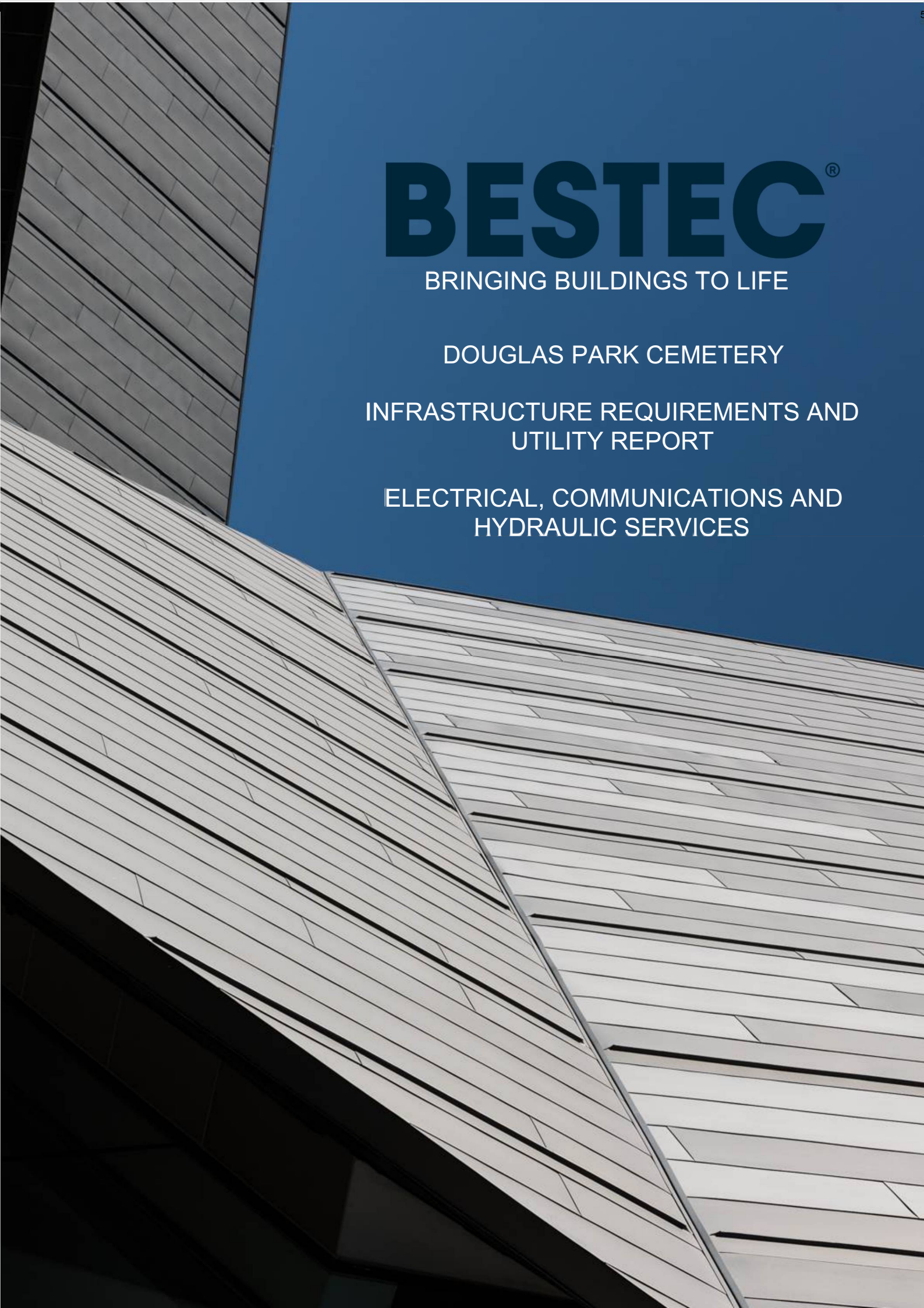




BESTEC[®]

BRINGING BUILDINGS TO LIFE

DOUGLAS PARK CEMETERY

INFRASTRUCTURE REQUIREMENTS AND
UTILITY REPORT

ELECTRICAL, COMMUNICATIONS AND
HYDRAULIC SERVICES

REPORT ISSUE REGISTER

REVISION	DATE	REVISION DESCRIPTION
01	14.06.2024	Preliminary Issue
02	31.03.2025	Preliminary Issue
03	09.05.2025	Submission Issue
04	20.05.2025	Revised Issue

