



IGS INTEGRATED
GROUP
SERVICES



ATP

Locomotive Building - Commercial Space Electrical Services Reverse Brief

Job Number: EN - N15_119

November 2017

Suite 1.11, 75 Mary Street
St Peters, NSW 2044
Phone: +61 2 8488 4600
Fax: +61 2 9475 4588
Email: admin@igs.com.au
Web: www.igs.com.au
 [linkedin.com/company/3213174](https://www.linkedin.com/company/3213174)
ABN: 68 163 019 029

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“Revised SSDA ISSUE”

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1. INTRODUCTION

1.1 General

This report supports a State Significant Development Application (SSDA) submitted to the Minister for Planning pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The Application (referred to as SSDA 8449) seeks approval for the adaptive reuse and redevelopment of the western portion of the Locomotive Workshop Building (being Bays 5-15) within Australian Technology Park (ATP), Eveleigh as described in the Project Description section of this report.

1.1 Background

Historically, ATP was used for railway maintenance, storage and other associated industries. Use of the site as marshalling yards and workshops formed part of a large railway-based precinct on both sides of the main railway line, dating from 1882 and growing in size until its closure in 1989. Since this time, the precinct has been progressively redeveloped and repurposed.

In 2014, the NSW Government resolved to offer development sites within the ATP for sale through a selective tender process conducted by Urban Growth NSW Development Corporation (UGDC). In November 2015 Mirvac Projects Pty Ltd (Mircvac) was named as the successful party and ownership and development rights of the precinct were subsequently transferred.

In December 2015, an SSDA was submitted to the Department of Planning & Environment for a multi-building redevelopment (i.e. Buildings 1, 2 and 3 shown in **Figure 2**) of the ATP to provide new commercial office, retail and community uses and a significant upgrade to the ATP public domain. Following public exhibition, and the submission of additional information, the development was approved by the Planning Assessment Commission on 20 December 2016. The construction of Buildings 1, 2 and 3 is currently underway.

The redevelopment of the Locomotive Workshop is also part of Mirvac's redevelopment strategy for the ATP. The Locomotive Workshop building is to be redeveloped in its entirety, however planning approvals are sought through the submission of two separate SSDAs. This Application relates to the western portion of the Building and is envisaged to be the next phase of urban regeneration within the ATP.

1.2 Site Location

The Locomotive Workshop is located within the Australian Technology Park (ATP), Eveleigh. The ATP precinct is located approximately 5km south of the Sydney CBD, 8km north of Sydney airport and within 200m of Redfern Railway Station and has an overall area of approximately 13.2 hectares. An aerial photograph of the ATP precinct is shown in **Figure 1** and the locational context of the Locomotive Workshop building is identified in **Figure 2**.



The ATP Precinct

Figure 1 – ATP Precinct

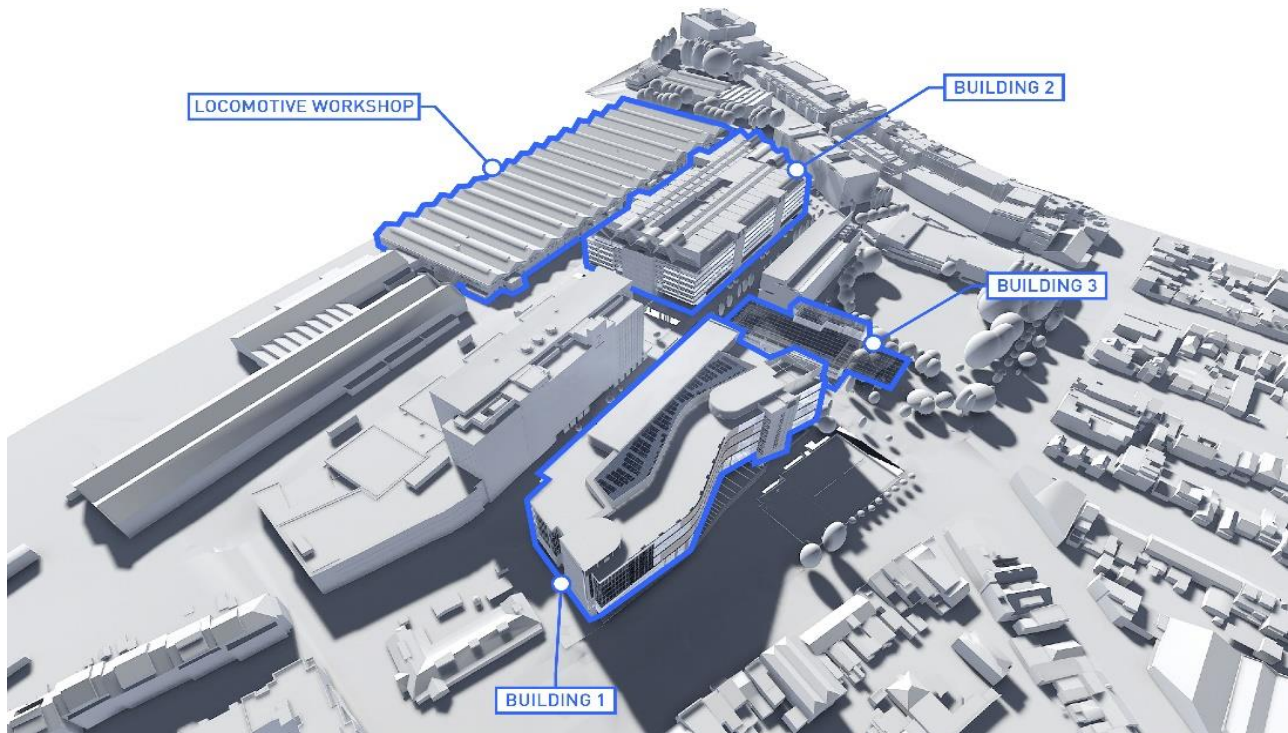


Figure 2 – Locational context of the Locomotive Workshop

1.3 Proposed Development Description

This SSDA seeks approval for the following:

- demolition of existing ‘modern’ infill fit-out elements to Bays 5-14 and 15;
- the adaptive reuse of the western portion of the Locomotive Workshop Building for ‘commercial premises’ uses including light industrial floorspace;
- construction of internal and external improvements to the Locomotive Workshop Building;
- heritage interpretation and conservation works;
- public domain improvements within the curtilage of the Building;
- provision of an external building illumination system;
- signage; and
- associated utilities and infrastructure.

A more detailed and comprehensive description of the proposal is contained in the EIS prepared by Ethos Urban.

