**
Ground Floor	DISPOSAL ROOM (12)	11.84	20	0.24	**0.34**
Ground Floor	EDB	2.83	20	0.06	**0.08**
Ground Floor	EDB	2.36	20	0.05	**0.07**
Level 1	EDB	2.83	20	0.06	**0.08**
Level 1	EDB	1.07	20	0.02	**0.03**
Level 1	ENSUITE	5	20	0.10	**0.14**
Level 1	ENSUITE	5	20	0.10	**0.14**
Ground Floor	ENSUITE 1	4.82	20	0.10	**0.14**
Level 1	ENSUITE 1	4.81	20	0.10	**0.14**
Level 1	ENSUITE 1	4.81	20	0.10	**0.14**
Level 1	ENSUITE 1	4.8	20	0.10	**0.14**
Level 1	ENSUITE 1	4.76	20	0.10	**0.14**
Ground Floor	ENSUITE 10	4.77	20	0.10	**0.14**
Ground Floor	ENSUITE 11	4.81	20	0.10	**0.14**
Ground Floor	ENSUITE 12	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 13	4.75	20	0.10	**0.14**

Stantec

Electrical Maximum Demand Calculation

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Ground Floor	ENSUITE 14	4.81	20	0.10	**0.14**
Ground Floor	ENSUITE 15	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 16	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 17	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 18	4.78	20	0.10	**0.14**
Ground Floor	ENSUITE 2	4.84	20	0.10	**0.14**
Level 1	ENSUITE 2	4.84	20	0.10	**0.14**
Level 1	ENSUITE 2	4.84	20	0.10	**0.14**
Level 1	ENSUITE 2	4.79	20	0.10	**0.14**
Level 1	ENSUITE 2	4.79	20	0.10	**0.14**
Ground Floor	ENSUITE 3	4.82	20	0.10	**0.14**
Level 1	ENSUITE 3	4.6	20	0.09	**0.13**
Level 1	ENSUITE 3	4.64	20	0.09	**0.13**
Level 1	ENSUITE 3	4.64	20	0.09	**0.13**
Level 1	ENSUITE 3	4.59	20	0.09	**0.13**
Ground Floor	ENSUITE 4	4.81	20	0.10	**0.14**
Level 1	ENSUITE 4	4.82	20	0.10	**0.14**
Level 1	ENSUITE 4	4.82	20	0.10	**0.14**
Level 1	ENSUITE 4	4.82	20	0.10	**0.14**
Level 1	ENSUITE 4	4.75	20	0.10	**0.14**
Ground Floor	ENSUITE 5	4.82	20	0.10	**0.14**
Level 1	ENSUITE 5	4.85	20	0.10	**0.14**
Level 1	ENSUITE 5	4.85	20	0.10	**0.14**
Level 1	ENSUITE 5	4.8	20	0.10	**0.14**
Level 1	ENSUITE 5	5.06	20	0.10	**0.15**
Ground Floor	ENSUITE 6	4.84	20	0.10	**0.14**
Ground Floor	ENSUITE 7	4.82	20	0.10	**0.14**
Ground Floor	ENSUITE 8	4.81	20	0.10	**0.14**
Ground Floor	EXERCISE ROOM (22)	21.84	85	1.86	**2.68**
Level 1	FAMILY INTERVIEW (18)	19.18	85	1.63	**2.35**
Ground Floor	FAMILY INTERVIEW ROOM (18)	17.08	85	1.45	**2.10**
Ground Floor	FIRE	2.74	20	0.05	**0.08**
Ground Floor	FIRE	2.63	20	0.05	**0.08**
Level 2	FOCUS ROOM 1	6.28	85	0.53	**0.77**
Level 2	FOCUS ROOM 2	6.3	85	0.54	**0.77**
Level 2	FOCUS ROOM 3	6.48	85	0.55	**0.80**
Level 1	GROUP THERAPY (30)	12.38	85	1.05	**1.52**
Ground Floor	HANDWASHING BAY	1.84	20	0.04	**0.05**
Ground Floor	HWB	0.78	20	0.02	**0.02**
Ground Floor	HWB	0.91	20	0.02	**0.03**
Ground Floor	INTERVIEW (14)	13.69	85	1.16	**1.68**
Ground Floor	INTERVIEW (14)	14.57	85	1.24	**1.79**
Ground Floor	INTERVIEW (14)	13.46	85	1.14	**1.65**
Level 1	INTERVIEW ROOM - MH (14)	16.75	85	1.42	**2.06**
Ground Floor	IT RESOURCE (20)	19.84	85	1.69	**2.43**
Level 1	KITCHEN (10)	9.57	100	0.96	**1.38**
Level 1	KITCHEN (10)	9.53	100	0.95	**1.38**
Ground Floor	KITCHEN (24)	24.29	100	2.43	**3.51**
Level 1	KITCHEN 1 (10)	9.64	100	0.96	**1.39**
Level 1	KITCHEN 2 (10)	9.45	100	0.95	**1.36**
Level 1	KITCHEN 3	10.2	100	1.02	**1.47**
Level 1	KITCHEN 4 (10)	10.49	100	1.05	**1.51**
Level 1	KITCHEN 5 (10)	8.08	100	0.81	**1.17**
Level 2	LARGE MEETING ROOM	20.32	85	1.73	**2.49**
Ground Floor	LAUNDRY	9.85	85	0.84	**1.21**
Level 1	LAUNDRY	2.61	85	0.22	**0.32**
Level 1	LAUNDRY (3)	2.83	85	0.24	**0.35**
Level 1	LAUNDRY (3)	2.53	85	0.22	**0.31**
Ground Floor	LAUNDRY (6)	6.43	85	0.55	**0.79**
Level 1	LAUNDRY 1	3.19	85	0.27	**0.39**
Level 1	LAUNDRY 3 (3)	2.91	85	0.25	**0.36**
Level 1	LAUNDRY 4 (3)	2.62	85	0.22	**0.32**
Level 1	LAUNDRY 5	2.71	85	0.23	**0.33**
Level 1	LIBRARY / COMPUTER (12)	8.79	85	0.75	**1.08**
Ground Floor	LIFT 01	10.71	100	1.07	**1.55**
Level 1	LIFT 01	10.71	0	0.00	**0.00**
Level 2	LIFT 01	10.71	0	0.00	**0.00**
Ground Floor	LIFT 02	10.71	100	1.07	**1.55**
Level 1	LIFT 02	10.71	0	0.00	**0.00**
Level 2	LIFT 02	10.71	0	0.00	**0.00**
Level 1	LIFT LOBBY	40.59	20	0.81	**1.17**
Level 1	LINEN	1.5	20	0.03	**0.04**