CONTENTS

	Page No.
1. CONSULTANT DECLARATION.....	1
2. INTRODUCTION	3
3. SEARS AND AGENCY ADVICE TABLES	6
3.1 SEARS TABLE	6
3.2. AGENCY ADVICE	7
5. REPORT SCOPE.....	8
5. ELECTRICAL SERVICES.....	9
5.1 EXISTING SERVICES ARRANGEMENT	9
5.1.1 POWER SUPPLY	9
5.1.2 COMMUNICATIONS	13
5.2 PROPOSED DEVELOPMENT WORKS (POWER).....	16
5.2.1 UNDERSTANDING ASP WORKS.....	17
5.2.2 AUTHORITY WORKS (DESIGNED AND DELIVERED BY THE ASP).....	17
5.2.3 PRIVATE WORKS FROM THE AUTHORITY CONNECTION POINT	18
5.2.4 IMPACT OF THE PROPOSED DEVELOPMENT	19
5.3 PROPOSED DEVELOPMENT WORKS (COMMUNICATIONS).....	20
6 HYDRAULIC SERVICES	21
6.1 EXISTING SERVICES ARRANGEMENT	21
6.1.1 WATER SUPPLY.....	21
6.1.2 SEWER DRAINAGE.....	21
6.1.2 NATURAL GAS SUPPLY	21
6.2 PROPOSED DEVELOPMENT WORKS.....	21
6.2.1 AUTHORITY WORKS – WATER SUPPLY	21
6.2.2 AUTHORITY WORKS – SEWER DRAINAGE	22
6.2.3 PRIVATE SEWER DRAINAGE	22
6.2.4 PRIVATE DOMESTIC WATER RETICULATION	22
6.2.5 PRIVATE FIRE PROTECTION SERVICES	23
6.2.6 PRIVATE NATURAL GAS RETICULATION.....	23
7 RESPONSE TO SERVICES RELATED REFERRAL AGENCY ADVICE ITEMS.....	24
8 CONCLUSION	26
9 MITIGATION MEASURES	27
APPENDIX A – DIAL BEFORE YOU DIG DRAWINGS	
APPENDIX B – WORK NEAR OVERHEAD POWER LINES - CODE OF PRACTICE	
APPENDIX C – ENDEAVOUR ENERGY DRAWING NO.86232 OVERHEAD LINES MINIMUM CLEARANCES NEAR STRUCTURES	
APPENDIX D – SURVEY DRAWING REF: 16116-DET	
APPENDIX E – ENDEAVOUR ENERGY PRELIMINARY APPLICATION AND RESPONSE	
APPENDIX F – INDICATIVE SITE SERVICES PLAN	
APPENDIX G – WASTE WATER MANAGEMENT; SITE AND SOIL EVALUATION AND PUMP OUT DISPOSAL	
APPENDIX H – SYDNEY WATER CORRESPONDENCE	

1. Consultant Declaration

PROJECT DETAILS	
PROJECT NAME	Douglas Park Cemetery
Application number	SSD- 68287712
Address of subject land	430-490 Douglas Park Drive, Douglas Park
Lot / DP	Lot 2 in DP 250359.
APPLICANT DETAILS	
Applicant name	Benima Pty Ltd
Applicant address	
REPORT DETAILS	
Name of report this declaration relates	Infrastructure Requirements and Utility Report
Report reference no.	30711/0
Report date	20 May 2025
Company name (inc. ABN / ACN)	BESTEC (Vic) - ABN 38 459 407 863
Author name	Mr Mark Ellul (incorporating advice from other BESTEC Engineers- Mr John Truong, Mr Mark Mitchell and Mr Ondrej Labaj)
Author qualifications	- Member of Engineers Australia Registration No. 2363577 - Fellow of the Institution of Engineers Australia - MIEAust CPEng NER APEC Engineer IntPE (Aus) - Registered Building Practitioner - Electrical Engineer, Victoria Building Act 1993, Reg. No. EE 41574, BLA Reg No. PE0003857 - Registered Queensland Building Practitioner – Electrical Engineer, Board of Professional Engineers of Queensland, RPEQ No. 16743 - Accredited Certifier – Electrical Services NSW Compliance Registration No BPB2826 - Registered Electrical Services Engineer – Tasmania - Registered Professional Engineer – Electrical Services NSW Fair Trading Registration No. PRE0001006 - Registered Design Practitioner – Electrical Services NSW Fair Trading Registration No. DEP0001377
Author address	Suite 1, Level 13 Noth Tower, 80 Collins Street, Melbourne VIC 3000
DECLARATION BY CONSULTANT	
Name	Mark Ellul
Registration no.	BPB2826
Organisation registered with	BESTEC (Vic)
Declaration	The undersigned declares that this Infrastructure Requirements and Utility Report: - has been prepared in accordance with the following policy, guidelines, or legislative requirements: - Service and Installation Rules of NSW - Endeavour Energy rules and regulations - Sydney Water authority rules and regulations - NBN Co. design guidelines

