

UTILITIES SEARS REPORT

Campbelltown Hospital
ELECTRICAL INFRASTRUCTURE SERVICES

JHA

CONSULTING ENGINEERS

DOCUMENT CONTROL SHEET

Title	Utilities SEARS Report
Project	Campbelltown Hospital Redevelopment, Stage 2
Description	Report on electrical services infrastructure suitable for SEARS submission
Key Contact	Brenton Burrows

Prepared By

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Authorised	Jim Hatzimanolis

Revision History

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Meegan Babe – Root Partnership	REV	A	B	C	D				
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1. EXECUTIVE SUMMARY

This report has been prepared by JHA to identify and summarise the proposed Utility infrastructure requirements, which will be incorporated into the design of the proposed new Stage 2 development at Campbelltown Hospital

This report demonstrates compliance with the Secretary's Environmental Assessment Requirements (SEARS) which apply to the project and has been prepared to accompany a State Significant Development Application to the NSW Department of Planning and Environment. This report should be read in conjunction with the Architectural design drawings and other consultant design reports submitted as part of the application.

The report identifies how the principles of infrastructure management plans will be incorporated in the design and during the phases of the development.

2. INTRODUCTION

2.1 Project Description

The proposed Campbelltown Hospital Redevelopment-Stage 2 (CHR) is located at 100 Parkside Cres, Campbelltown NSW and forms part of the South Western Local Health District (SWLHD).

The Stage 2 works consist predominantly of a new build of approximately 60,000m² and some off setting demolition works. The key criteria of the proposed redevelopment are the need to ensure the existing hospital maintains functionality at all times.

The new works can be summarised as follows:

2.1.1 New Building 1

New build of approximately 60,000m² GFA which will include the following departments:

- Emergency Department
- Operating theatres
- Intensive Care Units
- In-Patient Units
- Mental Health

2.2 Secretary's Environmental Assessment Requirements (SEARS)

This report acknowledges the SEARS prepared by the Secretary which notes the following in Section 11 of the document:

12. Utilities

- Prepare an Infrastructure Management Plan in consultation with relevant agencies, detailing information on the existing capacity and any augmentation requirements of the development for the provision of utilities including staging of infrastructure.

JHA was engaged for electrical and communication services for this project. As such, this report will only focus on electrical infrastructure (Endeavour) only. It is proposed that the new works will utilise the existing communication services infrastructure already existing at the hospital. No further liaising or additional communications Provider infrastructure is proposed under this stage of the project.

3. ELECTRICAL SERVICES

The electrical supply infrastructure will be incorporated into the design and construction phases of the development as follows:

3.1 Proposed Maximum Demand

Electrical calculations for the final development were undertaken and have yielded an electrical load requirement of approximately 9MVA. The existing electrical infrastructure to the site (currently a single high voltage feeder of 4.5MVA) has been deemed insufficient to provide the required calculated electrical demand to the new development.

A summary table of the maximum demand is below:

AREA	MAXIMUM DEMAND ASSESSMENT
New Build	6,500kVA
Demolition	700kVA
Net Additional Load	5.8MVA
Existing Load	3.2MVA
TOTAL	9MVA

On the basis that the existing high voltage feeder can only deliver a maximum of 4.5MVA an additional high voltage feeder (rated at 4.5MVA) will be needed to accommodate the anticipated site maximum demand of 9MVA.

3.2 Existing Infrastructure Capacity

The hospital is fed by the network distributor Endeavour Energy and has an internal private HV network at 11kV. The HV network emanates from two sources. The primary supply is fed from a switching station at the boundary of Parkside Crescent and the backup source from another switching station at the boundary adjacent Appin Road.