Electrical Maximum Demand Calculation

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Level 1	LIVING / DINING (20)	19.77	85	1.68	**2.43**
Level 1	LIVING / DINING (18)	17.74	85	1.51	**2.18**
Level 1	LIVING / DINING (18)	17.55	85	1.49	**2.15**
Level 1	LIVING / DINING 1 (20)	19.7	85	1.67	**2.42**
Level 1	LIVING / DINING 3	19.56	85	1.66	**2.40**
Level 1	LIVING / DINING 4 (20)	19.56	85	1.66	**2.40**
Level 1	LIVING / DINING 5 (20)	5.17	85	0.44	**0.63**
Level 2	LOCKERS	3	20	0.06	**0.09**
Ground Floor	LOUNGE GENERAL (25)	24.14	85	2.05	**2.96**
Ground Floor	LOUNGE GENERAL (25)	24.51	85	2.08	**3.01**
Ground Floor	LOUNGE SMALL (15)	16.32	85	1.39	**2.00**
Ground Floor	LOUNGE SMALL (16)	15.48	85	1.32	**1.90**
Level 1	LOW SECURE ACC BEDROOM (18)	17.09	85	1.45	**2.10**
Level 1	LOW SECURE ACC BEDROOM (18)	17.77	85	1.51	**2.18**
Level 1	LOW SECURE BEDROOM (18)	18.5	85	1.57	**2.27**
Level 1	LOW SECURE BEDROOM (18)	18.5	85	1.57	**2.27**
Level 1	LOW SECURE BEDROOM 1	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 1	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 1	15.67	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 1	15.59	85	1.33	**1.91**
Level 1	LOW SECURE BEDROOM 2	15.66	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 2	15.58	85	1.32	**1.91**
Level 1	LOW SECURE BEDROOM 2	15.58	85	1.32	**1.91**
Level 1	LOW SECURE BEDROOM 2	15.58	85	1.32	**1.91**
Level 1	LOW SECURE BEDROOM 3	15.84	85	1.35	**1.94**
Level 1	LOW SECURE BEDROOM 3	15.84	85	1.35	**1.94**
Level 1	LOW SECURE BEDROOM 3	15.78	85	1.34	**1.94**
Level 1	LOW SECURE BEDROOM 3	15.81	85	1.34	**1.94**
Level 1	LOW SECURE BEDROOM 4	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 4	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 4	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 4	15.64	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 5	16.06	85	1.37	**1.97**
Level 1	LOW SECURE BEDROOM 5	15.91	85	1.35	**1.95**
Level 1	LOW SECURE BEDROOM 5	15.91	85	1.35	**1.95**
Level 1	LOW SECURE BEDROOM 5	15.91	85	1.35	**1.95**
Level 2	MAIN SWITCH/UPS ROOM	20.01	85	1.70	**2.45**
Level 1	MECH	3.23	0	0.00	**0.00**
Level 1	MECH	5.08	0	0.00	**0.00**
Ground Floor	MECH.	3.62	0	0.00	**0.00**
Ground Floor	MECH. RISER	3.88	0	0.00	**0.00**
Ground Floor	MECH. RISER	4.92	0	0.00	**0.00**
Ground Floor	MECH. RISER	2.92	0	0.00	**0.00**
Ground Floor	MECH. RISER	4.01	0	0.00	**0.00**
Level 1	MECH. RISER	4.92	0	0.00	**0.00**
Level 1	MECH. RISER	4.92	0	0.00	**0.00**
Level 1	MECH. RISER	1.77	0	0.00	**0.00**
Level 1	MECH. RISER	4.01	0	0.00	**0.00**
Ground Floor	MEDICATION CLEAN UTILITY (16)	15.84	85	1.35	**1.94**
Ground Floor	MEDICATION CLEAN UTILITY (16)	15.84	85	1.35	**1.94**
Ground Floor	MEDIUM SECURE BEDROOM 1 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 10 (16)	15.6	85	1.33	**1.91**
Ground Floor	MEDIUM SECURE BEDROOM 11 (16)	15.65	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 12 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 13 (16)	15.64	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 14 (16)	15.63	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 15 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 16 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 17 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 18 (16)	15.63	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 2 (16)	15.68	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 3 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 4 (16)	15.65	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 5 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 6 (16)	15.68	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 7 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 8 (16)	15.65	85	1.33	**1.92**
Level 2	MEETING ROOM	10.05	85	0.85	**1.23**
Level 1	MEETING ROOM (30)	30.11	85	2.56	**3.69**
Ground Floor	MULTIFUNCTION GROUP ROOM (20)	20.46	85	1.74	**2.51**
Ground Floor	MULTIFUNCTION GROUP ROOM (20)	20.37	85	1.73	**2.50**
Ground Floor	OBSERVATION BAY (4)	3.51	85	0.30	**0.43**
Level 2	OFFICE	8.65	85	0.74	**1.06**

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Electrical Maximum Demand Calculation

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Level 2	OFFICE	8.6	85	0.73	**1.06**
Level 2	OFFICE	8.96	85	0.76	**1.10**
Ground Floor	OFFICE (9)	10.62	85	0.90	**1.30**
Level 1	OFFICE (9)	9.62	85	0.82	**1.18**
Level 2	OFFICE EQUIP BAY	2.94	85	0.25	**0.36**
Level 1	OFFICE EQUIPMENT (4)	5.27	85	0.45	**0.65**
Ground Floor	OFFICE EQUIPMENT BAY (4)	3.53	85	0.30	**0.43**
Level 2	OPEN COLLAB SPACE	8.48	85	0.72	**1.04**
Level 1	OT KITCHEN (12)	7.6	85	0.65	**0.93**
Ground Floor	OUTDOOR	310.84	5	1.55	**2.24**
Ground Floor	OUTDOOR	169.23	5	0.85	**1.22**
Ground Floor	PATIENT PROPERTY (8)	7.89	20	0.16	**0.23**
Level 1	PATIENT PROPERTY (8)	8.28	20	0.17	**0.24**
Level 2	PHONE BOOTH	3.41	85	0.29	**0.42**
Level 2	PLANTROOM	250.54	85	21.30	**30.74**
Ground Floor	PROPERTY BAY	1.71	20	0.03	**0.05**
Level 1	QUIET / TV 2 (12)	11.43	85	0.97	**1.40**
Level 1	QUIET / TV 1 (12)	9.91	85	0.84	**1.22**
Level 1	QUIET ROOM 5	7.26	85	0.62	**0.89**
Level 1	QUIET SPACE 4	12.38	85	1.05	**1.52**
Level 1	QUITE SPACE 3	12.29	85	1.04	**1.51**
Ground Floor	RECEPTION (10)	10.03	85	0.85	**1.23**
Ground Floor	RISER	1.14	0	0.00	**0.00**
Level 1	RISER	1.14	0	0.00	**0.00**
Ground Floor	SECLUSION ENSUITE (5)	4.69	20	0.09	**0.14**
Ground Floor	SECLUSION OBSERVE (10)	9.54	20	0.19	**0.28**
Ground Floor	SECLUSION ROOM (14)	14.89	85	1.27	**1.83**
Ground Floor	SECURE ENTRY (54)	54.17	85	4.60	**6.65**
Ground Floor	SENSORY MODULATION (12)	11.58	85	0.98	**1.42**
Ground Floor	SERVERY (25)	24.52	200	4.90	**7.08**
Level 2	SHR	4.35	20	0.09	**0.13**
Ground Floor	STAFF INTERFACE (14)	14.11	85	1.20	**1.73**
Level 1	STAFF LOCKER (3)	2.37	20	0.05	**0.07**
Ground Floor	STAFF LOCKER (4)	2.08	20	0.04	**0.06**
Level 1	STAFF STATION (8)	8.45	85	0.72	**1.04**
Ground Floor	STAFF WC (3)	3.85	20	0.08	**0.11**
Level 1	STAFF WC (3)	3.47	20	0.07	**0.10**
Level 1	STAIR	22.11	20	0.44	**0.64**
Level 1	STAIR	21.08	20	0.42	**0.61**
Level 2	STAIR	24.32	20	0.49	**0.70**
Level 2	STAIR	22.11	20	0.44	**0.64**
Ground Floor	STAIR 1	21.08	20	0.42	**0.61**
Level 1	STAIR 2	22.11	20	0.44	**0.64**
Ground Floor	STAIR 3	22.11	20	0.44	**0.64**
Ground Floor	STAIR PRESS	4.92	20	0.10	**0.14**
Ground Floor	STORE	5.6	20	0.11	**0.16**
Level 1	STORE	7.28	20	0.15	**0.21**
Ground Floor	STORE (20)	16.53	20	0.33	**0.48**
Level 1	STORE (8)	7.54	20	0.15	**0.22**
Ground Floor	STORE GENERAL/CLEAN UTILITY (12)	12.51	85	1.06	**1.53**
Level 2	TEA ROOM	20.21	85	1.72	**2.48**
Ground Floor	TRIBUNAL (30)	29.49	85	2.51	**3.62**
Level 1	UNIT 1 - LOW SECURE	47.26	85	4.02	**5.80**
Level 1	UNIT 2 - LOW SECURE	43.66	85	3.71	**5.36**
Level 1	UNIT 3 - LOW SECURE	63.62	85	5.41	**7.81**
Level 1	UNIT 4 - LOW SECURE	63.75	85	5.42	**7.82**
Level 1	UNIT 5 - LOW SECURE	83.38	85	7.09	**10.23**
Level 1	UNIT 6 & 7 - LOW SECURE	46.54	85	3.96	**5.71**
Ground Floor	VISITS ROOM (18)	17.64	85	1.50	**2.16**
Ground Floor	WAITING (15)	14.28	85	1.21	**1.75**
Ground Floor	WC	3.18	20	0.06	**0.09**
Level 2	WC	4.41	20	0.09	**0.13**
Level 2	WC	4.22	20	0.08	**0.12**
Ground Floor	WC (4)	3.75	20	0.08	**0.11**
Total		**4629.54**	**55.23809524**	**262.06**	**378.25**

