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UTILITIES AND SERVICES STRATEGY

Campbell's Stores

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Electrical Services Return Brief

Revision Schedule

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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.

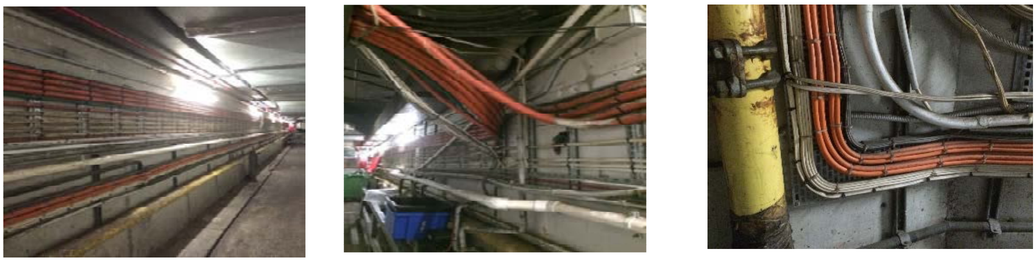

Figure 3.3 – Consumer mains and submains on cable trays

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:

Level	Area	VA/m2	VA	Amps
Lower Ground	1255	250	313750	452.9
Lower Ground BOH & Storage	510	20	10200	14.7
Amenities	273	50	13650	19.7
Upper Ground	1376	150	206400	297.9
Level 1	1504	125	188000	271.4
Level 2	179	50	8950	12.9
Exterior	1366	10	13660	19.7
Total	6463		754610	1089.2
Lifts (4 off)	35, 3 phase			105
Total Max Demand				1194.2

Total Maximum Demand : 1194.2 A/phase

From the calculated maximum demand, it is envisaged that the existing site power supply is adequate to accommodate the new power demands.

Ausgrid has already approved utilising existing 1200A/phase power supply to Bays 1 to 11 and has also approved 150A/phase dedicated power supply to Bay 12.

Service mains

Existing incoming authority cables will be retained and a new link box will be located inside the new main switchroom.

Consumer mains

New consumer mains cables will be installed from the link box to a new main switchboard (MSB) located within the main switchroom. New cables will be 2 x 4 x 1c 630mm² Cu / XLPE/ PVC to match with the existing service mains.

Main Switchboard
A new main switchboard (MSB) complete with a service protection device will be established within a new main switch room on lower ground floor. The room will be located at the proximity to the main cables entry point in order to avoid impact on the existing major fabric.

The new switchboard will feed power to several tenancies from one location and reduce the number of switchboards compared to the existing installation.

Main Distribution Boards
A main distribution board (MDB 2) will be established midway in the service corridor on Lower Ground Floor providing power to a 6 tenancies.

Another main distribution board (MDB 3) will be established at the western end of the building in the service corridor on Lower Ground Floor providing power to another 6 tenancies.

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

Metering Panel
One off NMI approved branch feeder monitor like SATEC BFM136 will be installed in the main switchroom. One such meter will monitor power up to twelve (12) tenancies with three phase power supplies and thirty-six (36) tenancies with single phase power supplies.

Tenants will receive electricity bills from the Building manager. The implementation of such meters will save huge space.

Figure 3.7– SATEC BFM136

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 suspended cable trays fixed under mechanical ducts along the services corridors.

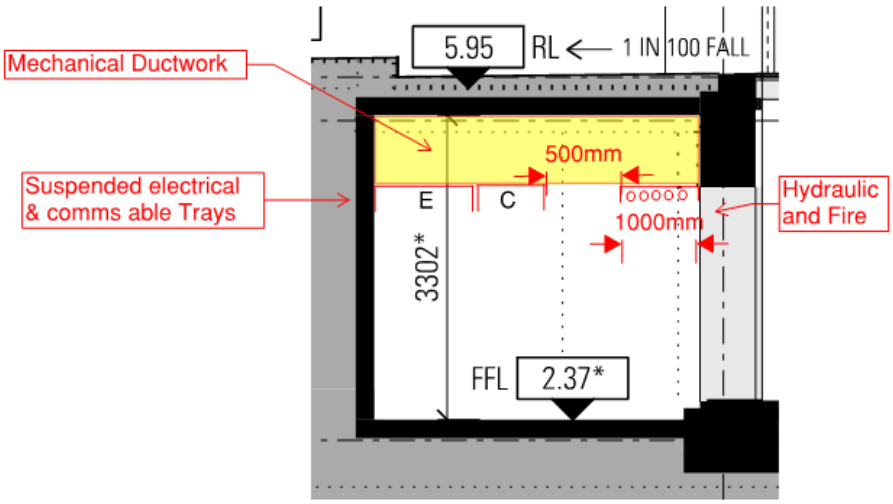

Figure 2.8– Cable Reticulation

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

- Tenants services cables will be originated from the main distribution board and rise up on vertical cable trays.
- Penetrate at high level in service corridor.
- Each bay will be provided with a service riser (450 x 450) from lower ground level to top for vertical reticulation.
- For ground floor tenancies, cables will be reticulated under floor space where available.

Electrical and communications cables will be reticulated within the tenancy space in a manner sensitive to heritage fabric (part of the tenant fit out).

Separate circuits will be provided for mechanical, hydraulic plant and equipment. Mechanical condenser units will be supplied with power connection from the nearest 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 lower ground floor.

The room will also house communication rack units to provide voice and data services to tenancies, MATV head-end, security and access control equipment etc.

Wireless network will be implemented throughout in order to meet the current wireless trend.

Cable television system will be provided in order to avoid installing roof mounted antennas.

2.2.3 FIRE DETECTION AND ALARM SYSTEM

A new addressable FIP will be established at the Bay 6 main entry as per the BCA consultant's report.

In order to avoid reticulation of cables and hence impact on building fabrics, a wireless fire detection system will be installed. Wireless type 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 and override local switch 100 lux
Loading Dock	LED ceiling lights Controlled via motion detectors and override local switch 240 lux
Tenancy	LED ceiling lights / Pendants controlled via pull cord 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.

2.3 BAY 12

Bay 12 will be treated as a separate building and dedicated power and communications services will be provided to service the building.

Consumer mains

New consumer mains cable will be reticulated in underground conduit from the existing electrical pit # 50037 as per Ausgrid recommendation and terminated on to a new main switchboard located in a dedicated main switchroom in the lower ground floor.

Main Switchboard

The main switchboard will feed all Bay 12 tenancies from this point. The switchboard will be equipped with a service protection device and sections for unmetered and house services. An NMI approved Branch Feeder Monitor like SATEC BFM136 will be installed adjacent to the main switchboard to monitor actual power consumption of each tenant.

Voice / data Communication

New 20 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 lower ground floor. The room will also house a communication rack unit to provide voice and data services to tenancies, MATV head-end, security and access control equipment etc.

Fire detection and Alarm System

Fire detection and occupant warning system will be provided throughout the building in accordance with BCA E2.2a and AS1670.1 requirements.

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 adjusted is levels are amended.

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 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 stormwater 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 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 and meter placed outside the southern wall of loading wall 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.

3.2.2 JEMENA SUPPLY

The existing gas main within corridor to be relocated from the rear wall and fixed to underside of existing slab above. The works will need to be installed in accordance with Jemena requirements.

The new relocated gas main will be sized to meet with required gas loads to supply the proposed new works.