Existing External HV Reticulation

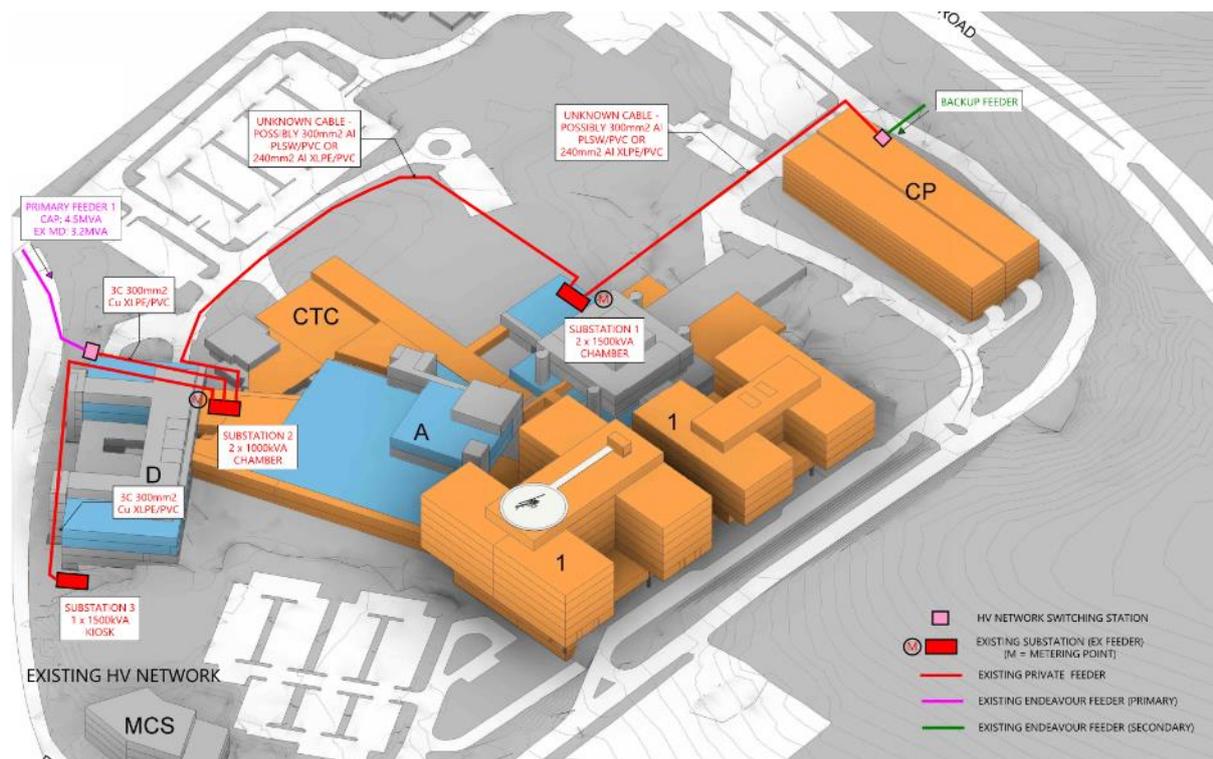
Internally the 11kV supply reticulates underground via high voltage switchgear within chamber substation 2, then chamber substation 1 and terminates at the backup feeder switching station, creating a two feeder supply.

A normally open point in the network is situated within substation 1, disconnecting the backup feeder in normal operation. A further single feeder underground cable reticulates to substation 3 from substation 2.

Internal to the sub and switching stations, the following configurations were observed:

- Primary Feeder Switching Station – Schneider SM6 switchgear
- Substation 1 – Chamber Style 2 x 1500kVA Wilson Oil Type TXs with 2 Feeder Eaton Holec HV switchgear
- Substation 2 – Chamber Style 2 x 1000kVA Wilson Oil Type TXs with 3 Feeder Eaton Holec HV switchgear.
- Substation 3 – Kiosk Style 1 x 1500kVA Oil Type with 2 feeder HV switchgear (keys were not located to open at our inspection).
- Secondary Feeder Switching Station - Unknown (keys were not located to open at our inspection)

Metering for the site is via HV CT metering, situated within substation 1 and substation 2 outgoing legs of the HV switchgear. Meter panels are situated outside the substation within the exit corridor of substation 1 and the main switchroom of substation 2.



Existing HV Reticulation Layout

3.3 Endeavour Application

Preliminary advice from Endeavour Energy indicates the maximum demand of 9MVA is in excess of the hospital's current capacity. Endeavour has reported the sites current capacity is 4.5MVA (1 HV Feeder).