Appendix E – Ausgrid Design Services Offer

OFFER to provide DESIGN RELATED SERVICES

DESIGN RELATED SERVICES OFFER

Premises address: **HOSPITAL ROAD, CONCORD WEST 2138**

NMI - Number: **Webform Ref 382841**

MC Reference: **1900117202** **AP Reference: 800520085**

This offer is made on 20/10/2022

By *Ausgrid* of 24 Campbell St, Haymarket NSW 2000.

To the ***connection applicant*** named in the *connection application* received on 11/10/2022 in respect of the *premises* referred to above.

Ausgrid has determined that network alterations are required to connect your development and we cannot proceed to a connection or relocation offer at this stage. To enable Ausgrid to further consider and process your application you will require a certified design and associated certification number. Your application remains technically incomplete until you have been issued a certification number.

This Design Related Services Offer provides guidance on how to obtain a certified design and associated certification number.

Scope of Network Alterations

Ausgrid has determined that the following works are likely to be required:

- Relocate HV & LV cables between S.35340 and S.35341
- At S.35340 upgrade Tx to 1000kVA & LV board to 1600/400/400.
- Consolidate existing supply from S.35340 with new supply.
- Establish Access in compliance with Ausgrids standards to S.35340.

These works are classified as contestable, which means that you are required to fund the design and some or all of the construction works. If you have not already done so, you will need to engage and manage suitably qualified contractors, known as Accredited Service Providers (ASPs) to undertake the design and construction.

Initially, your ASP Level 3 (ASP/3) will undertake the design, and then your ASP Level 1 (ASP/1) will undertake construction in accordance with the design and Ausgrid's policies and standards. The timeframe for the works will vary depending on factors such as the complexity and the way in which you manage your ASP's.

Once the works have been satisfactorily completed and electrified, the premises connection assets will be owned and maintained by Ausgrid as part of the electricity distribution network.

Contract for Design Related Services

This letter is an offer for the Customer to enter into a Contract for Design Related Services with Ausgrid. It remains open for acceptance for 45 business days. If the offer is accepted by the Applicant, the Applicant does so as the Customer's agent. No work will be undertaken by *Ausgrid* until a Design Contract is in place.

You are encouraged to contact ASP/3's and ASP/1's to understand the likely overall costs you will incur for design and construction before you accept and commit to the Contract for Design Related Services.

IMPORTANT: The contractual arrangements provide the framework for a design to be prepared by your ASP/3, and NOT by *Ausgrid*. *Ausgrid's* fees as outlined below are for the design related network services we provide during the design phase and are **IN ADDITION** to the fees charged by your ASP/3 in preparing the design.

Acceptance Fees

The acceptance fees relating to the Contract for Design Related Services are outlined in the attached Acceptance Fee Summary and also detailed on the Ausgrid Portal page. *Ausgrid* will invoice **the Customer** once we receive acceptance via the Ausgrid Portal along with a Customer Details Form (attached). The Contract will commence when you pay the invoiced fee.

The acceptance fees are an estimate for the *Ausgrid* services required and are payable up front by the **Customer**. Further fees may apply for any additional services required and these will be quoted via the Ausgrid Portal on each occasion.

Ausgrid's published rates for our services are amended from time to time in our Alternative Control Services Fee Schedule Publication, and in accordance with the Contract, *Ausgrid* reserves the right to charge the rates that are applicable at the time the service is provided.

Fees for *Ausgrid's* services are in addition to the design and construction costs charged by your ASP's, and some fees may not be refundable if the service has already been provided. Fees and rates are set by the Australian Energy Regulator.

WHAT TO DO NEXT

- To move ahead, please accept the offer (see below) outlined in this document and then have the **Customer** pay the invoice that will be forwarded
- **Complete and forward the Customer Details Form**
- Engage an ASP Level 3 designer
    - On the Ausgrid Portal, nominate the ASP/3 as the designer for this project
    - Advise the ASP/3 that the Design Information Category for this project is **Simple**

Enquiries: connections.technical.enquiries@ausgrid.com.au

Enclosures:

Contract terms – via website at:
https://ausgrid.com.au/CDRS.

Customer Details Form – via website at
https://ausgrid.com.au/customerdetailsform

Acceptance Fee Summary – attached

PLEASE REVIEW THE OFFER OUTLINED IN THIS LETTER, ALONG WITH THE TERMS LINKED ABOVE, THEN PROCEED TO THE AUSGRID PORTAL

IF YOU WISH TO ACCEPT THIS OFFER

SELECT "ACCEPT" AGAINST THE OFFER ON THE AUSGRID PORTAL WITHIN 45 BUSINESS DAYS

RETURN THE CUSTOMER DETAILS FORM BY EMAIL TO contestability@ausgrid.com.au

IF YOU WISH TO DECLINE THE OFFER

SELECT "DECLINE" AGAINST THE OFFER ON THE AUSGRID PORTAL.

Should you wish to proceed in the future, a new connection application will need to be lodged.

Appendix F – Design Development Drawings

Appendix G – Lightning Risk Assessment

AS 1768 Risk Assessment for Lightning Protection

Version 5.0 Date: 24/9/2021

Structure ***CONCORD FORENSIC MENTAL HEALTH***

Structure Dimensions

Length (m)	60
Width (m)	60
Height (m)	15

Structure Attributes

Susceptibility to Fire and Physical Damage	Low
Susceptibility to Electrical Sparking	Low
Internal Wiring Type	Unscreened

Service Lines

Power Line

Power Supply	Underground
Cable Type	Unscreened
Transformer at Structure	No Transformer

Other Overhead Services

Number	0
Cable Type	Unscreened

Other Underground Services

Number	1
Cable Type	Unscreened

Loss Categories

Category 1 - Loss of Human Life

Evacuation Difficulties	100	Location Type - FIRE	0.1	Location Type - OVERVOLTAGES	0.0001

Category 2 - Loss of Essential Services

Fire Damage Factor	0	Overvoltage Damage Factor	0

Category 3 - Loss of Cultural Heritage

Fire Damage Factor	0

Category 4 - Economic Loss

Fire Damage Factor	0.5	Tolerable Risk of Economic Losses	1.E-03
Overvoltage Damage Factor	5.E-03	Step & Touch Voltage Damage Factors (Animals)	0

