NSW Health Infrastructure

Cowra Hospital Redevelopment

Services Review of Environmental Factors (REF) Report

Issue 1 | 16 Dec 2022

Job number 285207

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ARUP

Document Verification

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Contents

Appendices

1 Introduction

1.1 Purpose of Report

This report has been prepared by Arup for the proposed Cowra Hospital Development Works. The purpose of this Review of Environment Factors report is to:

- Summarise the overall design intent for the following services:
    - Electrical, ICT & Security
    - Mechanical & Medical Gases
    - Fire & Hydraulics
- Outline the proposed works and relevant design criteria including environmental requirements and applicable Australian Standards which shall be complied with
- Describe any consultation to date with service providers and describe what new connections will be required as part of the Cowra Hospital works.

Refer to Appendix D for a summary plan of the services located around the site.

2 Electrical Services

2.1 Codes, Standards and Guidelines

The electrical systems will be designed to comply with the most current version of all relevant Codes and Standards, including but not limited to, the following:

- National Construction Code (NCC) 2022
- Supply Authority services rules
- NSW Service Installation Rules
- Local Council Regulations
- NSW Health Infrastructure Standards, Policies, Procedures and Guidelines (SPPG)
- NSW Health Infrastructure Engineering Services Guidelines 2022
- NSW Health Infrastructure Design Guidance Notes
- Australian Health Facility Guidelines (AusHFG)
- Electrical Services - AS/NZS 3000
- Electrical Installations – Patient Areas - AS/NZS 3003
- Electrical Installations – Selection of Cables - AS/NZS 3008
- Electrical Installation – Emergency Power Supplies - AS/NZS 3009
- Low Voltage Switchgear - AS/NZS 61439
- Uninterruptible power systems (UPS) – AS 62040
- Artificial Lighting - AS/NZS 1680.0, AS/NZS 1680.1, AS/NZS 1680.2.1, AS/NZS 1680.2.2, AS/NZS 1680.2.3
- Emergency Escape Lighting and Exit Signs for Buildings - AS 2293
- Telecommunications Installations – AS/NZS 3080
- Telecommunications Installations - AS/NZS 3084
- Hard-wired patient alarm systems – AS 3811
- Requirements for customer cabling products – AS/CA S008
- Installation requirements for customer cabling (Wiring Rules) – AS/CA S009
- NBN-COO-EDS-017: nbn New Development Pit and Pipe Design Guidelines
- NBN-TE-CTO-194: New developments - deployment of the nbn pit and conduit network
- NSW Health ICT Cabling Standard Version 4.0
- NSW Health ICT Rooms Standard Version 1.0

- HI Protecting People and Property Manual

2.2 Proposed Works

The main works for Cowra Hospital shall include the installation of new electrical systems throughout the hospital building and external site. All new systems will be designed to comply with the codes, standards and guidelines as outlined in the previous section. See below for a summary of each system to be designed and installed.

Electrical infrastructure:

- New substation and HV reticulation
- Site main switchboard
- Consumer mains and submains
- Distribution boards
- Energy management and power supply metering
- Power factor correction and harmonic filtering
- Surge protection
- Emergency power supply
- Uninterruptible power supply
- Small power
- Medical service panels
- Other building services supplies
- Lighting, including internal, external and emergency lighting with respective control systems
- Photovoltaics system
- Lightning protection

ICT infrastructure:

- Diverse lead-in connections
- Structured cabling system (data and voice services)
- Wireless LAN (wi-fi)
- Nurse call system
- Master clock
- Patient entertainment system
- Hearing augmentation system

- Monitoring system (TBC)
- MATV (TBC)
- Mobile coverage (TBC)

Security infrastructure:

- CCTV system
- Access control system
- Fixed duress alarms
- Intercom

2.3 Connections Required and Consultation with Service Providers

2.3.1 Low Voltage Supply

The Cowra region electrical utility provider is Essential Energy. Initial reviews of the existing site have been conducted using information gathered from the following sources:

- Dial Before You Dig documentation
- Essential Energy Network Information Portal (GIS)

Based on this information there is an existing 500kVA substation within the Cowra Hospital site which supplies the existing hospital. Refer to the below image shown in the location of the substation along Brisbane Street side. In addition, there is existing overhead 11kV power lines which reticulate adjacent to Brisbane Street on the western side of the hospital boundary.

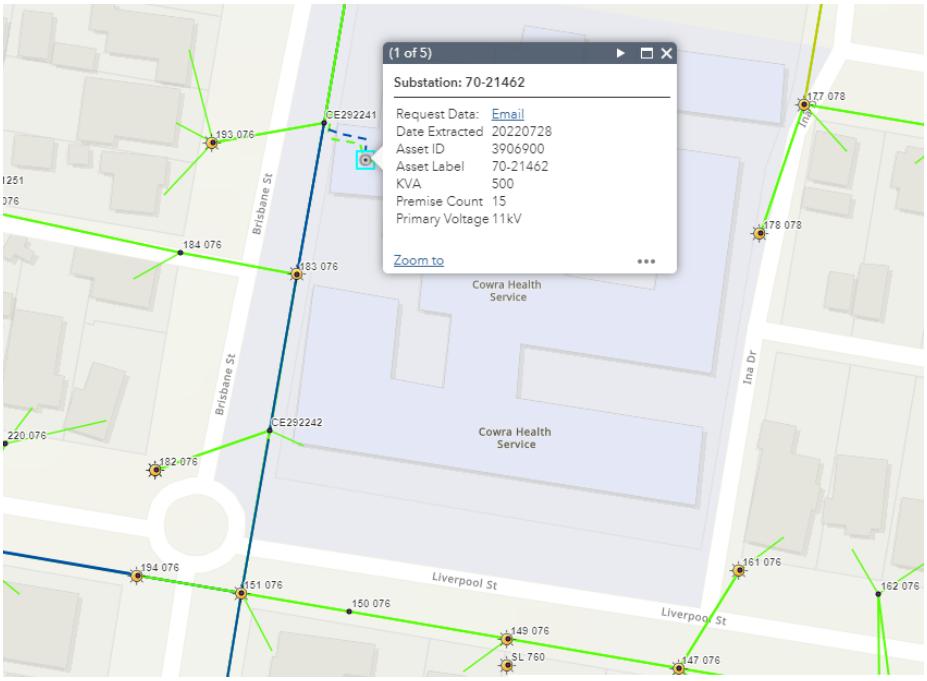


Figure 1 Existing LV infrastructure

The site maximum demand for the new Cowra Hospital has been calculated based on information available at the time and estimated to be in the vicinity of 700kVA. This assessment is based on the following parameters:

