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**Marrickville Metro**

**Electrical Services**
**Concept Design Report**
21 May 2010.
Revision C
Alex McBurney
Lend Lease design

**Hydraulic Services**
**Concept Design Report**
21 May 2010
Revision C
Chris Rust
Lend Lease design

# ELECTRICAL SERVICES

## ENERGY AUSTRALIA ZONE SUBSTATION CAPACITY

Current zone substation capacity and loading is published on the Energy Australia website. Marrickville Zone Substation has a capacity of approximately 119MVA. Records indicate that it is currently loaded to 79MVA with little growth projected over the next 5 years. Therefore we believe that zone substation capacity is unlikely to be a constraint on this project.

Energy Australia has been notified of the project but has not yet responded to our request for a preliminary method of supply.

## FORMER INDUSTRIAL SITE

### 1. AUTHORITIES

Note: All work noted in association with Authorities is subject to negotiation with them as the design develops.

### Power

**Overhead Services**
Overhead electricity services are located around the site as follows:

- Murray St: : low voltage and streetlighting services on poles on the east (far) side of the street
- Edinburgh Rd: low voltage and streetlighting on the southern (far) side of the site between Murray St and Sydney Steel Rd; dual circuit low voltage and streetlighting on the northern (our) side between Sydney Steel Rd and Smidmore St.

It is proposed to keep all overhead services unaltered as far as possible. It may be a requirement to underground the low voltage services in Edinburgh Rd where they are located on the north side of the street.

**Substations**
An outdoor substation (No 1752/9981) is located on the industrial site near the corner of Edinburgh Rd and Murray St. This will be de-commissioned.

To service the new extension on the former industrial site, it is proposed to establish a new 2 transformer indoor substation. It will contain 1 x 1500kVA and 1 x 1000kVA transformer. It is proposed to locate the substation adjacent to the loading dock area off Edinburgh Rd. High voltage cabling will run to the new substation in underground conduits from the street.

**Telecommunications**

Manholes for underground telco services noted as follows:
- Murray St in footpath (our side of street - major run)
- Smidmore St in footpath as well as on south side of street adjacent Murray St intersection
- Edinburgh Rd manhole adjacent intersection with Smidmore St

It is likely that relocation of a manhole will be required at the corner of Smidmore St and Edinburgh Rd to accommodate the new roundabout.

## 2. MAIN SWITCHROOM

A main switchroom will be established adjacent to the new substation to service the new extension to the centre. The main switchroom will be approximately 12mL x 7mW x 3.5mH

## 3. DISTRIBUTION BOARDS AND METERING

Node rooms will be established in back of house areas to service specialty shops and malls. Node rooms will contain:
- House services distribution boards
- Tenant services distribution panels
- Tenant metering
- Telecommunications floor distributor frames
- Miscellaneous security, BMCS, emergency lighting etc panels
- Space for future communications rack

One node room of approximately 30m$^2$ (6mL x 5mW x 3mH) will be established for every 20 specialty shops.

Lockable distribution boards will be provided in carpark areas.

House services will be metered in the main switchroom. Check metering will be provided on the main switchboard, mechanical plant and some distribution boards to allow apportionment of running costs to tenants.

## 4. TELECOMMUNICATIONS

A Building Distributor room will be established on the former industrial site to serve the new specialty shops and mall. This will be independent of the MDF in the existing centre. It will be located in the loading dock area. It will be approximately 20m$^2$.

Floor Distributor frames will be established in each node room. From here, 2 x 4pair Cat 6 copper cables will be provided to service each specialty shop.

### 5. SUBMAINS

Submains to specialty shops will be provided as follows:

- Non-food shops: 80 amps single phase
- Food shops: 100Amps 3 phase
- Mini-majors, majors: As per their respective Lessor works specification.

## EXTENSIONS TO EXISTING CENTRE

### 1. AUTHORITIES

Note: All work noted in association with Authorities is subject to negotiation with them as the design develops.

### Power

#### Overhead Services

Overhead electricity services are located around the site as follows:

- Victoria Rd: low voltage and streetlighting services on poles on the north (far) side of the street
- Murray St: : low voltage and streetlighting services on poles on the east (far) side of the street
- Smidmore St: low voltage and streetlighting on poles on the north side of the street

It is proposed to keep all overhead services unaltered as far as possible. It may be a requirement to underground the low voltage services in Smidmore St where they are located on the north side of the street to accommodate the realignment of the kerb and shopfronts.

#### Substations

The existing site is fed from 3 incoming supplies

- LV from Kiosk No 2026 located off the site on the east side of Murray St
- LV from Kiosk No 7981 located on the site boundary on the west side of Murray St
- LV from Substation No 131 (indoor type) located adjacent to a dock area off Smidmore St

These will be retained unaltered. Particular care will be required in coordination of modifications to the retail fronting Smidmore St around the substation to maintain acceptable access, and on Murray St near the kiosk substation and consumers mains connections, which are located near to the proposed new carpark ramp.

To service the Level 1 extension, a new 1 x 1500kVA substation will be required. This may be an indoor type or a kiosk style substation. This would ideally be located off Murray St or Smidmore St. There will also be a re-distribution of load between the substations as part of the work.

**Telecommunications**

The MDF for the existing centre is located in a plant area off the dock on Smidmore St. Incoming cable comes underground along Smidmore St from Murray St.