1.4 BCA Classification

BCA classification(s) of the development are as follows:

BCA Classification	Class 5 Class 6 Class 9b	Commercial Retail Production studios, gym, function room, museum
Rise in Storeys	Building 1 Building 2 Building 3 Locomotive Workshops	8 6 3 2
Type of Construction	Commercial Space: Type A & C Construction Retail Space: Type B Construction	
Effective Height	Buildings 1 & 2 Building 3 Locomotive Workshop	Over 25m Under 25m Under 25m

1.5 Mandatory BCA Energy Efficiency Requirements

Mandatory BCA Energy Efficiency requirements are as follows:

- Part J1 – Building Fabric;
- Part J2 – External Glazing;
- Part J3 – Building Sealing;
- Part J5 – Air Conditioning and Ventilation;
- Part J6 – Lighting and Power;
- Part J7 – Hot Water Supply;
- Part J8 – Facilities for Energy Monitoring.

Additional Considerations:

- NABERS 5 Star;
- 5 Star Green Star;
- PCA A Grade.

IGS' proposed design will take into consideration the ESD targets of the project as per the ESD Consultant's ESD report.

2. UTILITY ENGINEERING SERVICES

2.1 Utilities Services Review / Analysis

2.1.1 Electrical

IGS has made contact with Ausgrid and have ascertained the following:

- There is approximately 10MVA of supply capacity available to the development from the St Peters Zone Substation within the ATP precinct;
- The 10MVA supply is not diverse and reticulates in the same trench to the site;
- The Zetland Zone Substation feeders within ATP are at capacity;
- The Locomotive Building is currently supplied from two (2) off existing Ausgrid chamber substations S.3507 and S.3512 which are fed from the St Peters Zone Substation (feeder 28);
- S.3507 has 2 x 1,500kVA transformers and currently supplies the building via two (2) off 3,000 A/phase supplies but has a firm rating of 2,900 A/phase. Ausgrid have confirmed that the chamber was designed for a maximum of two (2) transformers and there is no space to add an additional transformer. This substation is proposed to feed the new commercial space;
- S.3512 has 2 x 1,000kVA transformers and currently supplies the building via two (2) off 3,000 A/phase supplies but has a firm rating of 1,900 A/phase. This substation also has a 400A/phase supply to the National Innovation Centre building adjacent. Therefore, the available capacity to Locomotive is reduced to 1,500 A/phase. Ausgrid have confirmed that the chamber was designed for a maximum of two (2) transformers and there is no space to add an additional transformer. This substation is proposed to feed the new retail space;
- This brings our total (firm rated) capacity to 4,400 A/phase;
- In order to satisfy both the maximum demand for retail, a high power user tenant within the commercial space as well as the requirement to provide a HV open point for CBA's diverse feed requirements, we propose two (2) new 1,000kVA kiosk substation (S.77160 & another yet to be named) to supplement the existing substation capacity. These substations are proposed to be located on the grass verge adjacent the National Innovation Centre (refer below) and are subject to Ausgrid approval and final tenant loads;
- We are awaiting confirmation from Ausgrid that the Camperdown feed within the ATP has capacity to provide supply to these new kiosk substations. A formal Preliminary Investigation Application has been submitted to Ausgrid for their formal advice in regards to these additional kiosk substations. Ausgrid approval will be subject to overall network demand of the existing electrical infrastructure.

Ausgrid correspondence and relevant information to date are as follows:

Vince Nigro

From: Manuel Lopez <mlopez@ausgrid.com.au>
Sent: Tuesday, July 11, 2017 7:51 AM
To: Vince Nigro
Subject: Re: ATP - Building (Locomotive) Substation Supplies

Good Morning Vince

From Ausgrid records, S.3507 has two 3000A busbar supplies to the locomotive building. The substation has 2 x 1500kVA transformers. It is rated non-firm at 3996A.

S.3512 has two 3000A busbar supplies to the locomotive building and a 400A supply to National Innovation Centre. The substation has 2 x 1000kVA transformers. It is rated non-firm at 2974A.

Regards

Manuel Lopez

Project Coordinator / Contestable Connections Sydney East & CBD | [Network Connections](#)

Ausgrid:: Building 4 Level 1 , 130 Joynton Ave, Zetland NSW 2017
T: (02) 9663 9327 **M:** 0418 614 276
F: (02) 9663 9499 **E:** mlopez@ausgrid.com.au **W:** www.ausgrid.com.au

From: Vince Nigro <vince.nigro@igs.com.au>
To: Manuel Lopez <mlopez@ausgrid.com.au>
Date: 11/07/2017 07:41 AM
Subject: ATP - Building (Locomotive) Substation Supplies

Hi Manuel,

Just need some assistance.

We are currently working on concepts for Building 4 (Locomotive) within the ATP precinct. This is the existing large Locomotive Workshop on the site which Mirvac intend to refurbish.

We know there are two (2) existing substations on the site – S.3507 (2 x 1500kVA) & S.3512 (2 x 1000kVA).