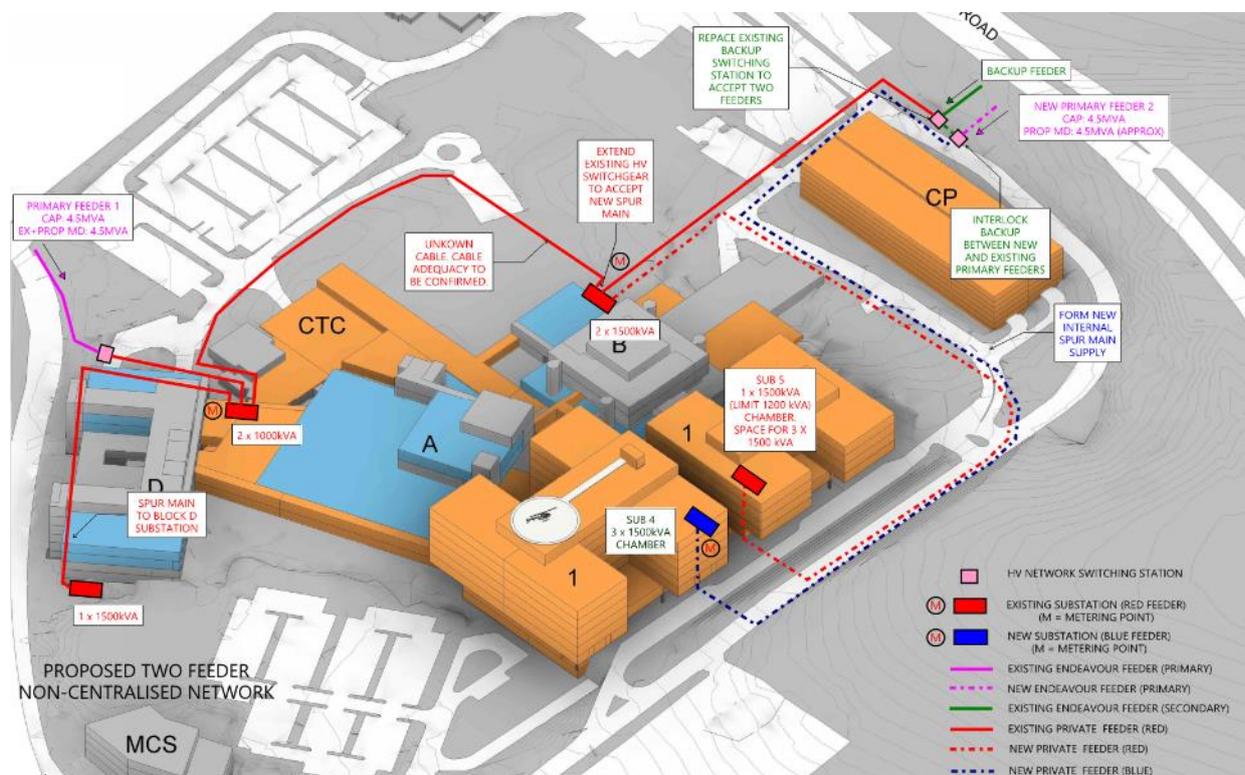
High level discussions and a formal application to Endeavour has resulted in feedback that a new HV feeder will need to be installed to serve the development. At the time of writing this report the distributor had yet to indicate where the new HV feeder will reticulate from external to the site.

Refer to Appendix A for a copy of correspondence with Endeavour Energy.

3.4 Proposed Private Substations and HV Reticulation

The existing onsite private network will be augmented to suit new the HV feeders. An additional switching station will be installed as well tie cabling and switches to interlink the backup feeder.

New HV cabling will reticulate underground and will connect to 2 off new chamber substations within the new building 1. One of the chamber substations will house 3 off 1500kVA transformers and will be connected to the new HV feeder. The other chamber substation will house 1 off 1500kVA transformer and will be connected to the existing HV feeder for the site.