Environment

Ground Flash Density	2
Environmental Factor	Similar Height
Service Line Density	CBD

Protection Measures

Efficiency of Direct Strike Protection	0.84	Surge Protection at Point of Entry	Yes
Fire Protection	Automated	Surge Protection on All Equipment	Yes

Lightning Strike Frequencies

Direct strikes to STRUCTURE per annum	0.010
Years between **direct** strikes to STRUCTURE	96.3
Indirect strikes to STRUCTURE per annum	0.48
Years between **indirect** strikes to STRUCTURE	2.1
Direct strikes to SERVICES per annum	0.000
Years between **direct** strikes to SERVICES	n/a
Indirect strikes to SERVICES per annum	0.00
Years between **indirect** strikes to SERVICES	n/a

Overall Risk

	Calculated Risk (R)	Tolerable Risk (Ra)	Direct Strike Risk (Rd)	Indirect Strike Risk (Ri)
Loss of Human Life	4.22E-06	1.0E-05	2.69E-06	1.53E-06
Loss of Essential Services	0.00E+00	1.0E-03	0.00E+00	0.00E+00
Loss of Cultural Heritage	0.00E+00	1.0E-03	0.00E+00	0.00E+00
Economic Loss	9.18E-07	1.0E-03	1.53E-07	7.65E-07

Appendix H – PV System Memo

Stantec

EL-ME-002

Enquiries: Allan Wong
Project No: 301351044

To: Ken Leung-Shing / Alex Badgery

From: Allan Wong

Date: 06/10/2023

Subject: Concord Forensic Mental Health Unit – PV System

Summary: *This memo provides a summary of the proposed Solar PV installation.*

1. Solar PV Generation

Refer to Appendix A for the proposed solar PV roof layout.

The table below provides an indicative summary of the maximum nominal power generated for the proposed installation area:

Area installed	Watts / PV Panel	Approx. Panel Qty	Nom Max Power STC(1) (kW)	Comments
Roof	600	260	156.00	Based on Canadian Solar Hiku7 600W Monocrystalline Panels (2172mm x 1303mm)

(1) Under Standard Test Conditions (STC), irradiance of 1000W/m2, spectrum AM 1.5 and cell temperature 25°C

2. Maximum Demand

The maximum demand of the new CFMH Building is approximately 378 Amps (262kVA / 248.9kW)

Refer to Appendix B for electrical maximum demand calculation.

3. Connection of load

Based on the proposed solar PV roof layout and utilising 600W PV Panels, the size of the solar PV system is approximately 156kW. Refer to Appendix C for PV panel data sheet.

The solar PV system is approximately 62% of the maximum demand of the new IMHC Building.

The new building will consume all energy generated by the system.

Therefore, there will likely be no requirement to export energy onto the Ausgrid network.

4. Order of Costs

The following table provides a high-level project cost estimate based on the proposed solar PV roof layout:

Area installed	Approx. Panel Qty	$/Panel	Subtotal	Comments
Roof [2]	260	650	$169,000	Based on Canadian Solar Hiku7 600W Monocrystalline Panels (2172mm x 1303mm)

[2] Unit prices are indicative only. Unit prices to be confirmed by QS or solar system provider.

4.1 Exclusions

- Metal Roof
- Site Preliminaries
- Demolition
- Staging costs
- Builder’s works
- Builder’s mark-up and GST
- Contractor's contingencies for risk, contractual obligations, site establishment
- Escalation to tender
- Connection of EV charging System to PV system
- Builder's electrical supply and preliminary costs
- Carpark equipment such as ticketing machines, gates, wayfinding, parking management systems

All these figures are preliminary only and are subject to change.

Appendix A – Proposed Solar PV Roof Layout

Appendix B – Electrical Max Demand Calculation

Electrical Maximum Demand Calculation

Project: Concord Forensic Mental Health
Project-No: 301351044
Revision: 7
Date: 2023-02-11

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Level 2	10NO. WORKPOINTS	34.2	85	2.91	**4.20**
Level 2	2 PERSON OFFICE	11.88	85	1.01	**1.46**
Level 2	25NO. WORKPOINTS	86.5	85	7.35	**10.61**
Level 2	ABW	31.74	85	2.70	**3.89**
Level 1	ACC ENSUITE (7)	6.7	20	0.13	**0.19**
Level 1	ACC ENSUITE (7)	6.51	20	0.13	**0.19**
Ground Floor	ACC ENSUITE 9 (7)	6.68	20	0.13	**0.19**
Ground Floor	ACC MEDIUM SECURE BEDROOM 9 (18)	18.45	20	0.37	**0.53**
Ground Floor	ACC WC	7.33	20	0.15	**0.21**
Level 2	ACC WC	6.79	20	0.14	**0.20**
Ground Floor	ACTIVITY / THERAPY (20)	18.65	85	1.59	**2.29**
Ground Floor	AIRLOCK (6)	6.68	20	0.13	**0.19**
Level 1	BALCONY GARDEN 1	114.25	5	0.57	**0.82**
Level 1	BALCONY GARDEN 2	53.3	5	0.27	**0.38**
Level 1	BEV BAY (3)	2.26	85	0.19	**0.28**
Ground Floor	BEVERAGE BAY (3)	4.25	85	0.36	**0.52**
Ground Floor	BULK STORES (20)	19.54	20	0.39	**0.56**
Ground Floor	CIRC	13.45	20	0.27	**0.39**
Ground Floor	CIRC	34.05	20	0.68	**0.98**
Ground Floor	CIRC	231.16	20	4.62	**6.67**
Ground Floor	CIRC	58.06	20	1.16	**1.68**
Ground Floor	CIRC	7.44	20	0.15	**0.21**
Ground Floor	CIRC	16.01	20	0.32	**0.46**
Ground Floor	CIRC	7.7	20	0.15	**0.22**
Level 1	CIRC	9.01	20	0.18	**0.26**
Level 1	CIRC	34.75	20	0.70	**1.00**
Level 1	CIRC	118.03	20	2.36	**3.41**
Level 2	CIRC	33.58	20	0.67	**0.97**
Level 2	CIRC	28.57	20	0.57	**0.82**
Ground Floor	CLEAN LINEN (2)	2.23	20	0.04	**0.06**
Ground Floor	CLEAN LINEN (2)	2.05	20	0.04	**0.06**
Level 1	CLEAN UTILITY (10)	9.67	85	0.82	**1.19**
Ground Floor	CLEANER (5)	4.5	20	0.09	**0.13**
Level 1	CLEANER (5)	4.83	20	0.10	**0.14**
Ground Floor	CLINICAL WORKROOM (17)	24.25	85	2.06	**2.98**
Level 1	CLINICAL WORKROOM (17)	18.18	85	1.55	**2.23**
Ground Floor	COMMS	13.52	200	2.70	**3.90**
Level 1	COMMS	13.52	200	2.70	**3.90**
Level 2	COMMS ROOM	10.8	200	2.16	**3.12**
Ground Floor	CONSULT (14)	14.22	85	1.21	**1.74**
Level 1	CONSULT (14)	14.4	85	1.22	**1.77**
Ground Floor	COURTYARD	25.18	5	0.13	**0.18**
Ground Floor	DE-ESCALATION ROOM (18)	18.28	85	1.55	**2.24**
Ground Floor	DINING ROOM (40)	39.57	85	3.36	**4.85**
Ground Floor	DIRTY LINEN	1.09	20	0.02	**0.03**
Ground Floor	DIRTY LINEN (.5)	0.79	20	0.02	**0.02**
Ground Floor	DIRTY LINEN (.5)	0.97	20	0.02	**0.03**
Ground Floor	DIRTY UTILITY (8)	7.91	85	0.67	**0.97**
Level 1	DISPOSAL (4)	5.1	20	0.10	**0.15**
Ground Floor	DISPOSAL ROOM (12)	11.84	20	0.24	**0.34**
Ground Floor	EDB	2.83	20	0.06	**0.08**
Ground Floor	EDB	2.36	20	0.05	**0.07**
Level 1	EDB	2.83	20	0.06	**0.08**
Level 1	EDB	1.07	20	0.02	**0.03**
Level 1	ENSUITE	5	20	0.10	**0.14**
Level 1	ENSUITE	5	20	0.10	**0.14**
Ground Floor	ENSUITE 1	4.82	20	0.10	**0.14**
Level 1	ENSUITE 1	4.81	20	0.10	**0.14**
Level 1	ENSUITE 1	4.81	20	0.10	**0.14**
Level 1	ENSUITE 1	4.8	20	0.10	**0.14**
Level 1	ENSUITE 1	4.76	20	0.10	**0.14**
Ground Floor	ENSUITE 10	4.77	20	0.10	**0.14**
Ground Floor	ENSUITE 11	4.81	20	0.10	**0.14**
Ground Floor	ENSUITE 12	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 13	4.75	20	0.10	**0.14**

