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UTILITIES AND SERVICES STRATEGY

Campbell's Stores

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Electrical Services Return Brief

Revision Schedule

Date	Rev	Amendments	Prepared By	Approved By
26.08.15	1	Draft	GL / SP	-
01.09.15	2	Draft	GL / SP	-
19.10.16	3	Draft	GL / SB	

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1. INTRODUCTION

Northrop has been asked by the client to prepare for the client' SEAR's report for the Campbell's Stores development project.

The report has been prepared for SEAR's item 12 outlining the details of hydraulic and electrical services infrastructure proposed to service the development. The report also details the existing infrastructure on-site, identifies possible impacts on infrastructure arising from the construction of the proposed works and proposes mitigation works.

2. ELECTRICAL AND COMMUNICATIONS SERVICES

2.1 EXISTING INFRASTRUCTURE

2.1.1 POWER SUPPLY

Incoming Supply

The site supply is fed from the direct distributor no. 2 from the existing substation no. S7999 located at 8 Hickson road. The substation feeds thirteen different sites located in George Street and Hickson Road including Campbell’s Stores. It appears that the site supply is 1200A per phase.

Service mains

The service mains appear to be 2 x 4 x 1c 630mm2 (Cu) PVC/PVC) and reticulates in underground conduits from the substation to the cable access room then to the Link box located at high level, near the cable entry point. The link box is rated at 1200A/phase.

Figure 3.1 – Service mains entry point

Figure 3.2 – 1200A Link Box

Consumer mains

The consumer mains originate from the link box and reticulate on cable trays through the service corridor up to the main switch room located in Bay 5.

Electrical and communications cables run on horizontal cable trays on wall along the entire length of the service corridors.

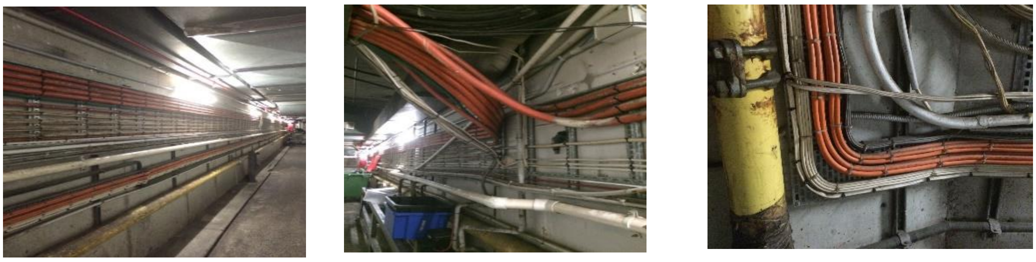


Figure 3.3 – Consumer mains and submains on cable trays

2.1.2 EXISTING MAIN SWITCHBOARD (MSB) & DISTRIBUTION BOARDS

The MSB is located in a dedicated room in Bay 5 lower ground floor and feeds unmetered tenancies and house services from this point. The MSB is approximately 11 years old, does not fully comply with the current Australian standards and NSW Service and Installation Rules.

The MSB is rated at 1200A and feeds all the tenancies

There are two more main distribution boards, one is located near loading dock and another one is located adjacent to HV cable access room. Tenancies are provided with dedicated DB's located either in the service corridor or within the Tenancy.

The house services supply authority meter is located within the main switchroom.

Figure 3.4 – Existing main switchboards and distribution boards

2.1.3 EXISTING COMMUNICATIONS SERVICES

Incoming Supply/MDF

200 Pair incoming Telstra lead-in cable terminates on to a floor mounted telecommunications main distribution frames (MDF) located in the service corridor. Each tenancy has its own dedicated intermediate telephone distribution frame located within the tenancy.

Figure 3.5 – MDF

2.1.4 EXISTING FIRE DETECTION AND ALARM SYSTEM

An addressable smoke detection and building occupant warning system is installed throughout the site. The main fire indicator panel is located in the loading dock.

