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## 160 -172 Lord Sheffield Circuit, Penrith

## **Utilities & Infrastructure Servicing Report**

4 November 2022

200 Euston Road, Alexandria NSW ABN: 68 163 019 029 (02) 8488 4600 admin@igs.com.au

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## Approvals

SJB	Sign: Date: Name:	
Urban Property	Sign: Date: Name:	
IGS	Sign: Date: Name:	

### **Document Control**

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1.0	22 July 2022	Nima Kheradhoosh	NK	Mays Chalak	MC
		Houman Tamaddon	HT		
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		Houman Tamaddon	HT		

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## 1. INTRODUCTION

### 1.1 General

Urban Property has commissioned IGS to carry out a desktop engineering services due diligence / infrastructure servicing report of the proposed development site located at and made up of the following properties:

- 160 Lord Sheffield Circuit, Penrith NSW 2750 (Lot 3011); and
- 162-166 Lord Sheffield Circuit, Penrith NSW 2750 (Lot 3001/DP 1184498); and
- 168-172 Lord Sheffield Circuit, Penrith NSW 2750 (Lot 3002).

The proposed development is for a mixed use Residential/Retail/Commercial development consisting of:

- 3 basement levels containing all car parking and servicing for the development; and
- Approx. 14 retail tenancies on ground floor; and
- Commercial tenancies on level 01; and
- Up to approx. 287 residential apartments;
- Amenities including green spaces, pool, public spaces and other communal spaces;

It is assumed that the effective height of the development is over 25m, and it will need emergency lifts as per BCA requirements.

This report presents the findings of a desk study review with respect to the following utility infrastructure lead-in services:

- Electrical;
- Telecommunications;
- Natural Gas;
- Mains Water;
- Sewer.

Flooding is covered in a separate report.



## 1.2 The Site

The site is located at 160-172 Lord Sheffield Circuit Penrith and adjacent to Penrith train station. The combined site area is 8,280 m<sup>2</sup>. Refer to Figure 1 below.



Figure 1 – Site Location (Source: SixMaps)



### **BCA Classification**

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

BCA Classification	Class 2	Residential
	Class 5	Commercial
	Class 6	Ground Floor Retail
	Class 7a	Basement Carpark
	Class 9b	Wellness (TBC)
Rise in Storeys	9 Levels	
Type of Construction	Type A Construction	
Effective Height	32m	
Floor Area (approx)	TBC	

#### 1.3 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 Energy Metering

Additional Requirements:

- BASIX
- Greenstar NABERS (TBC)
- Greenstar NatHERS (TBC)



## 2. UTILITY ENGINEERING SERVICES

### 2.1 Utilities Services Review / Analysis

A utilities review has been carried out in consultation with the relevant local authorities to identify the existing power and telecommunications utilities in the vicinity of the site.

Dial Before You Dig (DBYD) requests were submitted on the 15 July 2022 to investigate the presence of existing infrastructure utilities.

The following utilities with interests/assets in the vicinity of the site were notified in this process:

Seq. No.	Authority Name	Phone	Status
213675018	Endeavour Energy	(02) 9853 4161	NOTIFIED
213675013	Jemena Gas West	1300 880 906	NOTIFIED
213675011	NBN Co NswAct	1800 687 626	NOTIFIED
213675014	OptiComm Ltd (NSW)	1300 137 800	NOTIFIED
213675010	Optus and or Uecomm Nsw	1800 505 777	NOTIFIED
213675009	Penrith City Council	(02) 4732 8010	NOTIFIED
213675017	Sydney Trains Metro West	(02) 9848 9578	NOTIFIED
213675015	Sydney Water	13 20 92	NOTIFIED
213675012	Telstra NSW Central	1800 653 935	NOTIFIED
213675016	Transport for NSW	(02) 8837 0285	NOTIFIED

#### 2.2 Capacity Calculation Assumptions

The following assumptions have been made in carrying out this assessment:

- Site area approx. 8,300m<sup>2</sup>
- EV charging points;
- Approx. 287 Apartment units (subject to apartment planning);
- Potential food & beverage retail in the development;
- 11 Lifts in total;
- Electric heat pumps for domestic hot water plants.