Stantec

Electrical Maximum Demand Calculation

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Ground Floor	ENSUITE 14	4.81	20	0.10	**0.14**
Ground Floor	ENSUITE 15	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 16	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 17	4.83	20	0.10	**0.14**
Ground Floor	ENSUITE 18	4.78	20	0.10	**0.14**
Ground Floor	ENSUITE 2	4.84	20	0.10	**0.14**
Level 1	ENSUITE 2	4.84	20	0.10	**0.14**
Level 1	ENSUITE 2	4.84	20	0.10	**0.14**
Level 1	ENSUITE 2	4.79	20	0.10	**0.14**
Level 1	ENSUITE 2	4.79	20	0.10	**0.14**
Ground Floor	ENSUITE 3	4.82	20	0.10	**0.14**
Level 1	ENSUITE 3	4.6	20	0.09	**0.13**
Level 1	ENSUITE 3	4.64	20	0.09	**0.13**
Level 1	ENSUITE 3	4.64	20	0.09	**0.13**
Level 1	ENSUITE 3	4.59	20	0.09	**0.13**
Ground Floor	ENSUITE 4	4.81	20	0.10	**0.14**
Level 1	ENSUITE 4	4.82	20	0.10	**0.14**
Level 1	ENSUITE 4	4.82	20	0.10	**0.14**
Level 1	ENSUITE 4	4.82	20	0.10	**0.14**
Level 1	ENSUITE 4	4.75	20	0.10	**0.14**
Ground Floor	ENSUITE 5	4.82	20	0.10	**0.14**
Level 1	ENSUITE 5	4.85	20	0.10	**0.14**
Level 1	ENSUITE 5	4.85	20	0.10	**0.14**
Level 1	ENSUITE 5	4.8	20	0.10	**0.14**
Level 1	ENSUITE 5	5.06	20	0.10	**0.15**
Ground Floor	ENSUITE 6	4.84	20	0.10	**0.14**
Ground Floor	ENSUITE 7	4.82	20	0.10	**0.14**
Ground Floor	ENSUITE 8	4.81	20	0.10	**0.14**
Ground Floor	EXERCISE ROOM (22)	21.84	85	1.86	**2.68**
Level 1	FAMILY INTERVIEW (18)	19.18	85	1.63	**2.35**
Ground Floor	FAMILY INTERVIEW ROOM (18)	17.08	85	1.45	**2.10**
Ground Floor	FIRE	2.74	20	0.05	**0.08**
Ground Floor	FIRE	2.63	20	0.05	**0.08**
Level 2	FOCUS ROOM 1	6.28	85	0.53	**0.77**
Level 2	FOCUS ROOM 2	6.3	85	0.54	**0.77**
Level 2	FOCUS ROOM 3	6.48	85	0.55	**0.80**
Level 1	GROUP THERAPY (30)	12.38	85	1.05	**1.52**
Ground Floor	HANDWASHING BAY	1.84	20	0.04	**0.05**
Ground Floor	HWB	0.78	20	0.02	**0.02**
Ground Floor	HWB	0.91	20	0.02	**0.03**
Ground Floor	INTERVIEW (14)	13.69	85	1.16	**1.68**
Ground Floor	INTERVIEW (14)	14.57	85	1.24	**1.79**
Ground Floor	INTERVIEW (14)	13.46	85	1.14	**1.65**
Level 1	INTERVIEW ROOM - MH (14)	16.75	85	1.42	**2.06**
Ground Floor	IT RESOURCE (20)	19.84	85	1.69	**2.43**
Level 1	KITCHEN (10)	9.57	100	0.96	**1.38**
Level 1	KITCHEN (10)	9.53	100	0.95	**1.38**
Ground Floor	KITCHEN (24)	24.29	100	2.43	**3.51**
Level 1	KITCHEN 1 (10)	9.64	100	0.96	**1.39**
Level 1	KITCHEN 2 (10)	9.45	100	0.95	**1.36**
Level 1	KITCHEN 3	10.2	100	1.02	**1.47**
Level 1	KITCHEN 4 (10)	10.49	100	1.05	**1.51**
Level 1	KITCHEN 5 (10)	8.08	100	0.81	**1.17**
Level 2	LARGE MEETING ROOM	20.32	85	1.73	**2.49**
Ground Floor	LAUNDRY	9.85	85	0.84	**1.21**
Level 1	LAUNDRY	2.61	85	0.22	**0.32**
Level 1	LAUNDRY (3)	2.83	85	0.24	**0.35**
Level 1	LAUNDRY (3)	2.53	85	0.22	**0.31**
Ground Floor	LAUNDRY (6)	6.43	85	0.55	**0.79**
Level 1	LAUNDRY 1	3.19	85	0.27	**0.39**
Level 1	LAUNDRY 3 (3)	2.91	85	0.25	**0.36**
Level 1	LAUNDRY 4 (3)	2.62	85	0.22	**0.32**
Level 1	LAUNDRY 5	2.71	85	0.23	**0.33**
Level 1	LIBRARY / COMPUTER (12)	8.79	85	0.75	**1.08**
Ground Floor	LIFT 01	10.71	100	1.07	**1.55**
Level 1	LIFT 01	10.71	0	0.00	**0.00**
Level 2	LIFT 01	10.71	0	0.00	**0.00**
Ground Floor	LIFT 02	10.71	100	1.07	**1.55**
Level 1	LIFT 02	10.71	0	0.00	**0.00**
Level 2	LIFT 02	10.71	0	0.00	**0.00**
Level 1	LIFT LOBBY	40.59	20	0.81	**1.17**
Level 1	LINEN	1.5	20	0.03	**0.04**