Figure 3.6 – Fire indicator panel

2.2 PROPOSED INFRASTRUCTURE

2.2.1 POWER SUPPLY

Maximum Demand

Northrop has undertaken a preliminary maximum demand assessment based on AS/NZS 3000 Table C3. The preliminary overall demand for bays 1 to 11 will be as follows:

Dist. Group	Load Description	Area (m^2)	Load per m^2 (VA)	Load for whole area (kVA)	Load (A/Phase)
	Bay 12				
	Amenities	100	15	1500	2.2
	Ground Floor				
	Cool room	130	200	26000	37.5
	Plant	52	5	260	0.4
	Storage	44	5	220	0.3
	Loading dock	200	5	1000	1.4
	Corridor	130	5	650	0.9
	Amenities	113	15	1695	2.4
	Level 1				
	Amenities	90	15	1350	1.9
	Circulation areas	200	20	4000	5.8
	Level 2				
	Amenities	90	15	1350	1.9
	Circulation areas	200	20	4000	5.8
	Exterior	1090	5	5450	7.9
	Tenancy				
	7 x Tenancy @60A/phase				420.0
	6 x Tenancy @100A/phase				600.0
	Others				
	Lifts (3 off)	30, 3 phase			75
	Mechanical Load				436
	Totals	**2439.0**		**47475.0**	**1599.5**

Total Maximum Demand : 1599.5 A/phase

From the calculated maximum demand, it is envisaged that the existing site power supply is inadequate to accommodate the new power demands. We are currently awaiting assessment from Ausgrid as to the required supply requirements to accommodate for this demand.

Ausgrid have advised that a response is expected by 20/10/16, however due to the complexity of the project this date is an extension from the associated 10-day time period (from application date) to a 24-day turnaround. As such, Ausgrid have reserved the right to provide notice of additional time requirements to assess the project.

Consumer mains

New consumer mains cables will be installed from the existing substation (or Ausgrid proposed connection point) to a new main switchboard (MSB) located within the main switchroom.

Main Switchboard
A new main switchboard (MSB) complete with a service protection device will be established within a new main switch room on the ground floor. The new switchboard will feed power to several tenancies from one location reducing the number of switchboards compared to the existing installation.

Main Distribution Boards
A main distribution board (MDB 1) will be established within the main switch room on the Ground Floor providing power to Bays 9 to 11 tenancies.

A main distribution board (MDB 2) will be established midway in the service corridor on the Ground Floor providing power Bays 5 to 8 tenancies.

A main distribution board (MDB 3) will be established at the western end of the building in the service corridor on the Ground Floor providing power to Bays X, 1 to 4 tenancies.

The major difference with the proposed configuration is that no switchboards are located on the tenant floors, which increase the NLA.

Embedded network metering
Embedded network metering will be provided. Tenants will be fed through a single supply point such as a main switch board (MSB). A parent meter will be installed between the incoming supply and the MSB to record all incoming supply to the building. The site owner will then purchase electricity at the parent meter, as a large market user, and on-sells this energy to tenants at small market rates.

Power Distribution and reticulation
All existing electrical infrastructure including consumer mains, submains, main switchboards, distribution boards, sub-circuits cabling, cable trays etc. will be disconnected and removed due to non-compliance, age and unreliability.

New submain cables will be reticulated via horizontal cable trays mounted on wall along the services corridors and via underground conduits.