## 3. ELECTRICAL

### 3.1 Electrical Maximum Demand

Based on the preliminary maximum demand, the site requires 2765 Amps when After Diversity Maximum Demand (ADMD) has been applied. This equates to 1950kVA, and is based on the assumptions below:

- Up to 287 apartment units, subject to the final apartment layouts. 4.5kVA has been accounted for each apartment unit in the maximum demand ~ 1.296MVA.
- The maximum demand allows for 20 EV charging points to run simultaneously at full capacity. A load management system will then be used to distribute the capacity allowed among more charging stations.
- Electric heat pumps to be used for domestic hot water plant in lieu of Gas.
- 14 F&B (UNO) retail tenancies;
- Total of 12 lifts;

This demand means the site will require 2 x 1000kVA substations.





Figure 2 – Potential Substation Location on Ground Floor

An application for connection shall be submitted to Endeavor Energy (EE) with the calculated maximum demand. EE will then assess the capacity of their network and issue a design offer for the substations. A chamber substation on the ground floor at the location shown in figure 2 is recommended. The substation chamber shall have street access for EE trucks to access the substation chamber for installation and maintenance purposes.



### 3.2 Chamber Substation Requirements

Based on the preliminary maximum demand, as previously mentioned, 2x 1000kVA 11kV/0.6kV transformers will be required. An indicative layout of a typical EE chamber substation with 2x 1000kVA transformers is shown below in figure 3.



Figure 3 – Indicative Chamber Substation Spatial Requirements

Indicatively allow for 7600x6000 for the substation room at the indicative location shown previously. Final room layout, ventilation requirements and access requirements subject to L3 design.

The cost of a chamber substation with 2x Off 11kV/0.6kV transformers is approx. \$700k. The final cost is subject to the HV cable run lengths and full level 3 design.



### 3.3 Existing Power Infrastructure

A street light pole is located on the front of the NW corner of the site which will need to be removed during the construction stages and reinstalled/replaced afterwards.



Figure 4 – Street Light Pole on The Front of 172 Lord Sheffield Cct

Moreover, a LV overground pillar box has been identified close to the centre-north boundary of the site. This pillar needs to be decommissioned and removed subject to notifying EE and as per EE guidelines.



Figure 4 – Street Light Pole on The Front of 162-166 Lord Sheffield Cct

There are not any overhead electrical utilities going through the site, however, there has been underground HV cables identified going through the site which need to be relocated with appropriate easements as per EE standards.



#### 3.3.1 High-Voltage (HV) Facilities

The underground HV cables going through the site on the boundary between 160 & 162-168, and 162-166 & 168-172 Lord Sheffield Ct are identified as per below DBYD map from EE assets. There is also an underground HV line running below the walkway on the site boundary site along Lord Sheffield Ct which will need to be maintained and protected during construction phase.



Figure 5 – Underground HV Cables Through the Site (Source: DBYD)

Relocating these UG HV cables with appropriate easements is subject to a detailed review and design as per EE network standards. This relocation has been previously studied by AADLER and they proposed relocated easements as shown in figure 6. This relocated route seems to be suitable for the proposed development. The feasibility of the relocation route will need to be confirmed.





Figure 6 – Proposed HV Relocation Plan by AADLER

The HV feeder incomer to the new site substations will need to originate from the nearest substation connected to a feeder with capacity to supply 2x1000kVA substations which will most likely be from the substations shown in figure 7 across the street supplying 81 Lord Sheffield Cct.



Figure 7 – Potential HV Route to Feed the Substations on Site

The final HV route and feeder with capacity is subject to level 3 design.



### 3.4 Summary & Conclusions

Based on the preliminary maximum demand of the site 2x1000kVA substations are required. A chamber substation with 2x1000kVA 11kV/0.6kV transformers on ground floor with easy truck access for EE personnel is recommended. The main switchboard of the site shall be within 40m of the substation location and HV feeder route will be subject to detailed level 3 design.

In the construction phase it is required to relocate the existing HV feeders which are currently going through the site. A markup was previously done by AADLER on 03-02-2022 which shows the indicative proposed easements of the new HV routes to be relocated. Once the relocation plans are finalised, a proposal for asset relocation will need to be submitted to EE. The proposal form is attached in Appendices. Moreover, the HV underground cabling running out front of the site boundary will need to be protected during construction phase.

In addition to the UG HV cables, an LV pillar on the site boundary will need to be decommissioned and removed as per EE guidelines. This will need to be coordinated with EE for further instructions. The street light pole on the front of the NW boundary of the site will need to be removed during construction stages and reinstalled/replaced afterwards.