Electrical Maximum Demand Calculation

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Level 1	LIVING / DINING (20)	19.77	85	1.68	**2.43**
Level 1	LIVING / DINING (18)	17.74	85	1.51	**2.18**
Level 1	LIVING / DINING (18)	17.55	85	1.49	**2.15**
Level 1	LIVING / DINING 1 (20)	19.7	85	1.67	**2.42**
Level 1	LIVING / DINING 3	19.56	85	1.66	**2.40**
Level 1	LIVING / DINING 4 (20)	19.56	85	1.66	**2.40**
Level 1	LIVING / DINING 5 (20)	5.17	85	0.44	**0.63**
Level 2	LOCKERS	3	20	0.06	**0.09**
Ground Floor	LOUNGE GENERAL (25)	24.14	85	2.05	**2.96**
Ground Floor	LOUNGE GENERAL (25)	24.51	85	2.08	**3.01**
Ground Floor	LOUNGE SMALL (15)	16.32	85	1.39	**2.00**
Ground Floor	LOUNGE SMALL (16)	15.48	85	1.32	**1.90**
Level 1	LOW SECURE ACC BEDROOM (18)	17.09	85	1.45	**2.10**
Level 1	LOW SECURE ACC BEDROOM (18)	17.77	85	1.51	**2.18**
Level 1	LOW SECURE BEDROOM (18)	18.5	85	1.57	**2.27**
Level 1	LOW SECURE BEDROOM (18)	18.5	85	1.57	**2.27**
Level 1	LOW SECURE BEDROOM 1	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 1	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 1	15.67	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 1	15.59	85	1.33	**1.91**
Level 1	LOW SECURE BEDROOM 2	15.66	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 2	15.58	85	1.32	**1.91**
Level 1	LOW SECURE BEDROOM 2	15.58	85	1.32	**1.91**
Level 1	LOW SECURE BEDROOM 2	15.58	85	1.32	**1.91**
Level 1	LOW SECURE BEDROOM 3	15.84	85	1.35	**1.94**
Level 1	LOW SECURE BEDROOM 3	15.84	85	1.35	**1.94**
Level 1	LOW SECURE BEDROOM 3	15.78	85	1.34	**1.94**
Level 1	LOW SECURE BEDROOM 3	15.81	85	1.34	**1.94**
Level 1	LOW SECURE BEDROOM 4	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 4	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 4	15.68	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 4	15.64	85	1.33	**1.92**
Level 1	LOW SECURE BEDROOM 5	16.06	85	1.37	**1.97**
Level 1	LOW SECURE BEDROOM 5	15.91	85	1.35	**1.95**
Level 1	LOW SECURE BEDROOM 5	15.91	85	1.35	**1.95**
Level 1	LOW SECURE BEDROOM 5	15.91	85	1.35	**1.95**
Level 2	MAIN SWITCH/UPS ROOM	20.01	85	1.70	**2.45**
Level 1	MECH	3.23	0	0.00	**0.00**
Level 1	MECH	5.08	0	0.00	**0.00**
Ground Floor	MECH.	3.62	0	0.00	**0.00**
Ground Floor	MECH. RISER	3.88	0	0.00	**0.00**
Ground Floor	MECH. RISER	4.92	0	0.00	**0.00**
Ground Floor	MECH. RISER	2.92	0	0.00	**0.00**
Ground Floor	MECH. RISER	4.01	0	0.00	**0.00**
Level 1	MECH. RISER	4.92	0	0.00	**0.00**
Level 1	MECH. RISER	4.92	0	0.00	**0.00**
Level 1	MECH. RISER	1.77	0	0.00	**0.00**
Level 1	MECH. RISER	4.01	0	0.00	**0.00**
Ground Floor	MEDICATION CLEAN UTILITY (16)	15.84	85	1.35	**1.94**
Ground Floor	MEDICATION CLEAN UTILITY (16)	15.84	85	1.35	**1.94**
Ground Floor	MEDIUM SECURE BEDROOM 1 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 10 (16)	15.6	85	1.33	**1.91**
Ground Floor	MEDIUM SECURE BEDROOM 11 (16)	15.65	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 12 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 13 (16)	15.64	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 14 (16)	15.63	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 15 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 16 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 17 (16)	15.67	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 18 (16)	15.63	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 2 (16)	15.68	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 3 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 4 (16)	15.65	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 5 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 6 (16)	15.68	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 7 (16)	15.66	85	1.33	**1.92**
Ground Floor	MEDIUM SECURE BEDROOM 8 (16)	15.65	85	1.33	**1.92**
Level 2	MEETING ROOM	10.05	85	0.85	**1.23**
Level 1	MEETING ROOM (30)	30.11	85	2.56	**3.69**
Ground Floor	MULTIFUNCTION GROUP ROOM (20)	20.46	85	1.74	**2.51**
Ground Floor	MULTIFUNCTION GROUP ROOM (20)	20.37	85	1.73	**2.50**
Ground Floor	OBSERVATION BAY (4)	3.51	85	0.30	**0.43**
Level 2	OFFICE	8.65	85	0.74	**1.06**

Electrical Maximum Demand Calculation

Level	Description	Floor area of the space (m²)	Energy Demand (VA/m2)	Total Energy Demand (kVA)	Total Amps
Level 2	OFFICE	8.6	85	0.73	**1.06**
Level 2	OFFICE	8.96	85	0.76	**1.10**
Ground Floor	OFFICE (9)	10.62	85	0.90	**1.30**
Level 1	OFFICE (9)	9.62	85	0.82	**1.18**
Level 2	OFFICE EQUIP BAY	2.94	85	0.25	**0.36**
Level 1	OFFICE EQUIPMENT (4)	5.27	85	0.45	**0.65**
Ground Floor	OFFICE EQUIPMENT BAY (4)	3.53	85	0.30	**0.43**
Level 2	OPEN COLLAB SPACE	8.48	85	0.72	**1.04**
Level 1	OT KITCHEN (12)	7.6	85	0.65	**0.93**
Ground Floor	OUTDOOR	310.84	5	1.55	**2.24**
Ground Floor	OUTDOOR	169.23	5	0.85	**1.22**
Ground Floor	PATIENT PROPERTY (8)	7.89	20	0.16	**0.23**
Level 1	PATIENT PROPERTY (8)	8.28	20	0.17	**0.24**
Level 2	PHONE BOOTH	3.41	85	0.29	**0.42**
Level 2	PLANTROOM	250.54	85	21.30	**30.74**
Ground Floor	PROPERTY BAY	1.71	20	0.03	**0.05**
Level 1	QUIET / TV 2 (12)	11.43	85	0.97	**1.40**
Level 1	QUIET / TV 1 (12)	9.91	85	0.84	**1.22**
Level 1	QUIET ROOM 5	7.26	85	0.62	**0.89**
Level 1	QUIET SPACE 4	12.38	85	1.05	**1.52**
Level 1	QUITE SPACE 3	12.29	85	1.04	**1.51**
Ground Floor	RECEPTION (10)	10.03	85	0.85	**1.23**
Ground Floor	RISER	1.14	0	0.00	**0.00**
Level 1	RISER	1.14	0	0.00	**0.00**
Ground Floor	SECLUSION ENSUITE (5)	4.69	20	0.09	**0.14**
Ground Floor	SECLUSION OBSERVE (10)	9.54	20	0.19	**0.28**
Ground Floor	SECLUSION ROOM (14)	14.89	85	1.27	**1.83**
Ground Floor	SECURE ENTRY (54)	54.17	85	4.60	**6.65**
Ground Floor	SENSORY MODULATION (12)	11.58	85	0.98	**1.42**
Ground Floor	SERVERY (25)	24.52	200	4.90	**7.08**
Level 2	SHR	4.35	20	0.09	**0.13**
Ground Floor	STAFF INTERFACE (14)	14.11	85	1.20	**1.73**
Level 1	STAFF LOCKER (3)	2.37	20	0.05	**0.07**
Ground Floor	STAFF LOCKER (4)	2.08	20	0.04	**0.06**
Level 1	STAFF STATION (8)	8.45	85	0.72	**1.04**
Ground Floor	STAFF WC (3)	3.85	20	0.08	**0.11**
Level 1	STAFF WC (3)	3.47	20	0.07	**0.10**
Level 1	STAIR	22.11	20	0.44	**0.64**
Level 1	STAIR	21.08	20	0.42	**0.61**
Level 2	STAIR	24.32	20	0.49	**0.70**
Level 2	STAIR	22.11	20	0.44	**0.64**
Ground Floor	STAIR 1	21.08	20	0.42	**0.61**
Level 1	STAIR 2	22.11	20	0.44	**0.64**
Ground Floor	STAIR 3	22.11	20	0.44	**0.64**
Ground Floor	STAIR PRESS	4.92	20	0.10	**0.14**
Ground Floor	STORE	5.6	20	0.11	**0.16**
Level 1	STORE	7.28	20	0.15	**0.21**
Ground Floor	STORE (20)	16.53	20	0.33	**0.48**
Level 1	STORE (8)	7.54	20	0.15	**0.22**
Ground Floor	STORE GENERAL/CLEAN UTILITY (12)	12.51	85	1.06	**1.53**
Level 2	TEA ROOM	20.21	85	1.72	**2.48**
Ground Floor	TRIBUNAL (30)	29.49	85	2.51	**3.62**
Level 1	UNIT 1 - LOW SECURE	47.26	85	4.02	**5.80**
Level 1	UNIT 2 - LOW SECURE	43.66	85	3.71	**5.36**
Level 1	UNIT 3 - LOW SECURE	63.62	85	5.41	**7.81**
Level 1	UNIT 4 - LOW SECURE	63.75	85	5.42	**7.82**
Level 1	UNIT 5 - LOW SECURE	83.38	85	7.09	**10.23**
Level 1	UNIT 6 & 7 - LOW SECURE	46.54	85	3.96	**5.71**
Ground Floor	VISITS ROOM (18)	17.64	85	1.50	**2.16**
Ground Floor	WAITING (15)	14.28	85	1.21	**1.75**
Ground Floor	WC	3.18	20	0.06	**0.09**
Level 2	WC	4.41	20	0.09	**0.13**
Level 2	WC	4.22	20	0.08	**0.12**
Ground Floor	WC (4)	3.75	20	0.08	**0.11**
Total		**4629.54**	**55.24**	**262.06**	**378.25**