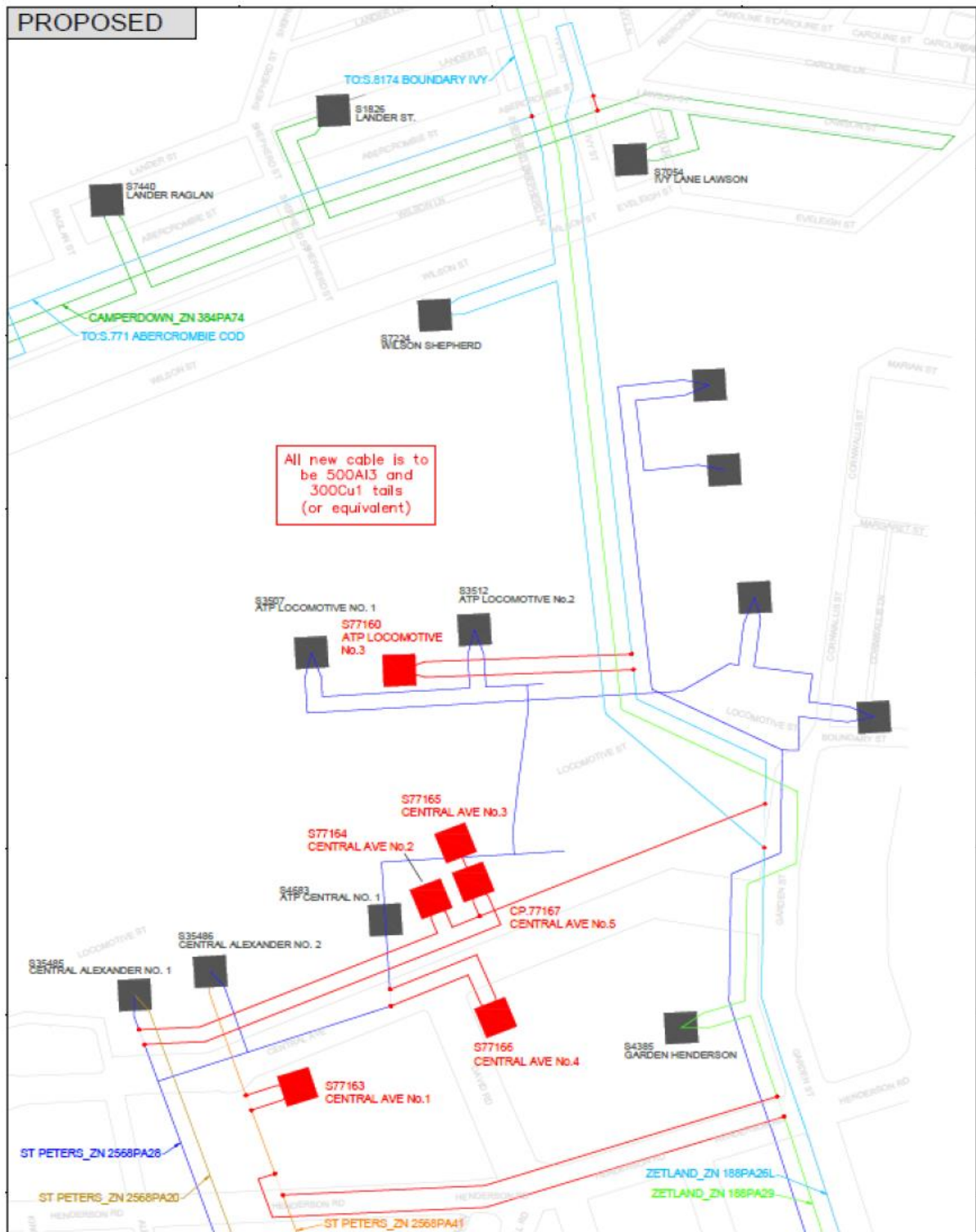
The GIS info does not tell us the size of the LV supplies coming out of the substations. On site I could see two (2) LV busducts coming out of one of the substations but cannot tell the capacity.

Could you please confirm what supplies are coming from each.

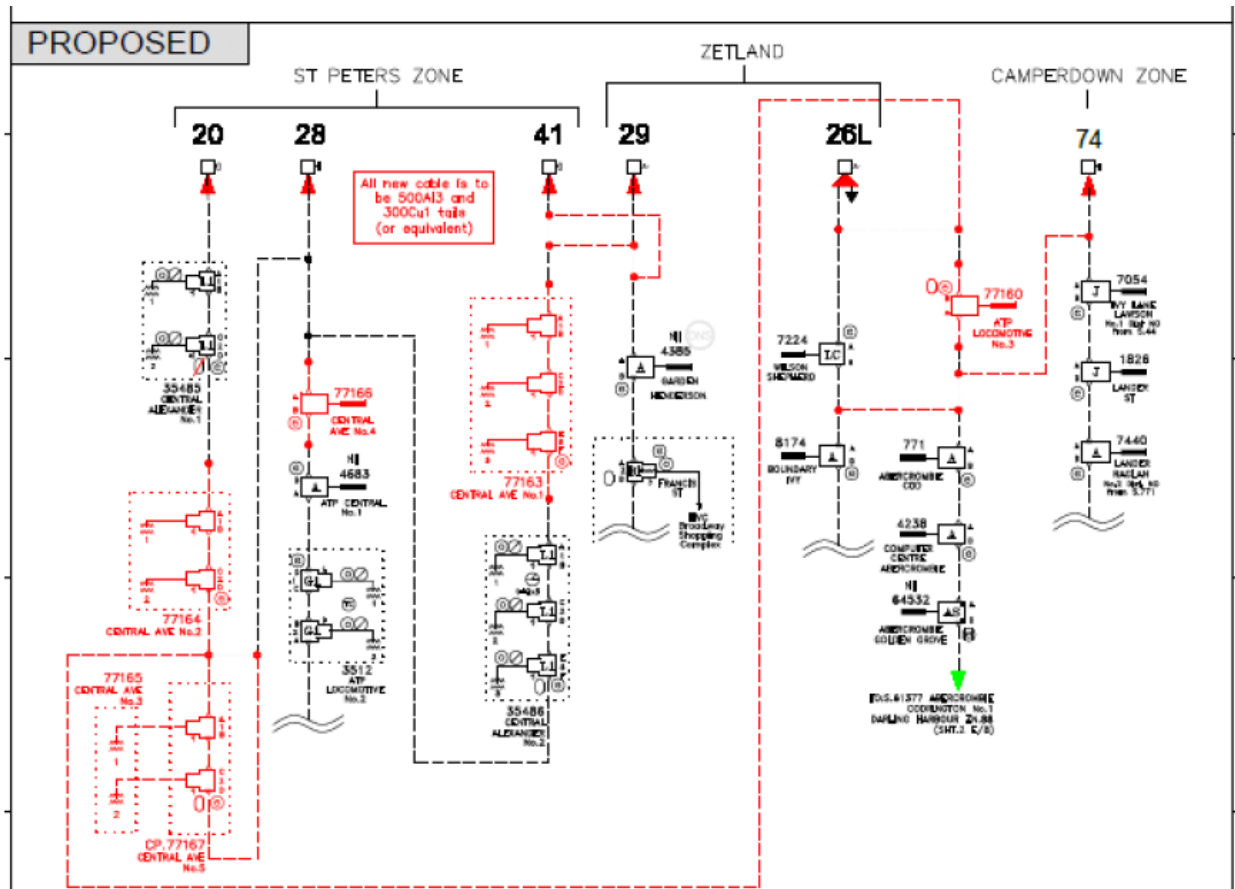
Thanks in advance.