## 4. **TELECOMMUNICATIONS**

### 4.1 Telecommunications Infrastructure in the Vicinity of the Site

Response from the respective Telecommunication providers and NBN shows multiple existing and proposed conduits, pits and manholes within the vicinity of the site.

The telecommunications services identified are expected to have the capacity to service the future needs of the proposed development.

### 4.2 Existing Services

There are multiple telecommunications carriers with assets in the area to service the development and surrounding site. Carriers identified as having assets in the area are:

- 1. Opticomm Ltd
- 2. Optus
- 3. NBN Co
- 4. Telstra NSW

### 4.2.1 Opticomm Ltd

Based on the DBYD information, there are Opticomm pits and pipes in the vicinity of the site. The Opticomm network can be brought to the site premisses if required with installing additional pits and pipes to extend Opticomm's local network. This is subject to submitting an application with Opticomm and approval of the pathway design plans.

If Opticomm is not pursued as a telco provider for this site, the existing assets are not going to be affected by the development of this site. Hence, no protection consideration is needed for these assets as they are not on the construction route of this development.



Figure 8 – Opticomm Infrastructure Along Lord Sheffield Cct (Source: DBYD)



### 4.2.2 Optus

Optus asset drawings received from the DBYD enquiry do not show any Optus assets along Lord Sheffield Ct. It needs to be noted that these drawings are informative only and not necessarily accurate and/or up to date. However, there are a number of Optus pits and underground cables/conduits shown along Belmore St and Henry St on the south side of the railway station. If required, Optus's local network can be extended to the vicinity of the site (if not already there, subject to up-to-date Optus drawings).



Figure 9 – Optus Infrastructure in the Vicinity of the Site (Source: DBYD)



## 4.2.3 NBN Co

According to DBYD information, the National Broadband Network (NBN) has assets and a series of distribution and services pits in the vicinity of the subject site and along Lord Sheffield Ct. To bring NBN into the premisses a P100 conduit is required as per NBN Pit & Pipe design guidelines. The distribution pit located at the front of 168-172 Lord Sheffield Ct (denoted with number <u>8</u>) has capacity for the required P100 Lead-In-Conduit given the main communications room is within the maximum run length of a P100 conduit as per NBN design guidelines. Final location of the main communications rooms and pit requirements tbc in design development stages.

As part of the demolition process, this infrastructure will need to be protected. Services within the development site (not identified in DBYD maps) will need to be disconnected and removed or relocated in consultation with NBN.



Figure 10 – NBN Infrastructure Along Lord Sheffield Cct (Source: DBYD)



### 4.2.4 Telstra NSW

As shown in Figure 9, the development site is referred to as NBN Co Site on the Telstra maps received from DBYD. However, at the south side of the railway a number of Telstra assets existing close to the site can be observed. Telstra assets have also been identified within the Thornton Community Garden which can be utilised to bring the Telstra local network to the site if required.

Additional pits and conduits may be required subject to detailed existing Telstra assets on site (can be requested directly from Telstra) and detail design development.



Figure 11 – Telstra Infrastructure Along Lord Sheffield Cct (Source: DBYD)

## 4.3 Summary and Conclusions

The most accessible Telco on the vicinity of the site is NBN.co which can be brought to the site by connecting to the nearest pit. Other Telcos' local networks shall be extended to be brought to the site.



## 5. NATURAL GAS

#### 5.1 Gas Maximum Demand

The gas maximum demand has been estimated at:

• 20,000 MJ/h diversified load.

This is based on the Heating Ventilation and Air Conditioning (HVAC) System being a reverse cycle, split, air cooled, type system. It has been assumed that centralised hot water plant, cook tops and food retail units will require gas (subject to electrification requirements / conditions / client direction).

#### 5.2 Jemena Infrastructure in the Vicinity of the Site

There is an existing 50mm NY 210 kPa medium pressure gas mains running through Lord Sheffield Cct:



Figure 12 – Jemena Natural Gas Infrastructure

#### 5.3 Summary and Conclusions

Jemena have extensive infrastructure in the vicinity of the site and can easily cater for the proposed new development.

The existing 50mm 210kPa Natural Gas main is the most likely capable of supplying the gas demand, subject to Jemena approval.



## 6. MAINS WATER

#### 6.1 Water Maximum Demand

Water maximum demand has been estimated as follows:

- Cold Water 160 kL/day;
- Fire Hydrant System 30 L/s;
- Fire Sprinkler System 18 L/s;

#### 6.2 Existing Services

There are no major water services within the site that will need to be decommissioned and/or diverted. Any minor water services within the site, if present, can be readily decommissioned during site works/demolition.