- Schedule of area as per architectural drawings for new building
- Diversified VA/SQM figures for appropriate areas
- Metered power supply demand of the existing electrical installation
- Consideration of specific equipment electrical parameters
- Mechanical services power demand
- Hydraulic and fire services power demand

Based on preliminary calculation the estimated site maximum demand is above the capacity of the existing substation and so the electrical supply will need to be augmented to allow for the increased load. In addition, as part of the construction works there will be the need to maintain the electrical supply while the hospital is in an interim state of operation.

As part of the future design stage an application will be made to the electrical supply authority to confirm supply availability. Note that the new hospital is also planning to include a photovoltaic (PV) system on the roof of approx. 99kWp (TBC). This information will also be provided to the supply authority as part of the application.

The design of the modifications to the supply authority network and details of the site, such as point of connection and location of substation will be captured in documentation developed by a certified Level 3 Accredited Services Provider (ASP). This information will be submitted to the supply utility for review with the intent to receive certification. This certified design will form part of the electrical design package of works.

2.3.2 ICT Lead-in

An initial review of the existing site infrastructure has been conducted using information gathered from the following sources:

- Dial Before You Dig documentation

As per the summary sketch shown in Appendix C showing the existing electrical infrastructure there is an existing ICT lead-in connection from the pit and pipe infrastructure along Liverpool Street.

The existing ICT lead-in will be maintained throughout the construction phase until the new Campus Distributor is ready to be switched over. At this time the existing ICT lead-in will be decommissioned, and a new pit and pipe pathway utilised.

As part of the Health Infrastructure ICT Cabling Standard there is also an additional requirement to provide diverse and redundant ICT lead-in connections to each Campus Distributor. Hence the new hospital will require 2no. new ICT connections from the street network.

From the information available on the NBN Co. rollout map as of 14/11/2022, connection to the NBN is available for the site with ‘Fibre to the Node (FTTN)’ being available in the area. However, the disclaimer is provided that additional works may be required at the time of connection, as this site has not previously been connected to the NBN Co. In any case, the final coordination of the new 2no. ICT lead-ins will be coordinated as part of the contractors works and will utilise pit and pipes to connect to the new Campus Distributor.

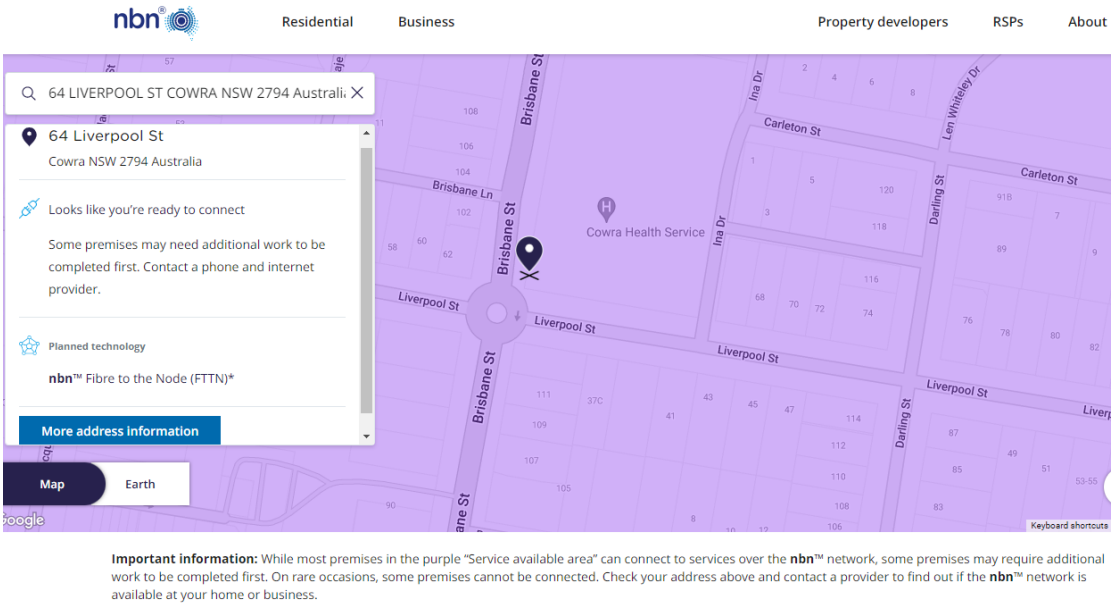


Figure 2 NBN Co rollout map for Cowra Hospital

3 Mechanical Services

3.1 Codes, Standards and Guidelines

The mechanical systems will be designed to comply with the most current version of all relevant Codes and Standards, including but not limited to, the following:

- National Construction Code (NCC) 2022
- AS 1668.1:2015 – The Use of Ventilation and Air Conditioning in Buildings, Part 1: Fire and Smoke Control in Multi-Compartment Buildings
- AS 1668.2:2012 – The Use of Ventilation and Air Conditioning in Buildings, Part 2: Mechanical Ventilation for Acceptable Indoor-Air Quality
- AS/NZS 3666:2011 – Air-handling and water systems of buildings – Microbial control
- AS 1170.4:2007 – Structural Design Actions: Earthquake Actions in Australia
- Australian Gas Authority and Local Council Regulations
- NSW Health Infrastructure Standards, Policies, Procedures and Guidelines (SPPG)
- NSW Health Infrastructure Engineering Services Guidelines dated Aug 2022
- NSW Health Infrastructure Design Guidance Notes 1 – 62
- Australian Health Facility Guidelines (AusHFG)
- Australian Gas Authority and Local Council Regulations
- The Australian Institute of Refrigeration, Air Conditioning and Heating (AIRAH) Handbook.