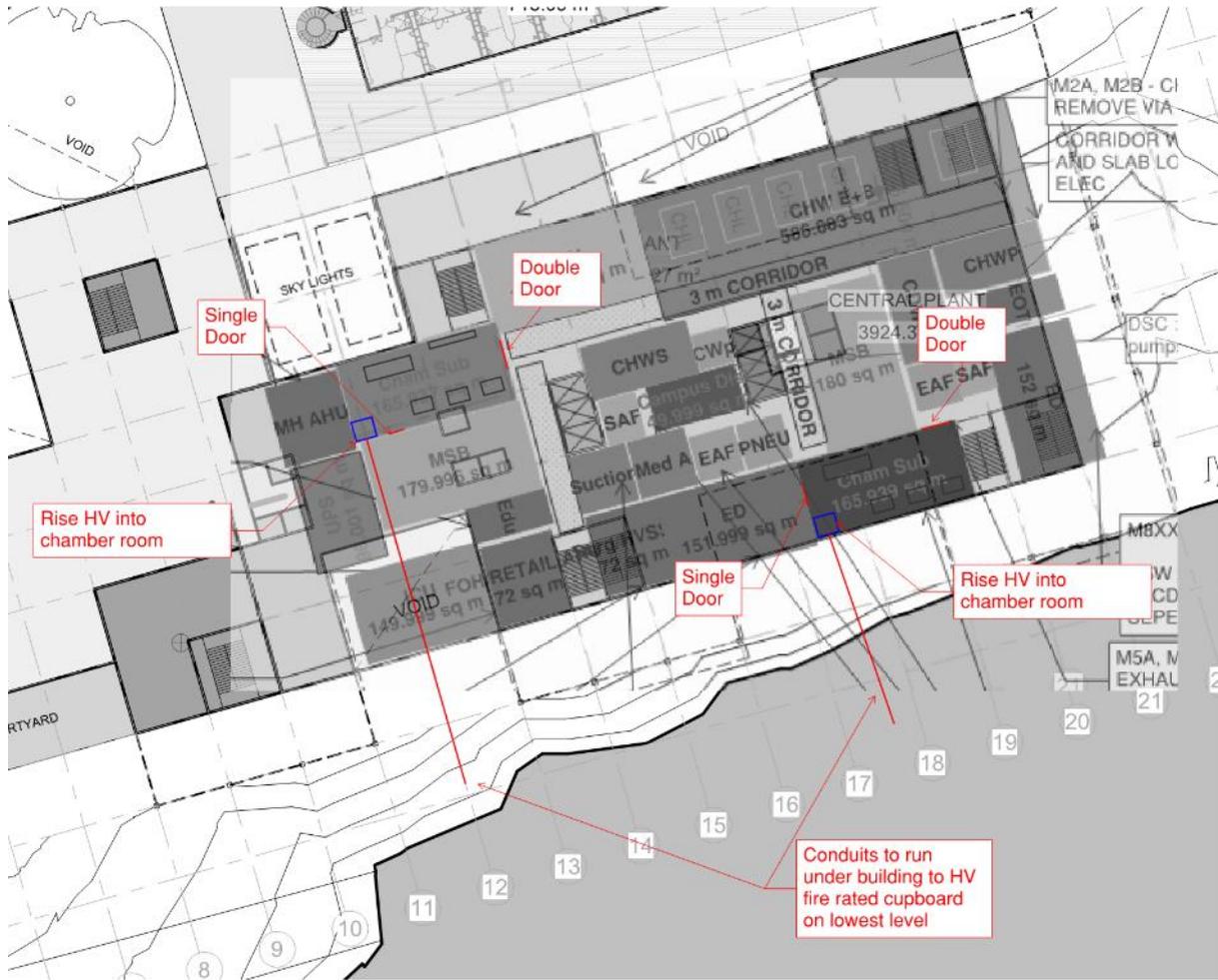
Proposed HV Reticulation Layout

The proposed location for the new chamber substation has been carefully determined with the following considerations:

- Access to the chamber substation for maintenance will be via a common service podium and craning
- Minimising impacts to the building via selected HV cabling routes and risers
- Minimisation of overall electrical costs by strategic placement of assets to minimise HV and LV cabling.

The overall internal dimensional footprint of the single chamber substation is 18m x 9m x 4m (approx. 162m²). The substations will be dry type with transformers that do not contain oil. Each chamber will have two paths of egress and be construction to an FRL of not less than 120/120/120, in accordance with AS2067.

Cables will reticulate through the building via fire rated HV risers and cupboards. Cables will enter the building underground via a pit and duct system, interfacing with the cupboards.



Substation Spatials

APPENDIX A – ENDEAVOUR CORRESPONDENCE

Brenton Burrows

From: David Ho <David.Ho@endeavourenergy.com.au>
Sent: Friday, 17 November 2017 11:28 AM
To: Brenton Burrows
Subject: RE: Campbelltown Hospital - HVC 13121

Hi Brenton,

Subsequent to my further investigation, CB CT1280 load actually included the loads of Campbelltown Hospital, Auxiliary TX and injection from AFIC cell 1A.

Daily peak on CB CT1280 was 120A last week. Summer peak load of CB CT1280 had reached 170A in last Jan/Feb.

I haven't looked into the actual load of Campbelltown Hospital, moreover a new 11kV feeder is definitely required to supply your additional load because the maximum deliverable load of a 11kV feeder is 240A (4.5MVA).

Regards,
David

From: Brenton Burrows [mailto:Brenton.Burrows@jhaengineers.com.au]
Sent: Thursday, 16 November 2017 3:06 PM
To: David Ho
Subject: RE: Campbelltown Hospital - HVC 13121

Thanks David – right so that item is internal to the zone sub, no wonder I couldn't find it.