PROJECT DETAILS

- contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the Infrastructure Requirements and Utility Report relates;
- does not contain information that is false or misleading;
- identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project;
- identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the Infrastructure Requirements and Utility Report relates;
- contains a consolidated summary of the proposed or necessary mitigation measures

Signature



Date

20 May 2025

2. Introduction

This Infrastructure Requirements and Utilities Report has been prepared by BESTEC Vic on behalf of Benima Pty Ltd for a combined Concept Plan approval and Stage 1 detailed works for a new multi-denominational cemetery at 430-490 Douglas Park Drive, Douglas Park (Douglas Park Memorial Park - Concept Plan and Stage 1).

The site is located at 430-490 Douglas Park Drive, Douglas Park within the Wollondilly Local Government Area (LGA). The site is irregular in shape with a total size of 16,7940m². It is legally described as Lot 2 in DP 250359. The site is mostly vacant with scattered vegetation and a single, residential dwelling with driveway accessible from Douglas Park Drive. The site comprises two street frontages, to the east is Mitchell Place and to the west is Douglas Park Drive.

This report accompanies a State Significant Development Application that seeks approval for a combined Concept Plan approval and Stage 1 detailed works for a new multi-denominational cemetery.

Concept approval is sought for the use and operation of the site as a cemetery with a maximum, staged capacity of up to 37,107 burial plots including a crematorium, chapel, administration building, vaults, remembrance sanctuaries, general site layout and all associated groundworks, roads, parking, pathways, landscaping and ancillary buildings. Refer to Figure 1.

The Stage 1 works comprise the following (refer to Figure 2):

- All preparatory site works including vegetation protection, enhancement and removal, demolition of existing structures, bulk excavation for burial zones, general ground works and utility service augmentation.
- Vehicular access / egress from Douglas Park Drive with separate vehicular egress only to Mitchell Place.
- Construction of internal roads, pathways and parking areas for approximately 118 car parking spaces inclusive of 1 hearse car parking space.
- Perimeter memorial pedestrian pathway with remembrance sanctuaries;
- Burial zones with a maximum capacity of 15,447 comprising shallow, single and triple layered burial plots;
- Construction of single storey chapel, single storey administration building and single storey storage shed and garage;
- Site landscaping, fencing, lighting and entry signage; and
- The cemetery operating hours, including public access, will be between the hours of 6:00am and 6:00pm, 7 days a week. The opening hours of the Chapel and Administration Building (including café) will be between 8:00am and 5:00pm, 7 days a week.

The burial zone preparation works within Stage 1 will be carried out sequentially within each burial zone and will be based on the demand for burial plots

For a detailed project description refer to the Environmental Impact Statement prepared by Ethos Urban.



Figure 1 – Concept Site Plan



Figure 2 – Stage 1 Works

3. SEARs and Agency Advice tables

3.1 SEARs Table

The following table details each of the Relevant SEARs requirements and the relevant section of the report that addresses the item.