3.2 Proposed Works

The new mechanical services will include:

- Chilled water system
- Condenser water system
- Heating hot water system
- Air handling units
- Fan coil units
- Air distribution
- Mechanical ventilation
- Miscellaneous air conditioning systems
- Specialist negative flow room systems
- Specialist cool room systems (depending on mortuary requirements)

- Mechanical services power supplies
- Building management and control system (BMCS)

At present it is assumed the following are not required:

- Smoke control systems. It is assumed the building will be < 25m.
- Naturally ventilated areas
- Autoclave sterilisation units
- Steam boilers
- Pneumatic tube system

3.3 Connections Required and Consultation with Service Providers

No consultation with service providers is required as all new mechanical services systems will be standalone within the new building. No new mechanical services system connections will be required to existing services infrastructure as part of the Cowra Hospital works.

4 Medical Gas Services

4.1 Codes, Standards and Guidelines

The medical gas systems will be designed to comply with the most current version of all relevant Codes and Standards, including but not limited to, the following:

- National Construction Code (NCC) 2022
- AS18494:1997 The storage and handling of non-flammable cryogenic and refrigerated liquids
- AS4332:2004 The storage and handling of gases in cylinders
- AS 2896:2021 - Medical gas systems
- NSW Health Infrastructure Standards, Policies, Procedures and Guidelines (SPPG)
- NSW Health Infrastructure Engineering Services Guidelines dated Aug 2022
- NSW Health Infrastructure Design Guidance Notes 1 – 62
- NSW Health Infrastructure Guidelines for Hospital Helicopter Landing Sites dated Jul 2016
- Australian Health Facility Guidelines (AusHFG)
- International Health Facility Guidelines (iHFG)
- Local Council Regulations

4.2 Proposed Works

The new medical gas systems will include:

- Oxygen
- Medical Air
- Suction
- Nitrous Oxide
- Surgical Tool Air
- Carbon Dioxide
- Dental Air
- Dental Suction
- Compressed Air
- Medical services panels (by electrical trade)
- Medical gas alarm panels and shut off valves
- Medical gas pipeline systems

4.3 Connections Required and Consultation with Service Providers

No consultation with service providers is required as all new medical gas services systems will be standalone within the new building. No new medical gas services system connections will be required to existing services infrastructure as part of the Cowra Hospital works.

5 Hydraulic Services

5.1 Codes, Standards and Guidelines

The fire services systems will be designed to comply with the most current version of all relevant Codes and Standards, including but not limited to, the following:

- Plumbing and Drainage Act and Regulation 2011 and Plumbing and Drainage Regulation 2017
- National Construction Code (NCC) 2022
- BCA/building surveyor requirements
- Plumbing Code of Australia 2022
- AS 3500.1:2021 – Plumbing and drainage Part 1: Water Services
- AS 3500.2:2021 – Plumbing and drainage Part 2: Sanitary plumbing and drainage
- AS 3500.3:2021 – Plumbing and drainage Part 3: Stormwater drainage
- Cowra Council requirements
- Worksafe and OH&S requirements
- AGA and Jemena requirements

5.2 Proposed Works

The main works for Cowra Hospital shall include the installation of new hydraulics systems throughout the hospital building and external site. All new systems will be designed to comply with the codes, standards and guidelines as outlined in the previous section. The below outlines each system to be designed and installed.

Hydraulics infrastructure:

- Domestic hot water plant
- Cold water systems (tank, pumps and filtrations)
- Reverse Osmosis (RO systems)
- Sanitary Drainage
- Trade Waste
- Stormwater Drainage
- Natural Gas systems

5.3 Connections Required and Consultation with Service Providers

5.3.1 Water

The location of the proposed new building is in close proximity to the Water Treatment Plant (WTP) which supplies the existing site. There are three supplies from the WTP along Brisbane Street from the intermediate supply and low level supply. Refer to Appendix A for information on the water network and pressure and flow test results.

The existing building is served from the 200mm main along Brisbane Street, the connection for which shall be retained until the existing building is taken offline.

A new 150mm main will be taken from the 200mm AC main along Brisbane Street, which serves the existing hospital. The 200mm main with highest available flow and pressure along Brisbane Street is not suitable for new connections due to its location and depth, therefore Cowra Council have expressed a preference to connect to the main which serves the existing building, as indicated below.

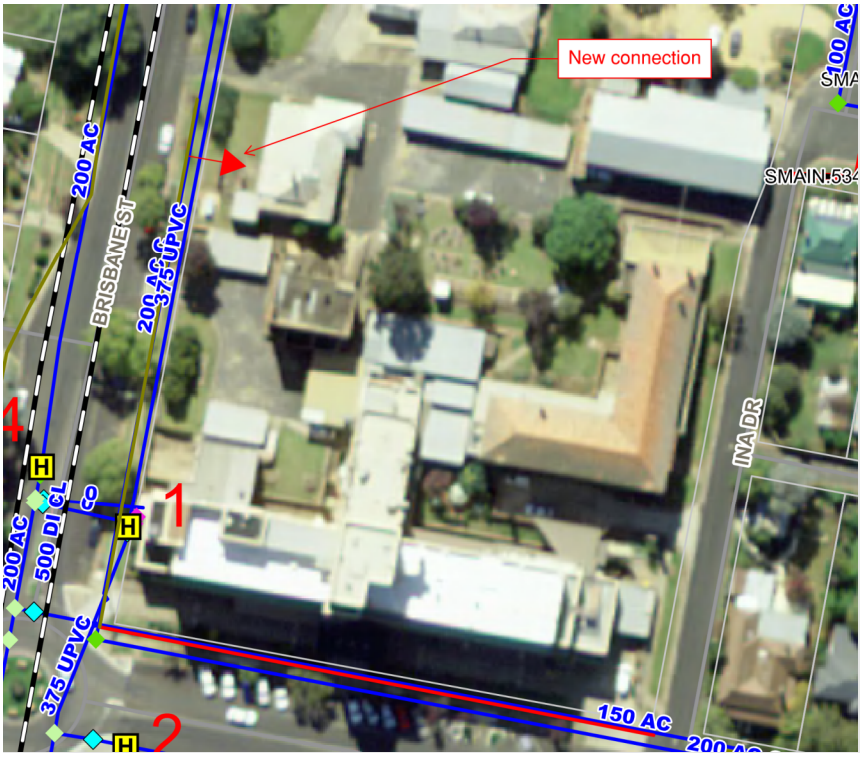


Figure 3: Water Supply Network

A new water meter will be provided. The building will be provided with a cold water storage tank and booster pump sets sized to provide 3 hours emergency supply to the building.