Can't give any hints with regards to feeder capacity and existing HV loads?

Kind Regards,

Brenton BURROWS CPEng MIEAust NER RPEQ
Associate



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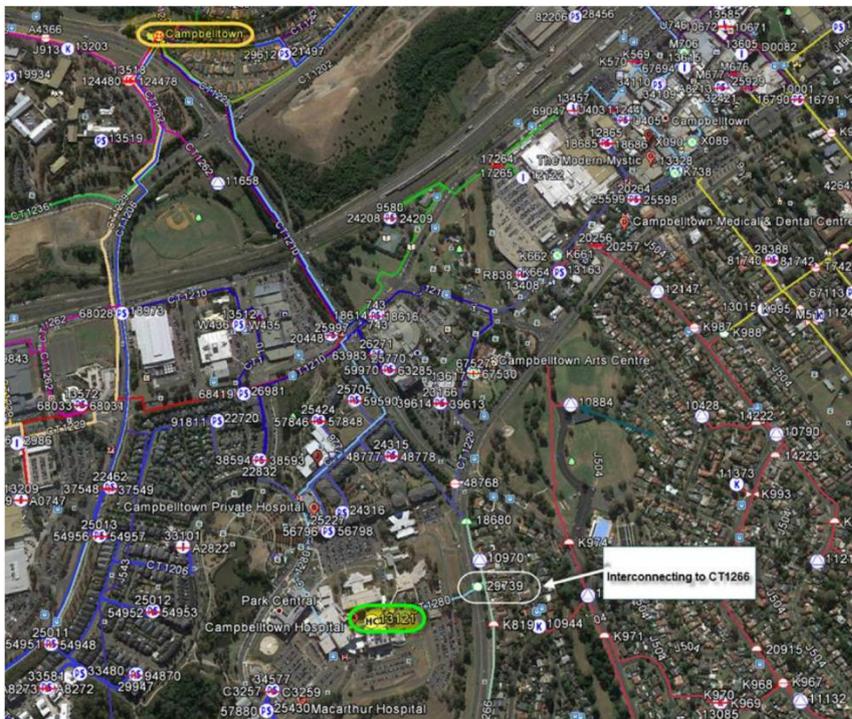
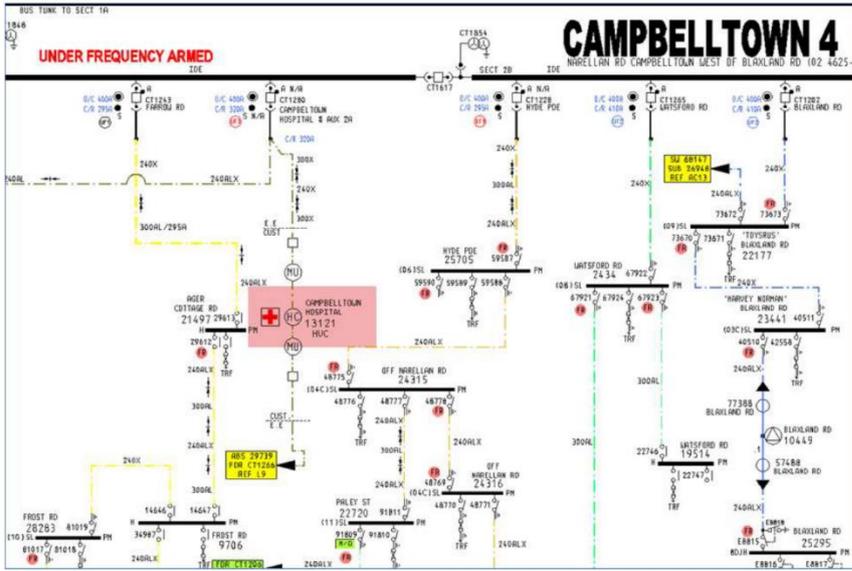
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From: David Ho [mailto:David.Ho@endeavourenergy.com.au]
Sent: Thursday, 16 November 2017 2:56 PM
To: Brenton Burrows <Brenton.Burrows@jhaengineers.com.au>
Subject: RE: Campbelltown Hospital - HVC 13121

Hi Brenton,

Presently Campbelltown Hospital (HVC 13121) is supplying from 11kV feeder CT1280 ex Campbelltown ZS Bus Section 2A and interconnecting to backup 11kV feeder CT1266 Campbelltown ZS bus Section 1B. CB CT1280 is doubling up with another 11kV feeder (AUX 2A) to supply local auxiliary transformer inside Campbelltown ZS (transformer load is almost neglectable).