Kind regards,

Vince Nigro



Proposed High Voltage Connection Diagram



Proposed High Voltage Connection Schematic

Electrical Maximum Demand Calculation							
ATP - Locomotive (Foxtel Scenario 2)							
Commercial building with retail							
Air Conditioning							
10 Lifts							
Nil carpark							
Nil Carpark Exhaust							
Job No: VE - N15_119							
General	Area (m2)	Quantities	VAm2	I (A)	VA	I (A)	Subdivided I (A)
Carpark (Mechanically Ventilated)			20		0	0.0	
Carpark (common areas)			10		0	0.0	
Carpark Lighting	0	10	10	30	0	0.0	
Lifts						300.0	
External Area	0		5		0	0.0	
Common Space			10		0	0.0	
Atrium Exhaust							300
Commercial							
	Area (m2)		VAm2		VA	I (A)	
Level 00							
Commercial							
Commercial 1	0		95		0	0.0	
Commercial 2	0		95		0	0.0	
Commercial 3	7,625		166		1263750	1634.4	
Commercial 4	510		95		48450	70.2	
Existing Tenant (Bay 15)	1,335		95		126825	183.6	
IOT Tech	1,760		95		167200	242.3	
Scale Up Space	910		250		227500	329.7	
Tech Shop	395		250		98750	143.1	
Retail							
Supermarket	2,330		295		687350	996.2	
Coffee (Retail)	470		440		206500	299.7	
Dessert	320		220		70400	102.0	
Coffee	50		550		44000	63.8	
Butter (Retail)	275		500		137500	199.3	
Artisan Lane (Retail)	120		600		72000	104.3	
Alcohol (Retail)	420		165		69300	100.4	
Retail 1 (50m2)	50		900		72000	104.3	
Retail 1 (70m2)	70		950		66500	96.4	
Gym	0		70		0	0.0	
Retail (430m2)	430		480		206400	299.1	
Blacksmith/Hard Arts	820		55		45100	65.4	
Anchor (Retail)	775		270		209250	303.3	
Retail (60m2)	60		1200		72000	104.3	
Common							
Loading Dock	330		20		6600	9.6	
EOT	555		70		38550	56.3	
Mechanical Load to Retail (except Supermarket)		3,920	50		196000	284.1	
Area Total (Level 00)	19,115						5,992
Level 01							
Commercial							
Commercial 1	0		95		0	0.0	
Commercial 2	0		95		0	0.0	
Commercial 3	5,505		166		963630	1396.6	
Commercial 4	0		95		0	0.0	
Existing Tenant (Bay 15)	1,335		95		126825	183.6	
IOT Tech	1,485		95		141075	204.5	
Scale Up Space	800		250		200000	289.9	
Tech Shop	390		250		97500	141.3	
Retail							
Supermarket	0		200		0	0.0	
Coffee/Dessert/Butter/Pop Up/Artisan Lane	0		140		0	0.0	
Other Retail	0		140		0	0.0	
Gym	1,315		210		276150	400.2	
Market Store	0		20		0	0.0	
Wellness	480		150		72000	104.3	
Medical	420		165		69300	100.4	
Event Space	895		100		69500	100.7	
Library	550		120		69600	100.9	
Common							
EOT	0		70		0	0.0	
Loading Dock	0		20		0	0.0	
Mechanical Load to Retail (except Supermarket)		2,175	50		108750	157.6	
Area Total (Level 01)	13,305						3,180
Area Total	32,420						
Total (without Diversity) Amps							9,472
Total (after Diversity) Amps							7,578
Available Supply (Firm Rated) Amps							4,480
Available Supply (Non-Firm Rated) Amps							3,308
Spare Capacity (Firm Rated) Amps							-3,178
Spare Capacity (Non-Firm Rated) Amps							-2,378
Commercial (without diversity) Amps							5020
Commercial (with diversity) Amps							4016
Retail (without diversity) Amps							3071
Retail (with diversity) Amps							2457
Common (without diversity) Amps							366
Common (with diversity) Amps							293
Existing Substation 93507 Firm Rating Amps							2900
2 x 1,500kVA (West)							
Existing Substation 93512 Firm Rating Amps							1500
2 x 1,000kVA (East)							
Estimated PCA Grade A Generator Capacity (kVA)							1545

Maximum Demand Estimates with High Power User Tenant

Preliminary enquiry

FORM NECF - 01

When to use this form

If you have a specific enquiry related to:

- establishing a new connection to the Ausgrid network, or
- modifying an existing connection to the Ausgrid network, or
- relocating existing Ausgrid electrical network assets, and

our [Connecting to the Network](#) section of the website has not answered your question, then use this form to help us respond to your enquiry.

A preliminary enquiry is also required for some larger connections. You should refer to the NECF-01 Form Guide if you are intending to register or require an exemption in accordance with the National Electricity Rules, to ensure you include the appropriate information.

For all other Ausgrid enquiries call us on 13 15 35 or go to

[Ausgrid Contact Us](#) (<http://www.ausgrid.com.au/Common/About-us/Contact-us>) on the Ausgrid website

A charge of \$230.28 per hour (GST incl.) applies for provision of initial advice, refer to the NECF-01 Form Guide for further details

Fields marked with an * are mandatory

PART A: PREMISES AND DEVELOPMENT DETAILS

1. About you - the enquirer

Title, first name, last name *	Vince Nigro	Phone number * (and/or)	(02) 8488 4600
Postal address *	Suite 1.11, 75 Mary Street, St Peters	Mobile phone number *	0431 251 037
Email address *	vince.nigro@igs.com.au	Fax number	(02) 9475 4588

2. Type of Enquiry (select one or more) *

Related to the relocation of Ausgrid's electricity network assets	☐	Refer to the NECF-01 Form Guide for the additional information requirements.
Related to a new or altered load connection - less than 10MVA	☒ - 10MVA or greater	
Related to an Embedded Generator (EG) connection - less than 5MW	☐ - 5MW or greater	

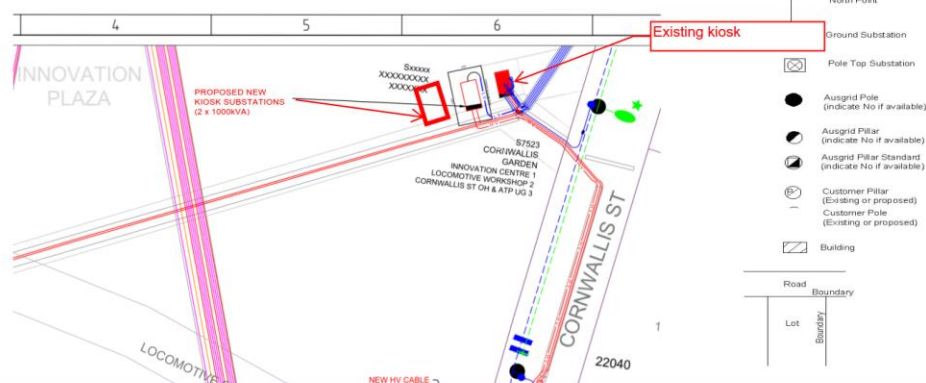
☐ Complete Part B of Form if EG is 5MW or greater