#### 6.3 Mains Water Infrastructure in the Vicinity of the Site

Sydney Water is the responsible authority for the provision of potable water to the site. There is a 150 mm PVC potable water main located in Lord Sheffield Cct at the frontage of the development.

Figure 13 below indicates the above-mentioned Sydney Water infrastructure in the vicinity of the site.

Each Building (strata) will be provided with a dedicated Sydney Water Master Meter and backflow prevention assembly as per Sydney water metering guideline which also enables separation of services between each stratum.



Figure 13 – Sydney Water - Water Infrastructure Map



#### 6.4 Summary and Conclusions

Amplification and upgrade works to the existing 150mm CICL potable water main in Lord Sheffield Cct is required to serve the proposed development as a single point of supply, subject to Section 73 Notice of Requirements and Sydney Water pressure and flow report. Internal pressure boosting will be required due to the height of the buildings. Water tanks will also be required to satisfy statutory fire services requirements.



## 7. SEWER

#### 7.1 Sewer Maximum Demand

Sewer maximum demand has been estimated as follows:

• Sanitary / Sewer Discharge 140 kL/day.

#### 7.2 Sewer Infrastructure in the Vicinity of the Site

Sydney Water is the responsible authority for the provision of sewer services to and through the site. There are two 225mm PVC Sydney Water sewer mains in Lord Sheffield Cct which will be sufficient to cater for the drainage services requirements of the proposed new mixed-use development. It will be very likely that both sewer connections to be utilised to service the development pending Sydney Water Notice of requirement.

This will be confirmed by the Section 73 that will be lodged with Sydney Water after a Development Application (DA) is obtained.



Figure 10 – Sydney Water – Sewer Infrastructure Map

#### 7.3 Summary & Conclusions

In summary, both of the 225mm sewer mains have sufficient capacity to serve the new development. The nominated point of connection to Sydney Water sewer network will be confirmed in Section 73 NOR. Sewer diversions will also be necessary which may need to be staged in accordance with the proposed project staging.



## **APPENDIX A – ASSET RELOCATION FORM**

Application for the Relocation / Removal of	
Endeavour Energy's Electrical Network Assets	



Application Type: Relocation Removal

Please return completed form along with all attachments to: Endeavour Energy, PO Box 811 Seven Hills NSW 1730 Email: <u>cwadmin@endeavourenergy.com.au</u> | Fax: 02 9853 7925 | For connection enquiries, please contact 133 718

**Incomplete applications will be returned.** The developer is encouraged to approach a Level 3 ASP to obtain preliminary details of the assets and discuss possible solutions to the developer's requirements. The developer must provide as much detail as possible concerning the Endeavour Energy assets that the developer wishes to relocate / remove. A sketch or plan must be attached.

Site Details			
Street:	Suburb / Town:		
Nearest Cross Streets:	UBD Ref:		
Asset Type:	Asset Number:		
Description of Works (Enter Details)			
Developer / Developer's	Representative Details		
Developer's Name:			
Developer's Representative (if applicable):			
Developer / Developer's Representative Reference	e Number for correspondence:		
Address for correspondence:			
	Post Code		
Mobile: Telephone:	Fax:		
Developer / Developer's Representati	ve Acknowledgement and Agreement		
1. in signing and submitting this application I am	requesting an expedited connection:		
<ol> <li>I have read and understood the terms of Endeavour Energy's Model Standing Offer for a</li> </ol>			
Standard Connection Service (Subdivision and Asset Relocation), as published on its website			
at www.endeavourenergy.com.au, and a connection offer by Endeavour Energy for a Standard Connection Service (Subdivision and Asset Pelocation) on the terms of that Model			
Standard Connection Service (Subdivision and Asset Nelocation) on the terms of that woder Standing Offer is acceptable to me; and			
3. if Endeavour Energy is satisfied that the serv	ice requested by me falls within the terms of		
Endeavour Energy's Model Standing Offer fo	r a Standard Connection Service (Subdivision and		
Energy on the terms of that Model Standing (	Offer on the date that Endeavour Energy receives		
this application.			
Developer / Developer's Representative Signature	ð:		
	////////		
* Do you consent to the release of your conta	ct details to other customers with		
similar works in progress nearby to facilitate	e co-operation in design and		
construction activities.			



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