Appendix C – PV Panel Data Sheet

NEW

CanadianSolar

HiKu7 Mono PERC

580 W ~ 610 W

CS7L-580|585|590|595|600|605|610MS-R

MORE POWER

610 W — Module power up to 610 W
Module efficiency up to 21.6 %

$ — Up to 3.5 % lower LCOE
Up to 5.7 % lower system cost

Comprehensive LID / LeTID mitigation technology, up to 50% lower degradation

Better shading tolerance

MORE RELIABLE

40 °C lower hot spot temperature, greatly reduce module failure rate

Minimizes micro-crack impacts

*** — Heavy snow load up to 5400 Pa, wind load up to 2400 Pa*

12 Years — **Enhanced Product Warranty on Materials and Workmanship***

25 Years — **Linear Power Performance Warranty***

1st year power degradation no more than 2%
Subsequent annual power degradation no more than 0.55%

*According to the applicable Canadian Solar Limited Warranty Statement.

MANAGEMENT SYSTEM CERTIFICATES*

ISO 9001:2015 / Quality management system
ISO 14001:2015 / Standards for environmental management system
ISO 45001: 2018 / International standards for occupational health & safety

PRODUCT CERTIFICATES*

IEC 61215 / IEC 61730 / CE / INMETRO / MCS / UKCA
CEC listed (US California) / UL 61730
IEC 63126 Level 1 / IEC 61701 / IEC 62716 / IEC 60068-2-68
UNI 9177 Reaction to Fire: Class 1 / Take-e-way

* The specific certificates applicable to different module types and markets will vary, and therefore not all of the certifications listed herein will simultaneously apply to the products you order or use. Please contact your local Canadian Solar sales representative to confirm the specific certificates available for your Product and applicable in the regions in which the products will be used.

CSI Solar Co., Ltd. is committed to providing high quality solar photovoltaic modules, solar energy and battery storage solutions to customers. The company was recognized as the No. 1 module supplier for quality and performance/price ratio in the IHS Module Customer Insight Survey. Over the past 20 years, it has successfully delivered over 70 GW of premium-quality solar modules across the world.

* For detailed information, please refer to the Installation Manual.

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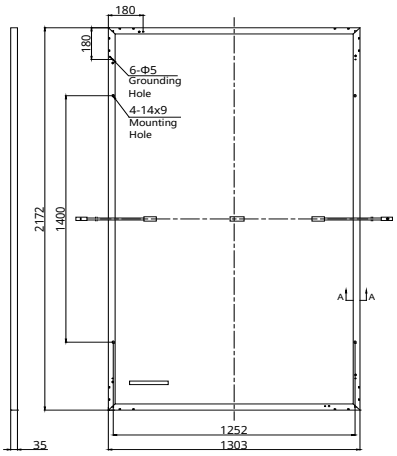
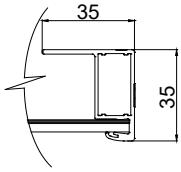
ENGINEERING DRAWING (mm)

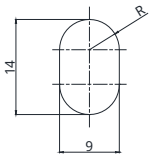
Rear View



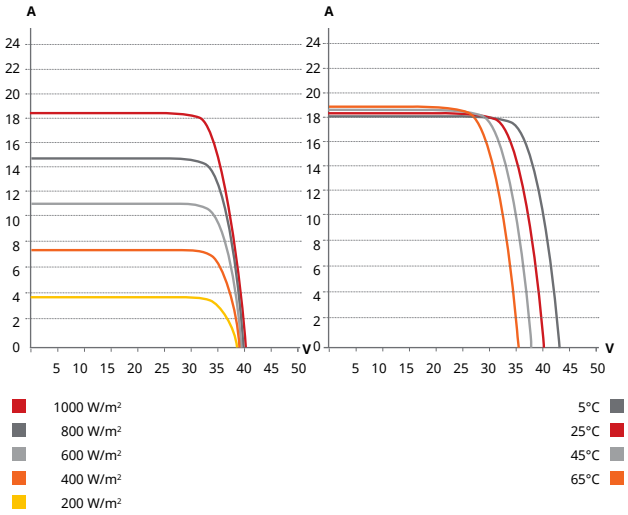
Frame Cross Section A-A



Mounting Hole



CS7L-590MS-R / I-V CURVES



ELECTRICAL DATA | STC*

CS7L-580/585/590/595/600/605/610MS-R

Nominal Max. Power (Pmax)	580 W	585 W	590 W	595 W	600 W	605 W	610 W
Opt. Operating Voltage (Vmp)	34.1 V	34.3 V	34.5 V	34.7 V	34.9 V	35.1 V	35.3 V
Opt. Operating Current (Imp)	17.02 A	17.06 A	17.11 A	17.15 A	17.20 A	17.25 A	17.29 A
Open Circuit Voltage (Voc)	40.5 V	40.7 V	40.9 V	41.1 V	41.3 V	41.5 V	41.7 V
Short Circuit Current (Isc)	18.27 A	18.32 A	18.37 A	18.42 A	18.47 A	18.52 A	18.57 A
Module Efficiency	20.5%	20.7%	20.8%	21.0%	21.2%	21.4%	21.6%
Operating Temperature	-40°C ~ +85°C						
Max. System Voltage	1500V (IEC/UL) or 1000V (IEC/UL)						
Module Fire Performance	TYPE 1 (UL 61730 1500V) or TYPE 2 (UL 61730 1000V) or CLASS C (IEC 61730)						
Max. Series Fuse Rating	30 A						
Application Classification	Class A						
Power Tolerance	0 ~ + 10 W						

* Under Standard Test Conditions (STC) of irradiance of 1000 W/m², spectrum AM 1.5 and cell temperature of 25°C.