Item	SEARS Requirement	Relevant Section of Report
	<i>In consultation with relevant service providers and associated accredited Utility Designers (such as ASP Level 3 for Power):-</i>	
1.0	SEARS ITEM 25. Infrastructure Requirements and Utilities (Concept Proposal, Page 10) <i>Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site.</i>	See Section 5.1, 5.2, 5.3, 6.2.1
2.0	SEARS ITEM 25. Infrastructure Requirements and Utilities (Concept Proposal, Page 10) <i>Identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained.</i>	See Section 5.2, 5.3, 6.2
3.0	SEARS ITEM 25. Infrastructure Requirements and Utilities (Concept Proposal, Page 10) <i>Provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be coordinated, funded and delivered to facilitate the development.</i>	See Section 5.2.3, 5.3, Appendix F
4.0	SEARS ITEM 25. Infrastructure Requirements and Utilities (Concept Proposal, Page 10) <i>Identify potential impacts to existing utility infrastructure, as a result of the concept development.</i>	See Section 5.1, 5.2, 5.3, 6.2.1
5.0	SEARS ITEM 23. Infrastructure Requirements and Utilities (Stage 1, Page 19) <i>Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site.</i>	See Section 5.1, 5.2, 5.3, 6.2.1
6.0	SEARS ITEM 23. Infrastructure Requirements and Utilities (Stage 1, Page 19) <i>Identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained.</i>	See Section 5.2, 5.3, 6.2
7.0	SEARS ITEM 23. Infrastructure Requirements and Utilities (Stage 1, Page 19) <i>Provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be coordinated, funded and delivered to facilitate the development.</i>	See Section 5.2.3, 5.3, Appendix F
8.0	SEARS ITEM 23. Infrastructure Requirements and Utilities (Stage 1, Page 19) <i>Identify potential impacts to existing utility infrastructure, as a result of the concept development.</i>	See Section 5.1, 5.2, 5.3, 6.2.1

3.2. Agency Advice

Item	Agency Requirement	Relevant Section of Report
1.0	<i>Wastewater Management Plan (National Guidelines) - Wollondilly Shire Council</i>	See Appendix G
2.0	<i>Utilities assessment and planning- - Wollondilly Shire Council</i>	See Section 5.1, 5.2, 5.3, 6.1 and 5.2
3.0	<i>Cremator exhaust stack design - BAT/BEP compliance - NSW Environment Protection Authority (EPA)</i>	See Section 7
4.0	<i>Utility impact assessment and load checks -Endeavour Energy</i>	See Section 5.2
5.0	<i>Infrastructure staging plan - Endeavour Energy</i>	See Section 5.2.2 and 5.2.3
6.0	<i>Network augmentation if needed</i>	See Section 5.2
7.0	<i>All other Endeavour Energy Agency Advice requirements match the SEARs requirements as listed in the SEARs table above.</i>	See Section 3.1

5. Report Scope

The scope of this report is limited to the assessment of the Electrical, Communications and Hydraulic Services.

BESTEC releases this report subject to the following conditions and qualifications: -

- The report may only be used for the purpose for which it was commissioned as stated above.
- The report may only be released in full.
- The report shall not be considered as relieving any other party of their responsibilities, liabilities or contractual obligations.
- The report provides a desktop overview only. No physical inspections were undertaken to prepare this report.
- No computations have been prepared to validate the existing design of the infrastructure services.
- The report does not address the presence of asbestos or other contaminative materials including contaminated soils.
- The report does not present cost comparisons or estimates for the proposed works.
- No ultrasonic services survey work was performed to verify the accuracy of the existing services arrangement.

This report is to be read in conjunction with the Dial Before You Dig (DBYD) services infrastructure drawings which are attached at the rear of the report as Appendix A.

5. Electrical Services

5.1 Existing Services Arrangement

5.1.1 Power Supply

The site is bound by Mitchell Place, Douglas Park Drive and the Hume Motorway with access to street frontage on Mitchell Place and Douglas Park Drive. The existing site is generally bare vegetation with the exception of a single residential house that is serviced for power and communications via Mitchell Place.

The Power Authority to the area is Endeavour Energy.

On the East boundary of the site, the property is surrounded by existing serviced residential houses located on the opposite side of Mitchell Place. There are no other serviced properties on the Northern, Western and Southern boundaries of the site (refer image 1).

Overhead power lines exist at the property frontage on both sides of Mitchell Place. On the side directly adjacent to the development site, 11kV high voltage (HV) Endeavour Energy owned overhead powerlines exist. On the opposite side of Mitchell Place overhead low voltage (LV) Endeavour Energy owned overhead powerlines exist. These powerlines are fixed onto existing Endeavour Energy power poles.