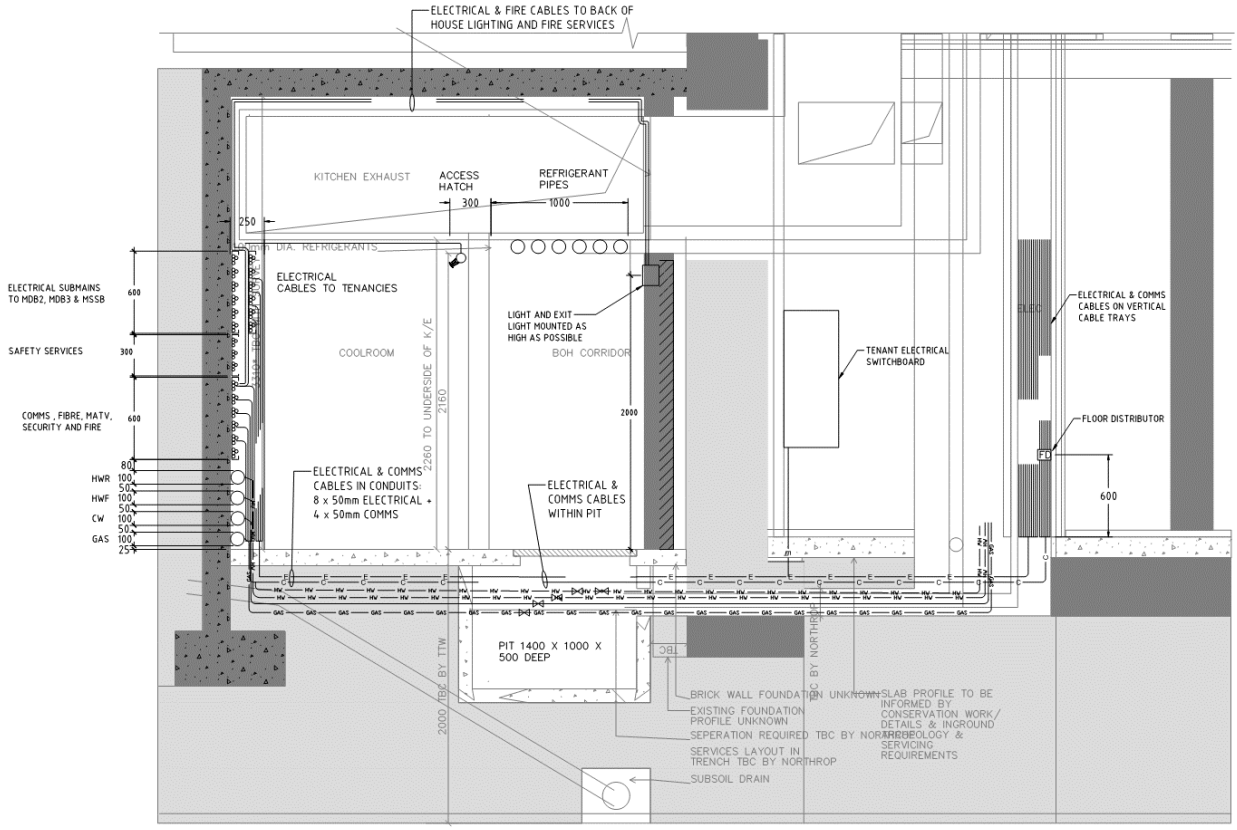


Figure 2.8– Cable Reticulation

Tenants will be fed from main distribution boards via following reticulation options:

- Tenants services cables will originate from the main distribution board, run on horizontal and vertical cable trays mounted on the back wall;
- Penetrate at floor level, run in underground conduits across the corridor and rise up at an allocated service riser location;
- Each bay will be provided with a service riser (450 x 450) from the ground floor to level 2 for vertical reticulation.

Electrical and communications cables will be reticulated within the tenancy space in such a manner that no cables will be mounted on any heritage fabric. Cables will be concealed from view and cable trays will be provided for future tenant fit out works.

Separate circuits will be provided for mechanical, hydraulic plant and equipment. Mechanical condenser units will be supplied with power connection from the nearest house distribution board. Mechanical and Hydraulic plants will be provided with dedicated circuits as per their service requirements.

2.2.2 VOICE / DATA COMMUNICATION

New 100 pair lead-in cable will be reticulated from the nearest Telstra pit to a new main distribution frame located in a dedicated communication room in the ground floor. The room will also house MATV head-ends, security and access control equipment etc.

Each Tenant will be provided with 10 pair floor distribution frame located within the services riser and to provide voice and data services.

Smart TV such as Apple TV will be provided in order to avoid installation of Free to Air and Foxtel antennae. Such TV's will provide streaming services including "Video on demand" and live streaming of Australian Free to air TV channels via the internet.

2.2.3 FIRE DETECTION AND ALARM SYSTEM

A new addressable FIP will be established at the Bay X and a mimic panel at level 2 Bay 6 main entry as per the BCA consultant's report.

Addressable smoke / thermal detectors will be installed throughout the building in accordance with BCA E2.2a and AS1670.1 requirements.

Hard wired building occupant warning system will be installed throughout the building.

2.2.4 INTERNAL LIGHTING

Artificial lighting for cold shell will be designed in accordance with BCA and AS1680. All internal areas will have a warm white colour temperature of 3000K.

Luminaire types, control and adopted minimum lux level will be as follows:

Area	**Luminaire Type, Control and Adopted Minimum Lighting Level (lux)**
Service Corridor	LED ceiling lights controlled via motion detectors 100 lux
Loading Dock	LED ceiling lights controlled via motion detectors 240 lux
Tenancy	LED track lights controlled via a local light switch 20 lux for base building
Amenities	LED downlights / Surface lights / Vanity lights controlled via motion sensors 150 lux 300 lux (at basin / mirror)

2.2.5 EMERGENCY AND EXIT LIGHTING

Emergency and exit lighting shall be distributed throughout all circulation areas to comply with the requirements of AS2293 and the BCA.