3. Premises details and location diagram

NMI	Meter number
Floor number	Unit number
Street number or RMB *	Lot number *
or	DP number *
Street name *	Post code *
Suburb *	Nearest cross street

Locomotive Street
Eveleigh
Cornwallis St
22040

Diagram * Please draw a location diagram of the proposed relocation or connection works or EG to be connected, using the following symbols as needed

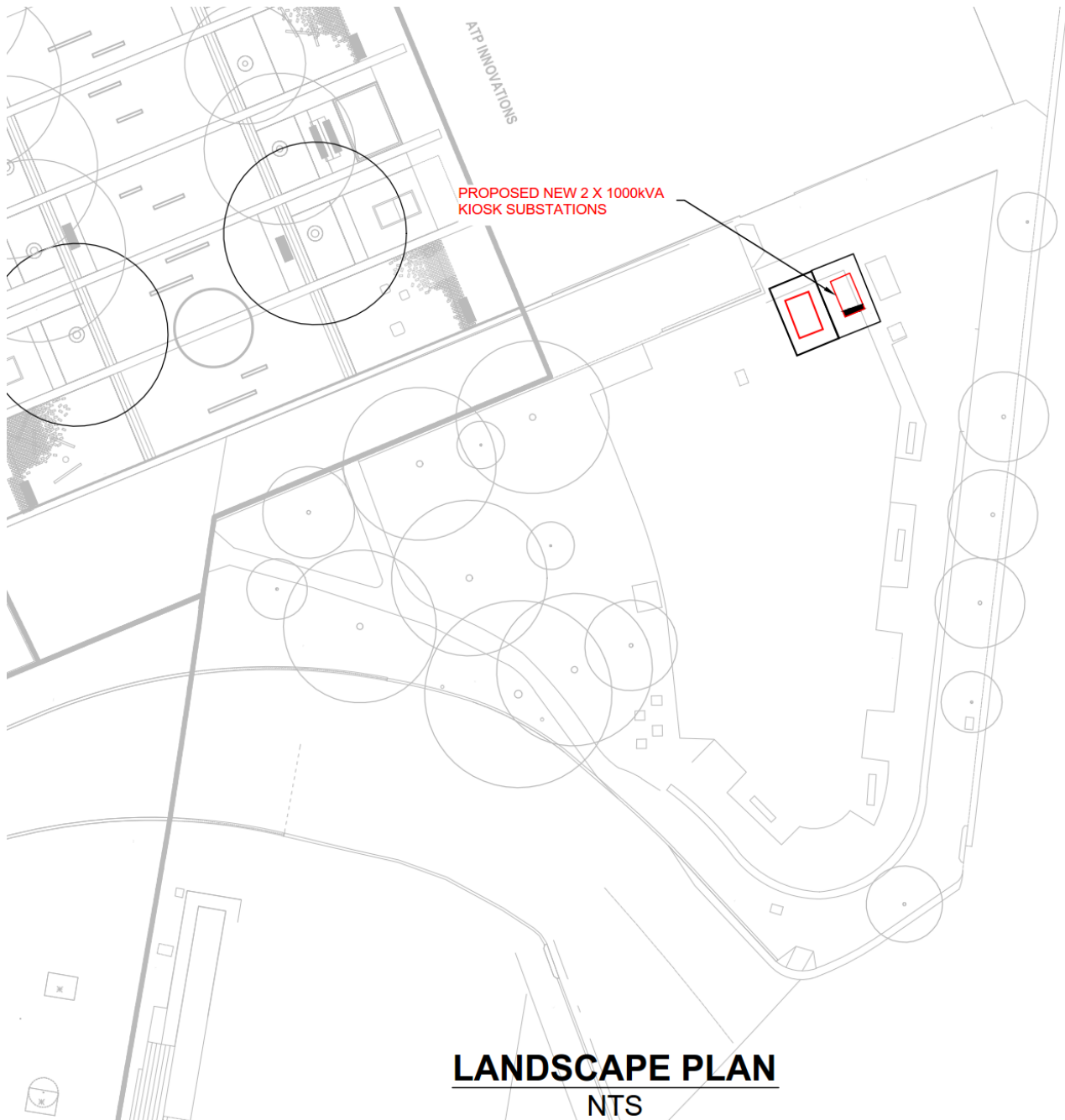


4. Your question(s)? Include comments or attach additional information as specified in the NECF-01 Form Guide *

We currently have an application for a 1 x 1000kVA (S.77160) kiosk substation for Locomotive building which is part of the whole masterplan for the precinct. The refurbished building is proposed to have both commercial and retail tenants. The revised maximum demand indicates 2 x 1000kVA kiosks will be required.

Could you please investigate the viability of adding a further 1000kVA kiosk for Locomotive (total new 2 x 1000kVA).

Preliminary Enquiry Form to Ausgrid for Proposed New 2 x 1,000kVA Kiosk Substations



Proposed Location for New 2 x 1,000kVA Kiosk Substations

Next steps will be:

- Obtain confirmation from Ausgrid that 2 x 1000kVA kiosks can be provided for the development;
- Obtain Design Information Package (DIP) from Ausgrid;
- Carry out Level 3 ASP design of the HV network required to the site;
- Obtain approval from Ausgrid and receive certified design;
- Construct the works in accordance with the building construction programme.

2.1.2 Telecommunications

A meeting with Telstra was conducted on Friday 18 September 2015 with Mirvac in attendance and follow up meetings in March 2016 and March 2017.

Telstra confirmed that the ATP precinct was already serviced by diverse telecommunications feeders from Redfern and Newtown Exchanges.

The existing Building Distributor (refer below) is already serviced via the National Innovation Centre (NIC) building with fibre tie cabling as well as direct lead-in services from Telstra, Optus, Vocus Pipenetworks and Nextgen. Therefore, at this stage, we expect the existing incoming telecommunications services to be able to cater for the proposed refurbishment works.

As there is currently only a single Building Distributor in the building diverse feeds are not currently available.

Telstra further advised the following:

- Mirvac would need to extend the pit and pipe infrastructure within ATP to facilitate any required diversity to the respective buildings;
- Diversity agreed was possible to Buildings 1, 2 and Loco Workshop from respective exchanges. Final routes of these feeds cannot be guaranteed to come from totally diverse directions;
- All diverse feeds could be independent so that the buildings could be divested off individually in the future without affecting one another;
- Timing was not an issue (i.e. mid 2018);
- Next steps is to formally register the projects;
- The buildings would all need to be individually registered;
- Telstra advised that internal pit and pipe costs would be on Mirvac; and
- Policies associated with these works are on the Telstra Website – Smart Communities.