5.3.2 Sewer

The current proposal is for the new building to connect into the existing 150mm concrete utility sewer along Ina Drive. Refer to Appendix B for DBYD information showing utility sewer locations. It is assumed that the capacity will be sufficient for the new building as the overall load of the existing site is not expected to increase significantly. The council has been informed of this proposal and no issues are foreseen with connecting into this sewer main.

Figure 4: Snapshot from DBYD (Sewer)

A new private sewer line will be provided along the East of the site, before connecting into the utility main. The building will be provided with a grease arrestor to serve the kitchen and a dilution pit to serve the pathology areas. Plaster traps will be provided on sanitary drainage as required in dental facilities.

5.3.3 Gas

Existing Jemena gas mains are available running along roads adjacent to the site as follows:

- Liverpool Street: 50mm gas main @210kPa
- Brisbane Street: 32mm gas main @210kPa
- Ina Drive: incoming connection to site from 32mm @210kPa gas main on Carleton Street.

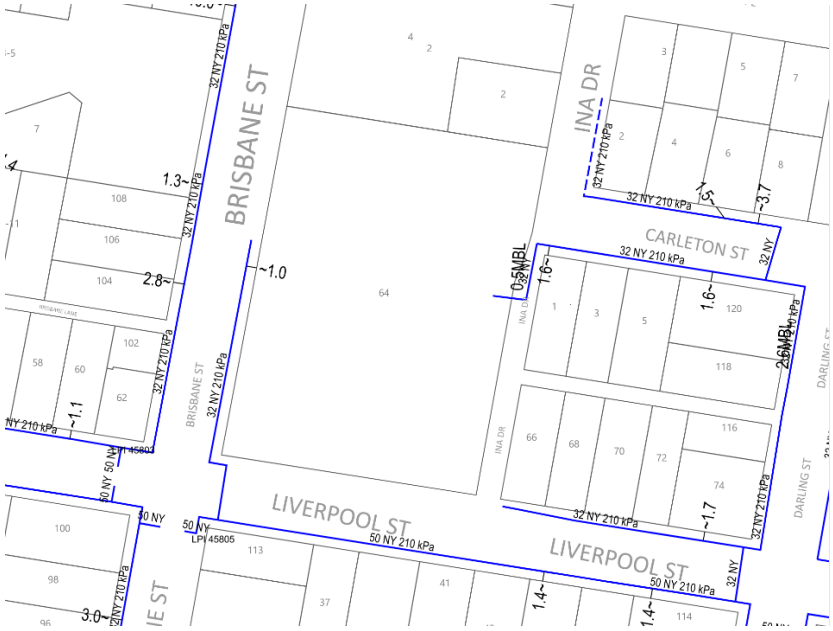


Figure 5: Snapshot from DBYD (natural gas)

The current proposal is to provide a new connection to the building from the 32mm 210kPa main along Brisbane Street which serves the existing main hospital. Natural gas is required to serve the building's kitchen, domestic hot water and mechanical plant. A new authority gas meter for the building will be located externally.

6 Fire Services

6.1 Codes Standards and Guidelines

The fire services systems will be designed to comply with the most current version of all relevant Codes and Standards, including but not limited to, the following:

- Fire Engineering Report (TBC)
- National Construction Code (NCC) 2022
- AS 1670.1:2018 Fire Detection, Warning, Control and Intercom Systems – System Design, Installation and Commissioning – Fire
- AS1670.4:2018 Fire Detection, Warning, Control and Intercom Systems – System Design, Installation and Commissioning – Emergency warning and intercom systems
- AS 2118.1:2017 Automatic Fire Sprinkler Systems Part 1: General Requirements
- AS 2118.6:2012 Automatic Fire Sprinkler Systems Part 6: Combined sprinkler and hydrant systems in multistorey buildings
- AS 2419.1:2021 Fire hydrant installations Part 1: System design, installation, and commissioning

- AS2941:2013 Fixed fire protection installations – Pump set systems
- Fire Rescue NSW regulations and Fire Engineering Requirements
- BCA/Building Surveyor requirements
- Manufacturer's Guidelines
- Electrical Supply Authorities

6.2 Proposed Works

The main works for Cowra Hospital shall include the installation of new fire systems throughout the hospital building and external site. All new systems will be designed to comply with the codes, standards and guidelines as outlined in the previous section. The below outlines each system to be designed and installed.

Fire Services infrastructure:

- Fire Hydrant System
- Fire Sprinkler System
- Fire Hose Reels
- Portable Fire extinguishers
- Fire Detection

6.3 Connections Required and Consultation with Service Providers

As described in Section 6.2, a new connection from the existing 200mm AC water main along Brisbane Street will be provided for the new hospital. The available flow and pressure in the main (Appendix A) is not sufficient to serve the new building's fire systems, therefore the site will be provided with fire tanks and pumps to serve a combined hydrant and sprinkler system. The new building's fire systems will be independent from the existing building's systems, which shall remain in place until the systems are taken offline.

The proposed location of the new fire brigade booster assembly and hardstand are shown in figure below.