A Light Emitting Diode (LED) lamp type of Exit luminaire is to be introduced throughout the facility to reduce the ongoing maintenance. All LED fittings are provided with minimum 5 year warranties.

3. HYDRAULICS SERVICES

3.1 EXISTING INFRASTRUCTURE

3.1.1 EXISTING SYDNEY WATER SEWER SUPPLY

The development has access to the following Sydney Water sewer mains.

Currently there is a 300mm sewer main located on the eastern side of the building which currently serves the existing building. There are number of existing sewer manholes which are located within the existing external seating area. These will need to be adjusted to accommodate the new levels.

Currently there is sewer main in Hickson Road which the existing site does not connect into.

3.1.2 EXISTING SYDNEY WATER POTABLE WATER SUPPLY

The development fronts the following Sydney Water Mains.

An existing DN 150 CICL water main located along Circular Quay West on the eastern side of the building, approximately 3m from the building.

An existing DN 150 DICL Water Main located in Hickson Road.

Figure 3.1 – Sydney Water sewer manhole and hydrant within external seating area

3.1.3 EXISTING SYDNEY STORMWATER SUPPLY

At the eastern side of the building site storm water discharges directly into the harbour. For references refer to civil component.

3.1.4 EXISTING JEMENA GAS SUPPLY

The site is fronted by existing gas mains:

Existing 75mm @ 7 kPa located within the building existing service corridor (low pressure main). Main to be relocated at high level.

Existing75mm @ 7 kpa located within Hickson Road (opposite side of the road). No connection of this main.

Figure 3.2 – Existing gas main within service corridor

3.2 PROPOSED INFRASTRUCTURE

3.2.1 SYDNEY WATER SEWER & WATER SUPPLY

The existing Sydney Water sewer and water main along Circular Quay West on the eastern side (foreshore side) will remain to service the existing site. No anticipated upgrades however a section 73 application would need to be undertaken once the DA documents have been approved. A new water connection will be undertaken near the loading dock for fire services, with a brigade booster and the domestic water meter placed outside the southern wall of loading dock in landscape strip. Water supply will be sized to ensure to meet the demand for the proposed new works.

Existing sewer connection points will be utilised where possible with additional connection points added to suit new works.

The proposed new awning to be erected along the buildings eastern façade will require significant structural detail to avoid any direct impact or zone of influence to the surrounding Sydney Water assets, in accordance with 'Guidelines for Building Over/ Adjacent to Sydney Water and Waste Water Assets.

All excavation where the proposed works are within a distance equivalent to twice the depth of the Sydney Water existing assets must have the assets accurately plotted on the plan. A Service Protection Report is required to be undertaken by a Registered Surveyor to locate and peg/ mark Sydney Water assets. The peg/ marks must remain in place and unaltered until all works are completed. It is recommended that the Service Protection Report been done during the detailed survey works.

A Water Servicing Coordinator (WSC) is to be engage to document and project manage any alteration and or adjustments to the Sydney Water assets. Structural engineering plans are required for the excavation and must show Sydney Water's existing and proposed assets on plan and cross sections, in accordance with the plan. The structural plans must be produce in accordance with the specifications in 'Guidelines for Building Over/ Adjacent to Sydney Water Water and Wastewater Assets' which can be download from http://www.sydneywater.com.au. The structural plans detailing Sydney Water asset protection are to be submitted to a WSC for review and approval.