Regards,
 David Ho
 Contestable Works Project Manager | Network Connections | Asset Management
 Direct: (02) 9853 7901
 Email: david.ho@endeavourenergy.com.au

Brenton Burrows

From: Sandra Clarke <Sandra.Clarke@endeavourenergy.com.au> on behalf of assetnumbers <assetnumbers@endeavourenergy.com.au>
Sent: Tuesday, 21 November 2017 8:22 AM
To: Brenton Burrows
Subject: RE: ARP3351 - Asset Details - Substation 34577

Brenton

Reads are not available, but sub details are as follows:

The screenshot shows the 'Equipment Tracing (ENDEAVOUR ENERGY)' application window. The title bar includes 'EquipmentTracing', 'Action', 'Equipment', 'Edit', 'View', 'Tools', and 'Help'. Below the title bar is a toolbar with various icons. The main window area is divided into several sections:

- Equipment Reference:** DS34577
- Comp Code:** [Empty]
- Mod Code:** [Empty]
- Equipment Descriptions:** PARKSIDE CRES - CAMPBELLTOWN
- Tree View:** DSPAD1 > Transformer, TX POSITION 1
- Details Panel:**
 - Pref Equip/EGT: [Empty]
 - Eq Equipment Reference: TX49007-01
 - Descriptions: WILSONTR 1000KVA PADMOUNT TRANSFORMER
 - Fitment Date: 1/04/2016
 - Reference Number: NEW RE
 - Cumulative Statistic: [Empty]
 - Position Statistic: [Empty]
 - Exp Btwn Rebuild: [Empty]
 - Life Since Rebuild/New: [Empty]
 - Remaining Life: [Empty]
 - Exp Ovrhl/Repl Date: [Empty]

Regards,

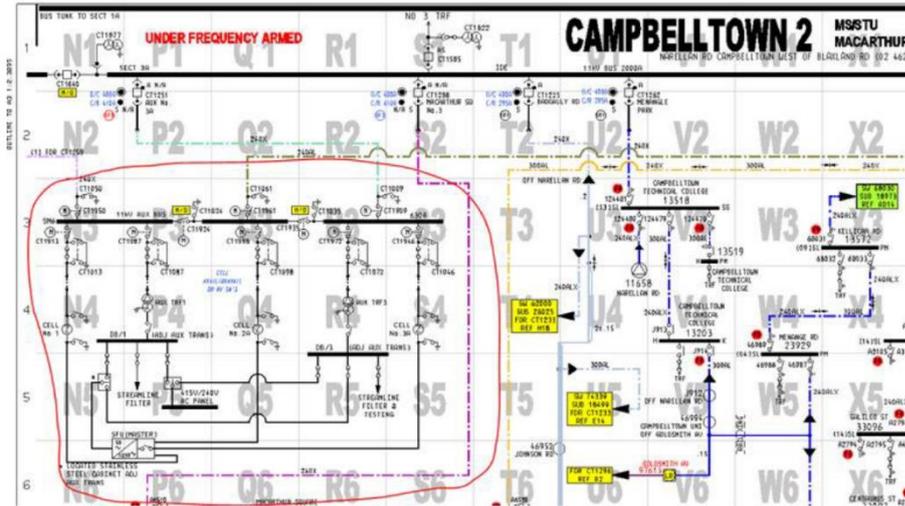
From: Brenton Burrows [mailto:Brenton.Burrows@jhaengineers.com.au]
Sent: Thursday, 16 November 2017 1:25 PM
To: David Ho
Subject: Campbelltown Hospital - HVC 13121

Hi David,

JHA have just been appointed Electrical and ASP3 engineers for a new clinical services building at Campbelltown Hospital. We are just starting concept design phase and are putting together options for the client with regards to building sizes and power requirements.

I've noted from GIS and SOPS that the hospital is private HV customer from HVC 13121. It is also fed from Campbelltown Zone, switches CT1280 and CT1266. We are trying ascertain spare capacities in both existing HV feeders supplying the site. **At this stage we are looking to increase load by around 5MVA** but this is somewhat fluid at the moment as we are in early concept stage and are trying to understand constraints around existing capacity. Any help you could give would really appreciated.

Also I noted below is SOPS hanging from CT1280 that is being shared by the hospital feeder. I can't seem to find in geographically in GIS. Could let me know what it is?



Thanks in advance.

Kind Regards,

Brenton Burrows CPEng MIEAust NER RPEQ
Associate



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