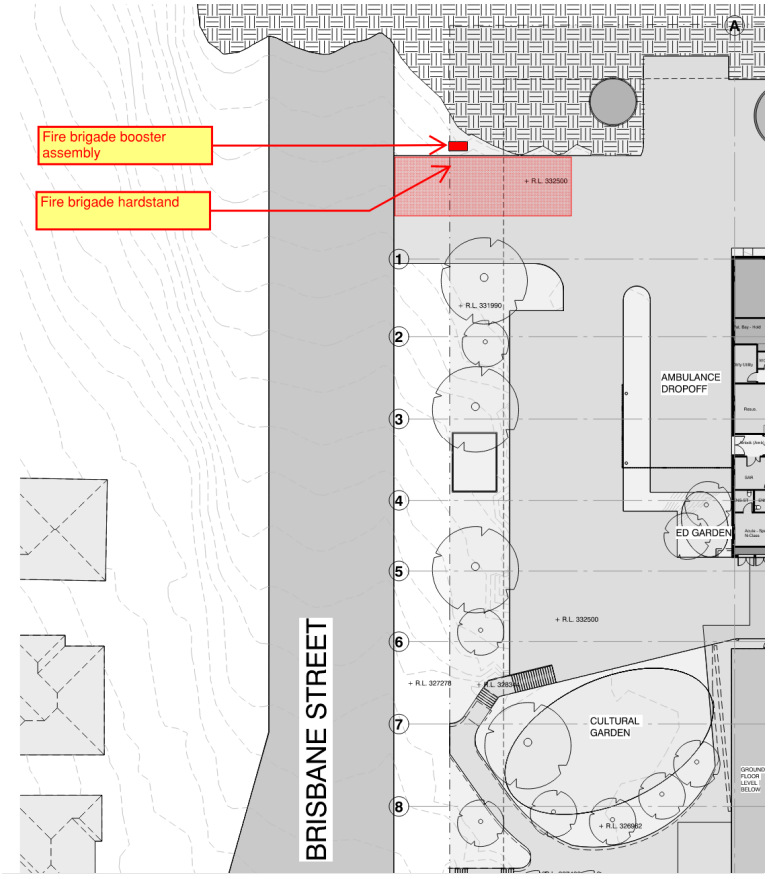


Figure 6: Proposed Fire Brigade Booster and Hardstand Location

Appendix A – Water Mains Test

Pressure Test

Location of Test: Hospital (near Hydrant Booster) (1)

Description of Test: Pressure / Flow

Date: 08/2/22 Time: 8:00 am Test By: CC / AS

Flow (L/S) Maximum Pressure Minimum Pressure

0	Static 240 kpa	
5	220 kpa	
10	180 kpa	
15	80 kpa	
20	18L Zero	
25		
Max		

Meter Reading Start 49.89 Finish 54.65

- **Instructions**

1. Install standpipe in hydrant – record meter reading
2. Close gate valve, open standpipe (no flow) – record pressures
3. Adjust gate valve to get required flow – record pressure
4. Fully open gate valve – record max flow and pressure
5. Turn off standpipe – record meter reading

Note: Working of hydrant with a standard standpipe prior to test maybe needed to achieve maximum flow potential. Maximum and minimum pressure indicators on sheet are for variations of pressure for flow (L/S)

Pressure Test

Location of Test: Roundabout Liverpool St physio (2)

Description of Test: Pressure | Flow

Date: 08/2/22 Time: 8:15 Test By: CC | A·S

Flow (L/S) Maximum Pressure Minimum Pressure

0	Static 270 kpa	
5	250 kpa	
10	210 kpa	
15	100 kpa	
20	18 Zero	
25		
Max		

Meter Reading Start Finish

- **Instructions**

1. Install standpipe in hydrant – record meter reading
2. Close gate valve, open standpipe (no flow) – record pressures
3. Adjust gate valve to get required flow – record pressure
4. Fully open gate valve – record max flow and pressure
5. Turn off standpipe – record meter reading

Note: Working of hydrant with a standard standpipe prior to test maybe needed to achieve maximum flow potential. Maximum and minimum pressure indicators on sheet are for various flow

Pressure Test

Location of Test: Liverpool st Cemergency end hospital 13

Description of Test: Pressure | Flow test

Date: 09/02/22 Time: 7:10 am Test By: CC/A·S

Flow (L/S) Maximum Pressure Minimum Pressure

0	Static 260 kpa	
5	80 kpa	
10	7L/S – zero kpa	
15		
20		
25		
Max		

Meter Reading Start [redacted] Finish

- **Instructions**

1. Install standpipe in hydrant – record meter reading
2. Close gate valve, open standpipe (no flow) – record pressures
3. Adjust gate valve to get required flow – record pressure
4. Fully open gate valve – record max flow and pressure
5. Turn off standpipe – record meter reading

Note: Working of hydrant with a standard standpipe prior to test maybe needed to achieve maximum flow potential. Maximum and minimum pressure indicators on sheet are for variations of pressure for flow

Pressure Test

4

Location of Test: Cowra hospital (Brisbane St middle Road)