3.2.2 JEMENA SUPPLY

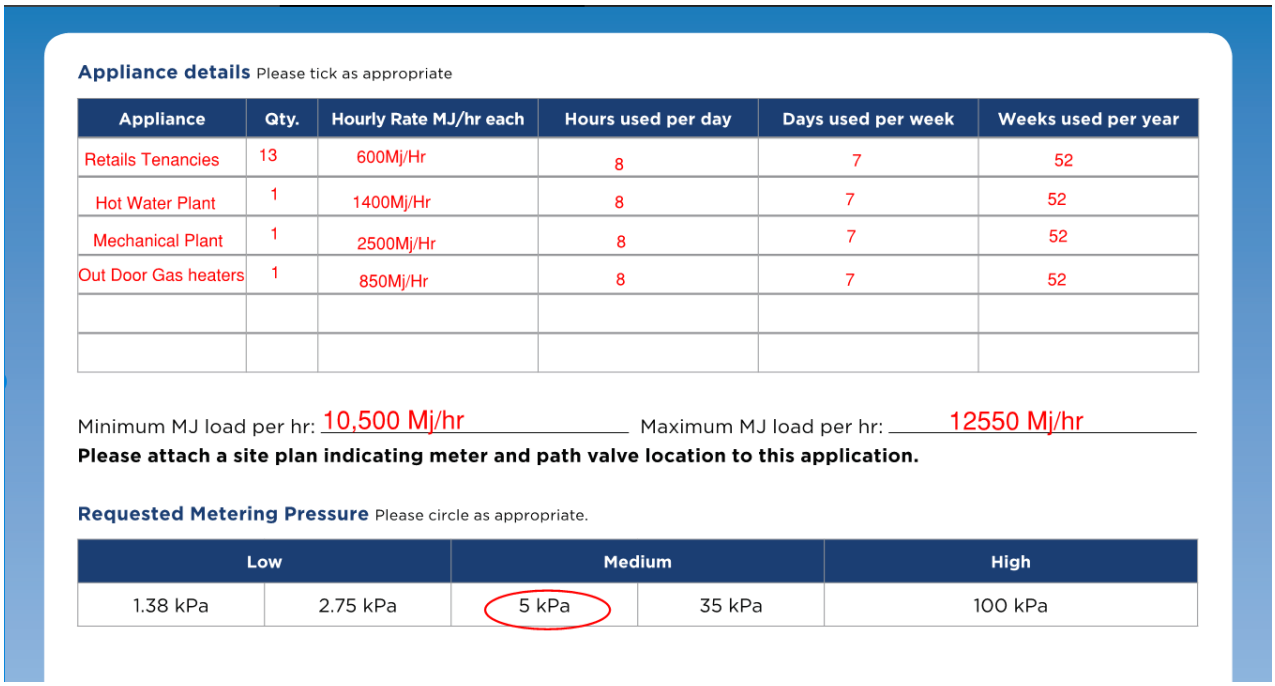
An application has been lodge with Jemena for new connection and metering services for the proposed upgrade works within the Campbell's Store Redevelopment, with an anticipated approval in writing to be received in late November 2016.

From meetings and discussions held with Jemena to date, it is proposed that the existing authority gas main presently located within the services corridor at the rear of site bordering Hickson Road, is to be removed and omitted. Prior to Jemena's final approval for the removal of asset, the client is to confirm that this existing authority main is not serving any neighbouring or surrounding sites external of Campbell's Store. Additional investigation is to be undertaken to confirm no connections in neighbouring properties.

Once the existing authority gas main is removed a new consumer piping network is to be reticulated from the rear of the loading dock to supply individual tenancies within Campbell's Store. Each tenancy is to be individually metered and data cable provided in accordance with Jemena's MDL metering guidelines and a master MDL is to be located within the loading dock adjacent to the new boundary regulator/ meter.

The Builder is to arrange for a dedicated phone line and number with Telstra. The phone line should be positioned adjacent to the bottom left of the Master MDL and terminated with a 6 position modular jack (RJ12) and min 500mm of Cable. The works must be installed in accordance with Jemena requirements.

The new consumer gas main will be sized to meet with required gas loads to supply the proposed new works and based on the anticipate loads to be drawn once the development is occupied. Below is an extract from the application submitted to Jemena nominating the assumed gas load to be drawn.



Appliance details Please tick as appropriate

Appliance	Qty.	Hourly Rate MJ/hr each	Hours used per day	Days used per week	Weeks used per year
Retails Tenancies	13	600Mj/Hr	8	7	52
Hot Water Plant	1	1400Mj/Hr	8	7	52
Mechanical Plant	1	2500Mj/Hr	8	7	52
Out Door Gas heaters	1	850Mj/Hr	8	7	52

Minimum MJ load per hr: 10,500 Mj/hr Maximum MJ load per hr: 12550 Mj/hr

Please attach a site plan indicating meter and path valve location to this application.

Requested Metering Pressure Please circle as appropriate.

Low		Medium		High
1.38 kPa	2.75 kPa	5 kPa	35 kPa	100 kPa

Figure 3.3 – Extract from Gas application submitted to Jemena for anticipated gas loads.