Meetings have also been held with NBN with advice provided as follows:

- NBN rollout for Alexandria / Redfern area expected complete by July 2019 and covers rollout of existing properties;
- New Projects can be targeted for NBN connection over the next 12 – 18 months;
- It is most likely that Buildings 1 & 3 would not be connected to NBN, based on current correspondence with Telstra – existing Telstra network on the site, timing for building completion;
- Potential for Building 2 to be connected to NBN for timing. However, NBN cannot offer diverse feeds into a site so it is unlikely that CBA would take it up;

- There is potential for base building incoming services to be connected. However, the current Services documentation asks for 50 pair copper phone lines to all floors, so the work in overcoming the project design may prove impractical;
- Finally, Locomotive St may choose to connect to NBN, however, once again based on the existing Telstra / Optus infrastructure in the precinct this is perhaps unlikely;
- In summary - while the NBN rollout will be active for the ATP and surrounding areas over the next 12-24 months, given the nature of the commercial development (tenant sourcing own fibre connections for business connections) the need for fibre phone lines for base building is unlikely to eventuate;
- We have yet to ascertain whether there is sufficient space within the existing Building Distributor to cater for NBN equipment. Regardless, spatial provisions for NBN will be provided within communications risers on the commercial office floors.



Location for Existing Communications Building Distributor

3. BUILDING ENGINEERING SERVICES DESIGN METHODOLOGY

3.1 Electrical Services

3.1.1 Regulations and Authorities

Relevant authorities / key stakeholders having jurisdiction over this service are as follows:

- CBA / Mirvac Design Brief (specifically agreed for this project);
- Building Code of Australia;
- City of Sydney Council;
- Relevant Australian Standards;
- Fire and Rescue NSW;
- AS/NZ 3000 – Australian Wiring Rules;
- Service and Installation Rules of NSW;
- Ausgrid Rules and Regulations;
- Australian and Communications Media Authority (ACMA);
- Australian Communications Industry Forum (ACIF); and
- Telstra/Optus.

3.1.2 Design Methodology

Substation

Re-use of one of the existing onsite Ausgrid substations and the addition of a single 1,000kVA kiosk substation will be provided to cater for the anticipated electrical load of the proposed Commercial portion of the Locomotive development site.

The respective capacities and diversity arrangements of each substation are as follows:

Existing or New	Substation No.	Type	Capacity	Rating (A/ph)	Feeder	To Serve
Existing	S.3507	Surface chamber	2 x 1500kVA	2,900	St Peters	Commercial Portion
New	S.77160	Kiosk	1000kVA	1,400	Camperdown	Commercial Portion
Total				4,300		

Electricity Supply

The electricity supply to the proposed onsite substations will be via the Ausgrid high voltage network in the vicinity of the site.

The new high voltage feeders will be reticulated underground to the new substation locations.

Emergency Power Generation

To comply with BCA and PCA A-Grade building requirements.

Consumer Mains

The consumer mains will be two (2) hour fire rated and reticulate from the respective onsite substations to the respective main switchboard(s). It is proposed to re-use the existing 3000A rated busduct currently in place from the substations to new main switchboards.

Main Switch Boards

Main switch boards will be Form 3B and IP42 rated.

The existing main switchboards serving the site will not be re-used as they are nearing useful life and would be useless to attempt to modify for use in the new development. It is therefore proposed that there will be three (3) main switchboards to serve the Commercial portion of the development.

The electrical main switch room(s) will have two (2) forms of egress and fully comply with Ausgrid and NSW Service Rules requirements.

Main switchboards will be dedicated “house” or “tenant”.

Distribution Boards

Distribution boards will be Form 1 construction and IP42 rated.

Distribution boards will be provided as follows:

- Each commercial area;
- “House” areas of the development.

Subcircuit Cabling

Subcircuit cabling will be in accordance with AS3008 and AS/NZS3000.

Subcircuit cabling will be sized to cater for:

- the respective load;
- fault current rating; and
- voltage drop.

Submain cabling will be XLPE type with the exception where fire rated cabling will be provided for safety services in accordance with the BCA.

Earthing

A MEN earthing system will be provided to the building in accordance with AS/NZS3000, Service and Installation Rules of NSW, and Ausgrid.

House and Tenant Metering

“House” distribution boards and associated “house” services will be metered at the respective main switch board.

Commercial tenant metering will be carried out floor by floor or bulk metered in the main switchroom.

Private metering will be provided to cater for BCA Section J, Green Star and any Mirvac shared services requirements.

Cable Reticulation

It is currently proposed to reticulate main tenant power and communications cabling within the Commercial space via a new raised floor on each level.

The base building services such as lighting, access control and minor power would be reticulated along cable trays/ladders/baskets reticulated at high level within the ceiling space on ground level and high level but **exposed** on level 1 (since there is no ceiling proposed on level 1).

General Lighting

General internal lighting will be provided in accordance with AS1680 to 85% of the internal office areas.

External lighting will be provided in conjunction with architectural design and in sympathy with the heritage nature of the building.

General lighting in the commercial office space will be a high performance LED troffer type. Where no ceilings will be installed, a suspended version of the light troffer will be provided.

Exit and Emergency Lighting

All existing exit and emergency lighting will be removed. New single point LED type exit and emergency lighting will be provided with a centrally monitored system.

Exit and emergency lighting will be in accordance with AS/NZS2293.

Telecommunications

The new development will re-use the existing single central building distributor (BD) in its current location. Existing conduits and lead-in cabling is already in place from a number of carriers having presence in the building and will be re-used to cater for the new development.

In addition to existing carrier lead-in services, the existing building distributor also houses existing security equipment in communications racks, the existing MDF and fibre tie cabling patch panels located in racks. Some of this equipment is proposed to remain in situ but there is some spare space available for additional carrier equipment should it be required. However, with the number of existing carriers in place the amount of additional lead-in requirements are estimated to be minimal.

The existing lead-ins to the building are not confirmed to be 'diverse' as they reticulate within Locomotive St. Separation of lead-ins is currently unknown.

Floor distributors (IDF's) will be provided to each commercial tenant.

Diverse risers will be provided to the commercial portion of the building in accordance with PCA Grade A requirements.

MATV and PAYTV

A dedicated and centralised "free to air" digital capable MATV system will be provided to the building shared between the Commercial and Retail portions of the building.

There will be an RG11 backbone to splitters located on each level within the telecommunications floor distributors (IDF's).

The MATV/PAYTV system will also consist of:

- space on the roof for a satellite antenna/dish;
- space within the centralised telecommunications building distributor (MDF) or plantroom for PAYTV equipment.
- Splitters within risers for connection by tenants.