Description of Test: Pressure/flow test

Date: 09/2/22 Time: 7:30 am Test By: CC/AS

Flow (L/S) Maximum Pressure Minimum Pressure

0	Static 400 kpa	
5	395 kpa	
10	360 kpa	
15	220 kpa	
20	60 kpa	
25		
Max		

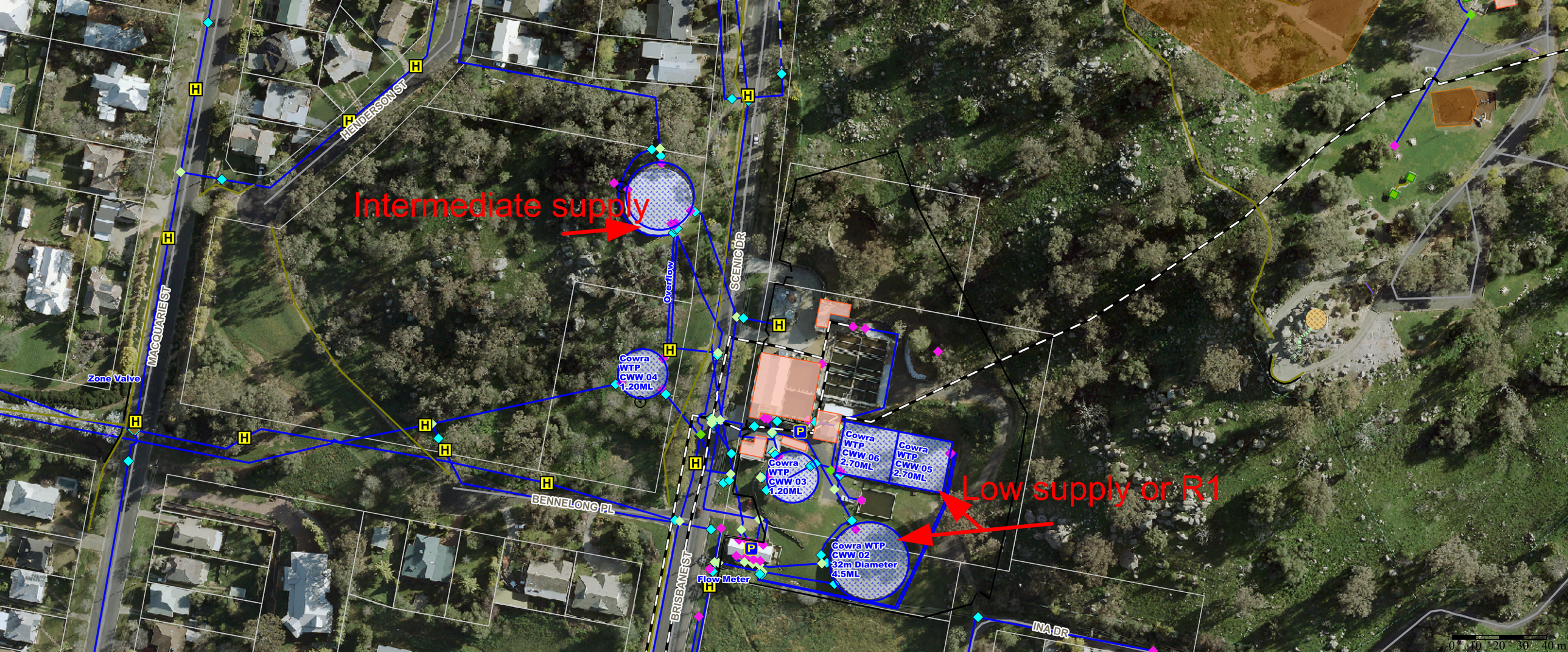
Meter Reading Start Finish

- **Instructions**

1. Install standpipe in hydrant – record meter reading
2. Close gate valve, open standpipe (no flow) – record pressures
3. Adjust gate valve to get required flow – record pressure
4. Fully open gate valve – record max flow and pressure
5. Turn off standpipe – record meter reading

Note: Working of hydrant with a standard standpipe prior to test maybe needed to achieve maximum flow potential. Maximum and minimum pressure

Appendix B – DBYD Sewer Information


Intermediate supply
Low supply or R1
HENDERSON ST
MACQUARIE ST
SCENIC DR
BENNELONG PL
BRISBANE ST
INA DR
Overflow
Zone Valve
Flow Meter
Cowra WTP CWW 04 1.20ML
Cowra WTP CWW 03 1.20ML
Cowra WTP CWW 06 2.70ML
Cowra WTP CWW 05 2.70ML
Cowra WTP CWW 02 32m Diameter 4.5ML
0 10 20 30 40 m

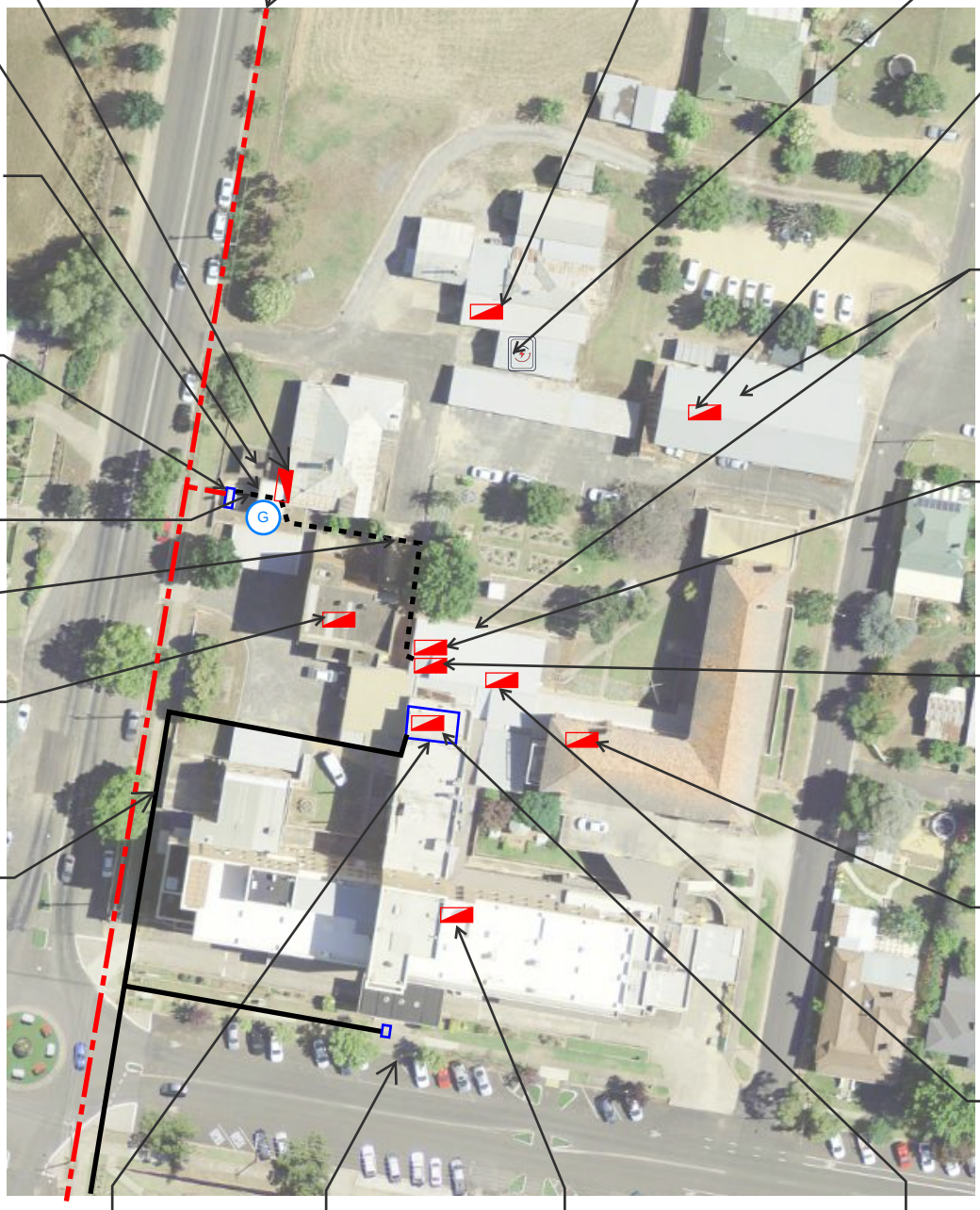
Intermediate Res
Low Level Supply Res
Bellevue Hill RW 44
0.11ML
BWL 405.5m TWL: 407.8m
Bellevue Hill RW 42
0.11ML
BWL 405.5m TWL: 407.8m
Cowra WTP
CWW 06
2.70ML
Cowra WTP
CWW 02
Flow Meter
Zone Valve
SMAIN.5468
SMAIN.5345
SMAIN.5347
SMAIN.5349
SMAIN.5346
COOTA LN
HENDERSON ST
BENNELONG PL
MACQUARIE ST
BRISBANE ST
BRISBANE LN
LIVERPOOL ST
LIVERPOOL LN
CARLETON ST
INA DR
DARLING ST
FITZROY ST
TAFE CARPARK
COLLEGE DR
FROST ST
BELLEVUE HILL/SCENIC DR
250 CI
200 UPVC
375 AC
150 AC
100 AC
100 CI
100 PVC
300 CI
200 AC
500 DI CI
200 CI
150 AC
38 GAL