Manholes for underground telco services noted as follows:

- Victoria Rd in footpath (our side of street)
- Murray St in footpath (our side of street - major run)
- Smidmore St in footpath (north side of street) as well as on south side of street adjacent Murray St intersection

Exisitng cable runs and manholes are proposed to be retained as far as possible. The re-alignment of the shopfronts on the Smidmore St frontage may necessitate the relocation of the incoming feed to the centre. The conduit run and associated manholes are expected to have to be relocated clear of the building alignment.

## 2. MAIN SWITCHROOM

A main switchroom will be established adjacent to the new substation to service the new extension to the centre. The main switchroom will be approximately 12mL x 5mW x 3.5mH

The existing main switchboards will be retained unaltered as far as possible. Some redistribution of load will be required to balance the load across the new and existing switchboards. This will require modifications to the switchboards and associated shutdowns of power to portions of the centre.

## 3. DISTRIBUTION BOARDS AND METERING

Existing distribution boards on the Ground floor will be retained as far as possible.

On the Ground floor, tenant revenue (Electricity Retailer) metering is currently located within the shops. This does not conform to current standards, and a significant re-mix will trigger the need to re-wire the tenant services to relocate the metering to central locations within the public areas in the centre. This usually means the establishment of node rooms or cupboards throughout the centre, which may result in a loss of lettable area.

In the Level 1 extension, node rooms will be established in back of house areas to service specialty shops and malls. Node rooms will contain:

- House services distribution boards
- Tenant services distribution panels
- Tenant metering
- Telecommunications floor distributor frames
- Miscellaneous security, BMCS, emergency lighting etc panels
- Space for future communications rack

One node room of approximately 30m$^2$ (6mL x 5mW x 3mH) will be established for every 20 specialty shops.

Lockable distribution boards will be provided in carpark areas.

House services will be metered in the main switchroom. Check metering will be provided on the new main switchboard, new mechanical plant and some distribution boards to allow apportionment of running costs to tenants. Check metering will not be installed on the existing main switchboards, mechanical plant or distribution boards.

## 4. TELECOMMUNICATIONS

The existing Building Distributor Room (formerly MDF room) will be retained. Extra services will be installed in the room to service the extensions.

Floor Distributor frames will be established in each node room. From here, 2 x 4pair Cat 6 copper cables will be provided to service each specialty shop.

## 5. SUBMAINS

Submains to existing shops on the ground floor will be retained as far as possible, subject to the requirement to re-wire the centre due to metering requirements (see above).

Submains to new specialty shops on Level 1 will be provided as follows:

- Non-food shops: 80 amps single phase
- Food shops: 100Amps 3 phase
- Mini-majors, majors: As per their respective Lessor works specification.

## 6. SECURITY/CCTV

The security room located on the ground floor of the existing centre will be retained. It will be utilised to service the entire centre. Additional equipment will be added to it to service the extensions.

## 7. EXTERIOR LIGHTING

The exterior lighting on the top deck carpark will be designed in accordance with AS1158 to ensure safe pedestrian and vehicle movements. Lighting will incorporate energy efficient metal halide lamps in full cut off pole mounted fixtures to minimise lighting spill from the development.

The lighting design will also conform to AS 4282 “Control of the Obtrusive Effects of Outdoor Lighting”. The performance of the lighting system will be modelled using computer modelling software to confirm conformance with the standard. Preliminary review of the plans indicates acceptable light spillage levels for surrounding residential areas in accordance with this AS code can be achieved.

Light spill from car headlights will be minimised by the incorporation of a concrete upstand in the carpark perimeter.

# HYDRAULIC SERVICES

## WATER SUPPLY

The Marrickville Metro existing shopping centre complex and proposed new expansion is serviced by Sydney Water Mains located in the street frontages in Smidmore Street, Murray Street Edinburgh Road and Victoria Road. These mains have adequate capacity to service the new expansion.

Sydney Water have advised in a feasibility letter dated 20th April the mains are suitable for connection and confirm the proposed connection location for the southern extension is the 150mm main in Edinburgh Road.

## WATER CONSUMPTION REDUCTION

Strategies will be implemented on site to significantly reduce the potable water consumption with the new and existing centre.

Water efficient fixtures will be installed in the centre amenities, including low flow timed tapware, minimum volume WC flush cisterns, and low flush urinals. Tenants within the building will be encouraged to install water saving tapware and adopt water minimisation strategies such as waterless woks.

Rainwater harvesting will be implemented within the new and expanded existing centre and non potable water reticulated through the centre for sanitary flushing, cooling water and irrigation. The rainwater will be collected from the roof carparks and treated to Class A quality recycled water. Preliminary calculations propose a 60 kL harvesting tank to the new southern extension and a 150-250 kL tank to the expanded existing centre that will achieve approximately 15% additional reduction in total water consumption, and reduce stormwater discharge from the site by approximately 45% reducing contaminant and nutrient load in the receiving water course. (Harvesting Tank Capacity to be confirmed during design development)

## SEWER DRAINAGE

The site is well serviced by Sydney Water sewer mains suitable for connection of the new southern extension. Sydney Water sewer assets cross the new extension site, and diversion and extension works will be required to relocate the sewer mains in accordance with Sydney Water requirements.

## GAS SUPPLY

The site is well services by Jemena Gas mains in the locality. There are secondary mains located in Murray Street and Edinburgh Street considered suitable for connection to the site with sufficient capacity for the new expansion requirements.