Any existing system will be investigated for appropriateness for re-use.

Security

CCTV

The CCTV system will consist of the following:

- The existing head end located in the existing Building Distributor. The existing head-end will be investigated for re-use and augmentation;
- The existing Security Control Room is proposed to be relocated from the southern side of the building to a new location (potentially in Bay 16). Final location will be discussed during design development;
- Information to hand suggests existing cameras around the precinct connect back to the head-end within the existing BD. These are cabled with co-axial cabling then converted to UTP via channel encoders for connection to Ethernet switches. These cameras are proposed to remain in place connected to the existing head-end;
- New cameras would IP based, individually addressable, CCTV cameras located at the following points:
 - lift areas;
 - ground floor lift lobby areas;
 - fire stair doors
 - ground floor building perimeter entry;
 - entry and exit points of the building;
 - public areas;
 - as well as any other locations required by PCA Grade A requirements or instructed by the City of Sydney Council in their DA conditions of consent.
- Data backbone cabling to accommodate the CCTV camera infrastructure;
- Digital Video Recording (DVR) system capable of providing thirty (30) day storage capacity;
- CCTC system will be backed up by UPS for 30 mins.

Intruder Detection

At this stage intruder detection to internal spaces will be provided by the individual tenants.

The access control system proposed will be capable of supporting intruder detection field devices.

Access Control

The Access Control system will consist of the following:

- The existing head end is currently located in the existing Building Distributor. The system seems to warrant replacement. A new head-end would be proposed to be located within the existing BD to cater for new access control and intruder detection devices;
- IP based, individually addressable, card readers located at the following points:
 - Perimeter and entry doors;
 - Plantrooms;
 - Lifts doors;
 - End of trip facilities;
 - any other locations required by PCA Grade A requirements
- Data backbone cabling to accommodate the access control infrastructure;
- Reed switches to all building perimeter doors;
- Access control proximity cards;
- Door controllers;
- IP intercom points to the following locations:

- main entries;
 - Loading dock.
- Proximity cards will be photo ID printable and the necessary software, hardware and printer will be provided in the Security Control Room;
- System will be scalable to allow future connection of additional Lessee systems;
- All security panels will have battery backup of eight (8) hours;
- The access control system will include single level anti-pass back;
- At this stage access control to internal spaces will be provided by the individual tenants.

Lightning and Surge Protection

To be installed to AS/NZS1768.

Power Factor Correction

Power factor correction will be provided at the main switch board(s) in accordance with the Installation and Service Rules of NSW.

The power factor correction units proposed will correct the power to a factor of 0.95 or better.

Existing Tenant in Bay 15

Currently, Bay 15 has an existing commercial office tenant who will be remaining during the construction works and at completion of the refurbishment.

Therefore, this tenant must be catered for in the design to maintain and upgrade services as necessary to allow the tenant to continue to operate. A business continuity strategy will be put in place in order to maintain services to the existing Bay 15 tenant and minimise any cutover time.

This will include but not be limited to:

- Power supply;
- Communications connectivity;
- Access control & CCTV coverage.

Our understanding is the existing tenant is a film editing studio that are operating almost 24/7. Therefore, special attention to cutover times and temporary services (e.g. temporary generator backup) may need to be considered.

3.4.3 ESD Initiatives

At this stage, the following ESD initiatives are proposed:

- Automated lighting control;
- Energy efficient lighting and lighting systems (high efficiency LED troffers);
- Lighting levels and lighting power densities to all other areas in accordance with BCA – Section J requirements;
- Zoned (less than 150m²) in accordance with PCA Grade A, BCA or Green Star requirements (the lesser);
- Digital power metering of all submains;
- Reduction of “spill” lighting;
- Power factor correction;

Subject to ESD input from Sustainability Consultant.

3.4.4 Indicative Spatial Requirements

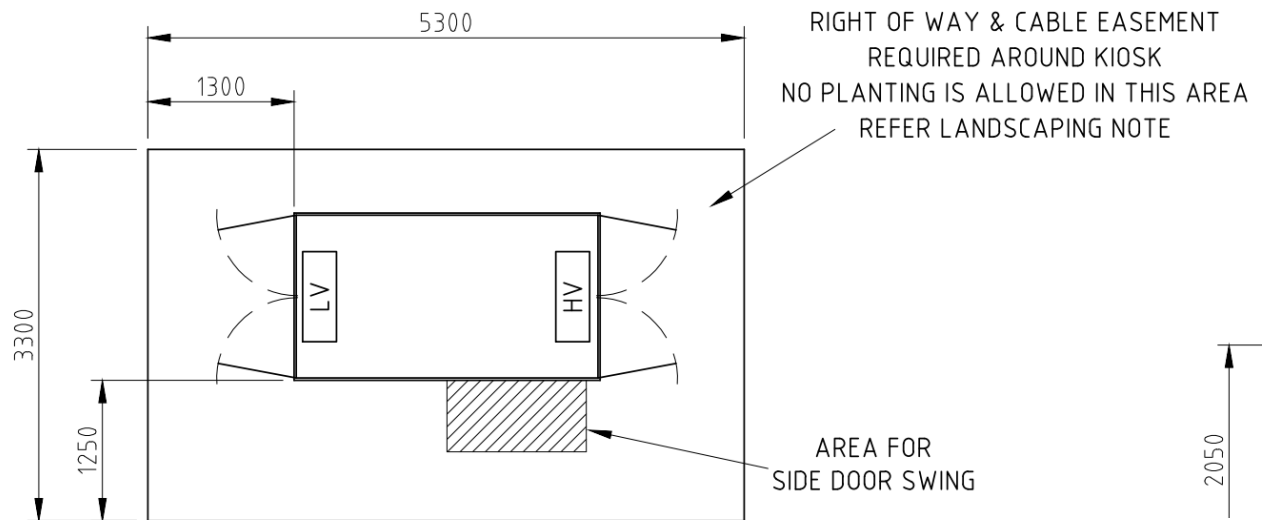
Refer to Appendix B or this document.