SAVEGRT
100 PVC
100 PVC
BRISBANE LN
BRISBANE ST
200 AC
200 AC
375 UPVC
4
500 DI CL
C
1
100 AC
LIVERPOOL ST
100 AC
100 AC
200 AC
375 UPVC
2
150 AC
200 AC C
200 CI
3
LIVERPOOL ST
200 PVC
300 CI
BRISBANE ST
375 UPVC
SERVICES CLUB CARPARK
SMAIN.5345
SMAIN.5346
SMAIN.5347
SMAIN.5349
100 AC
100 CI
CARLETON ST
100 CI
CARLETON ST
INA DR
LIVERPOOL LN
100 PVC
DARLING ST
150 AC
150 AC
LIVERPOOL ST
100 AC
200 AC
DARLING ST
100 AC
0
10
20
30
40 m


SMH.127
150 CONC
SMH.434B
SMH.434C
150 CONC
SAJE CRT
150 CONC
SMH.053
150 CONC
MACQUARIE ST
SMH.123
150 CONC
SMH.124
150 CONC
BRISBANE LN
SSMH.125
150 CONC
SMH.126
BRISBANE ST
150 EWP
SMH.525B
150 EWP
BELLEVUE HILL/SCENIC DR
150 EWP
INA DR
SMH.091
150 CONC
SMH.092
150 EWP
SMH.525A
150 CONC
SMH.0
SMH.524A
SMAIN.5346
CARLETON ST
CARLETON ST
150 CONC
INA DR
SMH.089
150 CONC
SMH.093
LIVERPOOL LN
DARLING ST
SMH.121
150 CONC
SMH.122
LIVERPOOL ST
150 CONC
SMH.26B
150 CONC
SMH.26C
150 CONC
SMH.088
150 CONC
SMH.087
150 PVC
SMH.528C
150 CONC
SMH.528B
150 CONC
150 CONC
150 CONC
SMH.26A
LIVERPOOL ST
SMH.101
SMH.117
150 CONC
SMH.118
150 CONC
SMH.119
150 CONC
SMH.116
150 CONC
SMH.095
SERVICES LD CARPARK
150 CONC
SMH.094
150 CONC
SMH.086
150 CONC
SMH.528A
150 CONC
SMH.51
LIVERPOOL ST
BRISBANE ST
DARLING ST
SMH.115
150 CONC
150 CONC
150 CONC
SMH.100
0 10 20 30 40 m

Appendix C – Existing Electrical Infrastructure

Cowra Hospital Arup Site Survey Drawing
12/01/2022
Electrical and ICT Services



Site Main LV Switchboard

Old substation
-removed
-concrete plinth remains

Generator Room:
-Generator
-Fuel tank 500l
-Main Switchboard
-PFC
-Utility Meter
-ATS

Kiosk Substation
-Rating tbc
-Essential Energy
-Below ground connection from adjacent pole

Below ground consumer mains

Main LV Distribtion cable route

Boiler House DB
-Fed from MSB
-Demolish
-Location tbc

Hospital ICT Lead-in
-below ground
-Telstra
-NBN not installed

Above ground HV Cable
-Essential Energy
-11kV

Workshop DB
-Fed from MSB
-PV inverter x 3
-Demolish

PV Inverters x 3
-From workshop DB

Special Needs DB
-Fed from Workshop DB
-demolish
-Location tbc

PV installed on Roof
-3 x 20kW solar inverter
-1 x 25kW solar inverter
- 302 x 290W JA Solar Monocrystalline panels

Main Site Distribution Board (DB/OSA)
-Fed from MSB
-Retain
-Demolish some of the loads as indicated on this sketch

Hospital & Kitchen DB
-Fed from MSB
-Retain
-Main Building Main Distribution Board Supply

Staff Accommodation Distribution Board
-fed from DB/OSA
-Location tbc

Pharmacy Distribution Board
-fed from DB/OSA
-Location tbc

Site Main Comms Room
-Telstra Fibre
-Telstra Copper
-Main Racks
-Duress Alarm headend

NBN Cabinet
-Retain

Main Building, Main Distribution board
-Supplies final circuits
-Supplies other DBs within the main building