MECHANICAL DATA

Specification	Data
Cell Type	Mono-crystalline
Cell Arrangement	120 [2 x (10 x 6)]
Dimensions	2172 × 1303 × 35 mm (85.5 × 51.3 × 1.38 in)
Weight	31.0 kg (68.3 lbs)
Front Cover	3.2 mm tempered glass with anti-reflective coating
Frame	Anodized aluminium alloy
J-Box	IP68, 3 bypass diodes
Cable	6.0 mm² (IEC), 10 AWG (UL)
Connector	T6 or T4 series or MC4-EVO2
Cable Length (Including Connector)	460 mm (18.1 in) (+) / 340 mm (13.4 in) (-) or customized length*
Per Pallet	31 pieces
Per Container (40' HQ)	527 pieces

* For detailed information, please contact your local Canadian Solar sales and technical representatives.

ELECTRICAL DATA | NMOT*

CS7L-580/585/590/595/600/605/610MS-R

Nominal Max. Power (Pmax)	435 W	439 W	442 W	446 W	450 W	454 W	457 W
Opt. Operating Voltage (Vmp)	32.0 V	32.2 V	32.3 V	32.5 V	32.7 V	32.9 V	33.1 V
Opt. Operating Current (Imp)	13.60 A	13.64 A	13.70 A	13.73 A	13.77 A	13.80 A	13.83 A
Open Circuit Voltage (Voc)	38.3 V	38.5 V	38.7 V	38.8 V	39.0 V	39.2 V	39.4 V
Short Circuit Current (Isc)	14.73 A	14.77 A	14.80 A	14.85 A	14.89 A	14.93 A	14.97 A

* Under Nominal Module Operating Temperature (NMOT), irradiance of 800 W/m², spectrum AM 1.5, ambient temperature 20°C, wind speed 1 m/s.

TEMPERATURE CHARACTERISTICS

Specification	Data
Temperature Coefficient (Pmax)	-0.34 % / °C
Temperature Coefficient (Voc)	-0.26 % / °C
Temperature Coefficient (Isc)	0.05 % / °C
Nominal Module Operating Temperature	41 ± 3°C

PARTNER SECTION

* The specifications and key features contained in this datasheet may deviate slightly from our actual products due to the on-going innovation and product enhancement. CSI Solar Co., Ltd. reserves the right to make necessary adjustment to the information described herein at any time without further notice.
Please be kindly advised that PV modules should be handled and installed by qualified people who have professional skills and please carefully read the safety and installation instructions before using our PV modules.

CSI Solar Co., Ltd.
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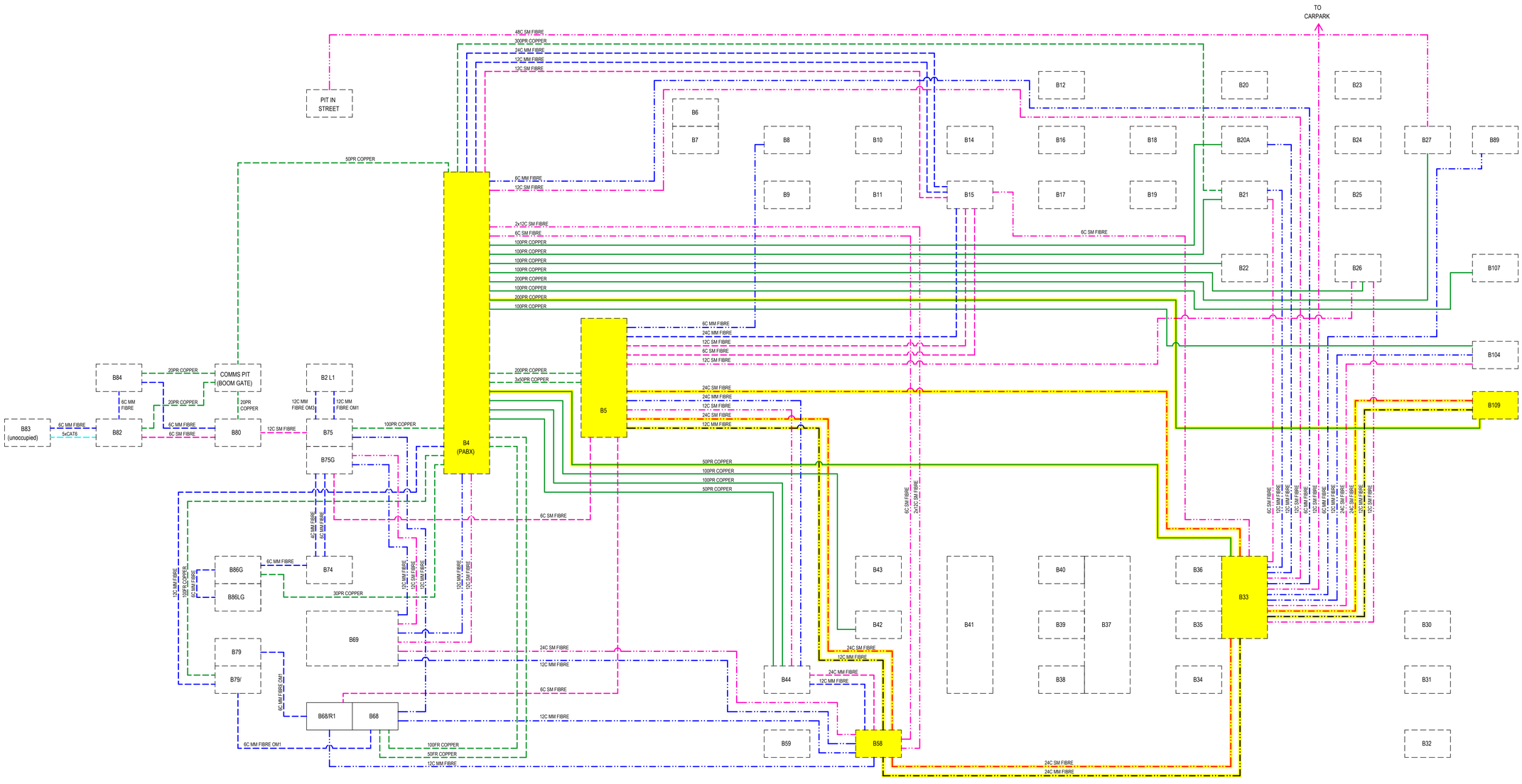
Appendix I – Existing Concord Campus Communications Single Line Diagram

LEGEND

- NEW SM FIBRE CABLES
- EXISTING SM FIBRE CABLES
- NEW MM FIBRE CABLES
- EXISTING MM FIBRE CABLES
- NEW CAT6 CABLES
- EXISTING CAT6 CABLES
- NEW COPPER CABLES
- EXISTING COPPER CABLES
- DASHED LINE DENOTES EXISTING



REV	DESCRIPTION	DRAWN	APP'D	DATE
B	AS BUILT	JW	RG	11.06.19
A	FOR CONSTRUCTION	JW	RG	01.04.19
01	PRELIMINARY	JW	RG	14.03.19

ELECTRICAL CONTRACTOR

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FAX 9898 0200
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CONSULTANT

WOOD & GRIEVE ENGINEERS

PROJECT

CONCORD HOSPITAL
REDEVELOPMENT STAGE 1
HOSPITAL RD, CONCORD NSW 2139

TITLE

COMMUNICATIONS
SINGLE LINE DIAGRAM

AS BUILT

ELECTRICAL SERVICE

SCALE @ B1	PROJECT No	DRAWING No	REV
NTS	404847	ENA-ELC-DG-1840	B