APPENDICES

Appendix A

Type “L” Kiosk Substation Layout

A1 - TYPE "L" KIOSK SUBSTATION LAYOUT



SITE PLAN A
Scale 1:50

Appendix B

Indicative Spatial Requirements

Locomotive (Bays 05-15) - Communications/Electrical/Security (Indicative Only)

Plantroom	Size (L x D)	Height (Clear Inside)	Access/ Egress	Location	Special Requirements	Comment
COMMUNICATIONS						
1.1 Main Campus Distributor (BD) Security/Access Control Room	NA	NA	NA	NA	NA	NA
1.2 Building Distributor (BD)/ Cross Connect (With Fibre RIMS)	Re-use existing	Re-use existing	Existing - From external door Key Lockable (MDF Key)	Existing - Ground	Doors smoke sealed, fire resistant.	Main Data and Voice Cross Connects. Currently at least three (3) major Telco's cabling is evident. Currently houses existing security & CCTV head-end equipment & tie cabling from NIC (proposed to remain). Shared between Commercial & Retail.
1.3 Floor Distributors/ Intermediate Cross Connect Closets (House)	2200 x 500	2500	Common area. Key lockable.	Four (4) on each floor in commercial space.	Doors smoke sealed, fire resistant. Aligned with riser above and below	Includes MATV, security, ICN, DAS, NBN (fibre) & mech controls provision. To reticulate cabling from BD/MDF to FD's/IDF's located in the riser itself. One (1) FD per riser
1.4 Floor Distributors/ Intermediate Cross Connect Closets (Tenant)	800 x 500	2500	Common area. Key lockable.	Two (2) on each floor in commercial space.	Doors smoke sealed, fire resistant. Aligned with riser above and below	As required by PCA Grade A (to commercial office space only)
1.5 Local Distributors	N/A	N/A	N/A	NA	N/A	N/A
1.6 MATV Headend + Masthead Amplifier	2000 x 1000	2000	Common area. Key lockable.	One level below Roof Level or Roof Level if there is any plant room allowance on this level	N/A	Shared between Commercial & Retail
1.7 Distributed Antennae System (DAS)	5000 x 4000	2500	Common area. Key lockable.	Basement or roof	N/A	Provides mobile telephony coverage throughout the building. Allows for three (3) carriers (shared between Commercial & Retail)

Plantroom	Size (L x D)	Height (Clear Inside)	Access/ Egress	Location	Special Requirements	Comment
POWER SYSTEMS						
1.8a Kiosk Type Substation	5300 x 3300	1570	Directly off Public Street	N/A	All structures to be kept outside 3m radius (unless blast resistant and 2 hour fire rated) and 6m from any air intake or exhaust. Must be above 1:100 flood level..	Easement required around kiosk. Minimum 10m away from fire hydrant booster assembly and free air above (no obstructions)
1.8b Surface Chamber	Re-use 1 off existing	N/A	N/A	Existing located on southern side of existing building	Louvres must be 6m string line from outside air intakes or exhausts, 3m from glazing and anything within 3m must be 2kPa blast rated & 3hr fire rated. 10m from sprinkler boosters sets	N/A
1.9 Main Switch Room	Re-use 1 off existing room + one (1) off 7500 x 5500	3000	Building Common Area. (Door to open outwards. Ausgrid key lockable.)	As close as possible to the substations that they service	2 hr fire rated. Mechanical exhaust required. 2 forms of egress from opposing sides of the switch room with doors opening outwards. Strongly suggest to be located adjacent substation.	To accommodate Main Switchboard, Power Factor Correction Units and Meters. Locate as centrally as possible. New room to cater for new commercial main switchboard supplied from new kiosk (Commercial MSR No.2). Remote switches may be required if access to MSR is considered not "readily accessible".
1.10 Building Main Distribution Room	N/A	N/A	N/A	N/A	N/A	N/A
1.11 Generator Room	One (1) off 16000 x 9000	5500	Building Common Area. (Door to open outwards)	Ground or roof level close to the Main Switchroom	2 hr fire rated. Mechanical exhaust required. 2 forms of egress from opposing sides of the room with doors opening outwards. Exhaust to roof. Inlet & outlet louvres referred on opposite walls	Assumes 1 x 1600kVA set. Includes generator switchboard and day tanks. Locate as close as possible to Main Switchroom. One (1) off bulk fuel tank for 12 hours operation located at lowest level with fill points to street. Based on estimated inlet/outlet attenuator & acoustic louvre space. To comply with PCA Grade A. Shared between Commercial & Retail.

Plantroom	Size (L x D) mm Clear Internal	Height (mm) (Clear Inside)	Access/ Egress	Location	Special Requirements	Comment
1.12 Diesel Bulk Fuel Tank Room	6500 x 5000	3000	Corridor Key Lockable	On lowest level	4 hr fire rated with roof of minimum 150mm reinforced concrete	Door sill to be raised to withstand capacity of largest tank. Shared between Commercial & Retail.
1.13 Diesel pump Room	4000 x 2500	2500	Corridor Key Lockable	Ground floor	Adjacent bulk fuel tank room	Shared between Commercial & Retail.
1.14 Diesel Pipe Riser	600 x 300					Shared between Commercial & Retail.
1.15 Diesel Vent Pipe					To terminate 4000mm AFFL of truck fill point and in view	Shared between Commercial & Retail.
1.16 Co-generation Room	N/A	N/A	N/A	N/A	N/A	N/A
1.17 Meter Panel	N/A	N/A	N/A	Integrated in Main Switch Room(s) & riser cupboards	N/A	Provision for on-floor metering within riser cupboards
1.18 Electrical Cupboard Risers (House - Commercial)	3000 x 500	2500	Corridor Key Lockable	Eight (8) on each commercial floor around each core	Doors smoke sealed, non-combustible.	To accommodate electrical submains, tee-offs, provision for meters, tenant & house distribution boards. Front Connected Boards.
1.19 Electrical Cupboard Risers (Dedicated for Commercial Tenant)	N/A	N/A	N/A	N/A	N/A	N/A

Plantroom	Size (L x D) mm Clear Internal	Height (mm) (Clear Inside)	Access/ Egress	Location	Special Requirements	Comment
SECURITY SYSTEMS						
1.20 Main Security Control Room for CCTV / Security / Intercom / Access Control Systems	Relocate existing to a new location	2700	Corridor Key Lockable	To be discussed with Mirvac (most probably in Bay 16)	Access control	New cable ties would need to be established from existing BD to new SCR location. Shared between Commercial & Retail.
1.21 Main Security Equipment Room for CCTV / Security / Intercom / Access Control Systems	Re-use existing Building Distributor	N/A	Corridor Key Lockable	N/A	Existing BD is air conditioned	Re-use existing Building Distributor to accommodate security head end equipment. Shared between Commercial & Retail.
1.22 Security / Building Intercom / Access Control Cables Riser	N/A	N/A	N/A	N/A	N/A	Reticulate directly back down to Main Security Control Room via House Comms Risers
1.23 ICN/UPS Room	3500 x 3500	2500	Corridor Key Lockable	As close as possible to communications risers	2 hr fire rated	To house ICN racks and house UPS. Shared between Commercial & Retail.