PABX Room Distribution Board
-fed from DB/OSA

Legend

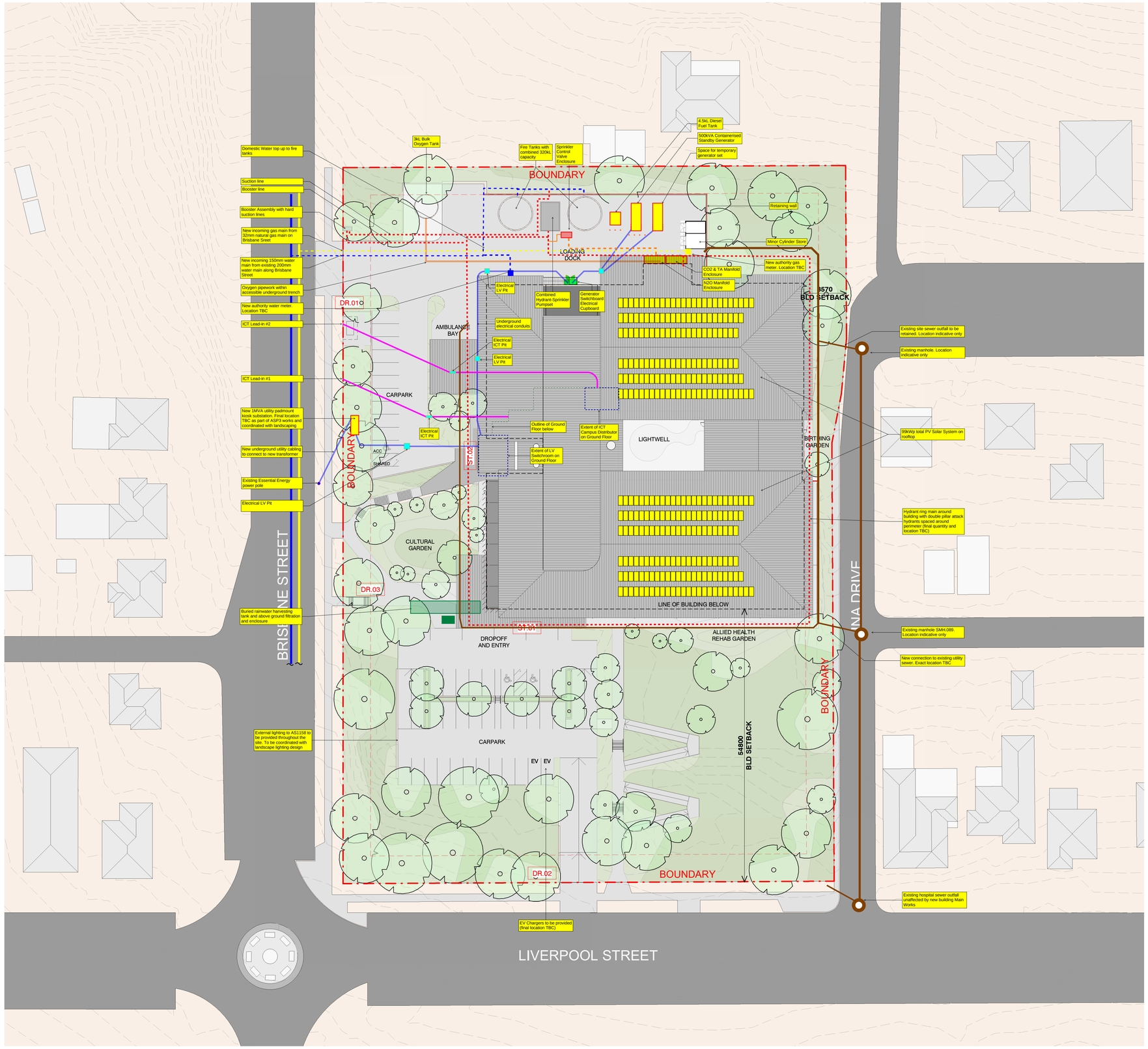
- Switchboard/Distribution board
- HV cable
- LV below ground cable
- Comms
- G — Generator

Boards/Loads to be located:

- Old Stores S/B
  Medical Records
  -fed from DB/OSA
- West Pharmacy
  Drug Fridge
  -fed from DB/OSA
- Lifts S/B
  -fed from DB/OSA
- East Pharmacy
  Drug Fridge
  -fed from DB/OSA
- PV Inverter
  -fed from DB/OSA
- Pharmacy AC
  -fed from DB/OSA

Appendix D– Site Plan Services Sketch

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300mm at A1



SITE PLAN LEGEND

- TREES - REFER LANDSCAPE PLAN
- EXISTING SURROUNDING BUILDING
- MAIN ENTRY TO FRONT OF HOUSE
- RETAINING WALL
- 5.5 METER SETBACK
- SITE BOUNDARY
- XX.00 SIGNAGE AND WAYFINDING. REFER TO DWG ***REF 70*** FOR DETAILS
- Utility Manhole
- Cold Water Pipework
- Utility Water Main
- Sewer Pipework
- Natural Gas Pipework
- Utility Gas Main
- Fire main
- Sprinkler Pipework
- Electrical LV conduits
- Comms conduits
- Electrical equipment (as noted)
- Electrical cable pit
- Oxygen pipework

Notes:

1. Sketch provided for information regarding services as part of REF Report submission.

2. Layouts of equipment and services within site are indicative only and subject to further design development and coordination.

3. Final location of all utility connections to be finalised with relevant authorities.

This drawing should be read in conjunction with all relevant contracts, specifications and drawings. Dimensions are in millimetres. Levels are metres. Do not scale off drawings. Use figured dimensions only. Check dimensions on Site. Report discrepancies immediately.

NOTES

AUTHORISED FOR ISSUE DIRECTOR

SIGN OFF DATE

ISSUE	DATE	SUBJECT	VALID'N.
D	09/12/22	ISSUED FOR REF	GF
C	01/12/22	Final - For MW REF	DB
B	25/11/22	REVISED DRAFT REF	DB
A	18/11/22	PRELIMINARY DRAFT REF	DB

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PROJECT

COWRA HOSPITAL REDEVELOPMENT

Cowra Hospital
Proposed Site Services - REF Main Works

Project Name	Cowra Hospital
Job Number	285207-00
Sketch Number	
Date	16/12/22
Revision	1
For Information	

ARUP