Overhead power lines exist on Douglas Park Drive. On the side of the road not directly adjacent to the development site, existing 11kV high voltage (HV) Endeavour Energy owned overhead powerlines exist (noting that these lines were constructed to facilitate 22kV). These powerlines are fixed onto existing Endeavour Energy power poles. There are no overhead power lines on the side of Douglas Park Drive directly adjacent to the development.

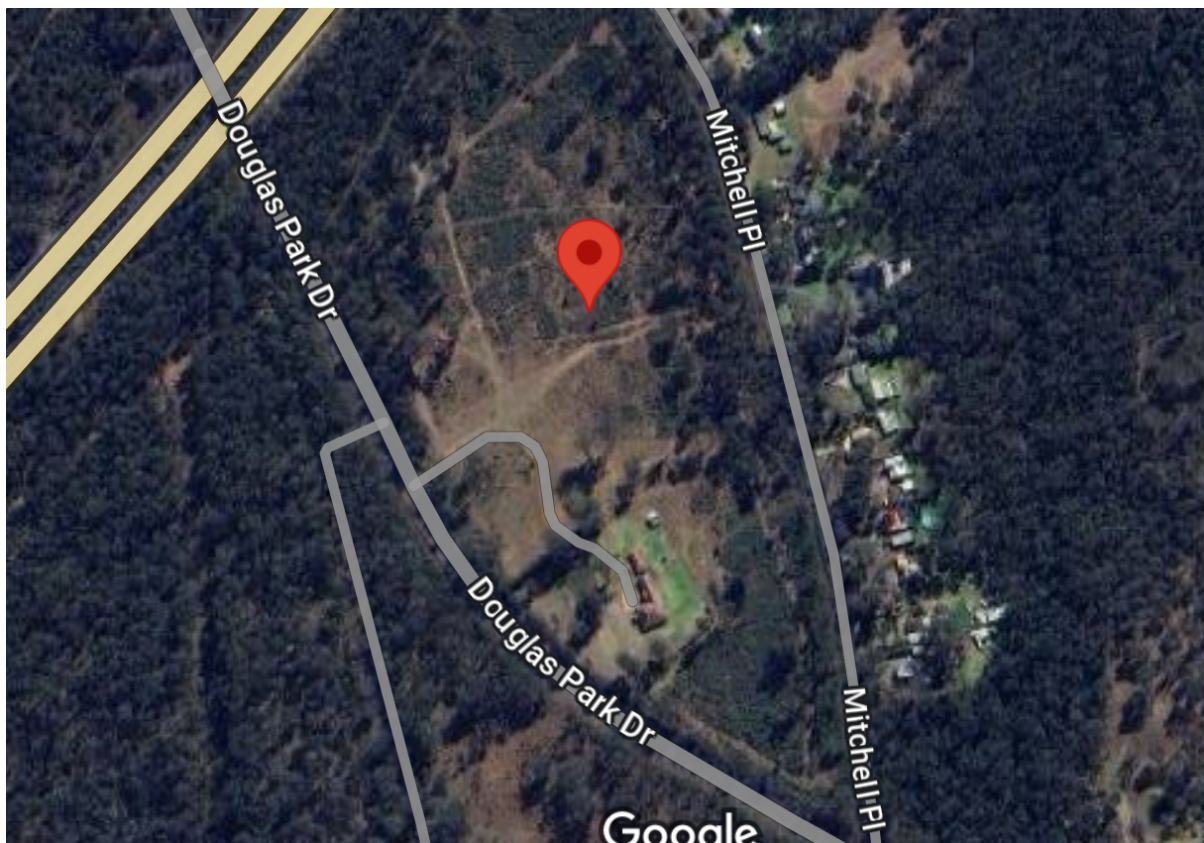


Image 1 – Overall Site Plan

Clearance to existing overhead power lines must be considered both for working near power lines (construction methodology) and for the final building structure. Lifting over live overhead power lines is not permitted. Refer 'Appendix B – Work Near Overhead Power Lines - Code of Practice' and 'Appendix C – Endeavour Energy Drawing no.86232 Overhead Lines Minimum Clearances Near Structures'.

DBYD plans obtained for the proposed development site does not show any existing Endeavour Energy infrastructure assets along Mitchell Place and Douglas Park Drive (refer Appendix A – DBYD plans). This is likely due to the fact that all Endeavour Energy infrastructure on both Mitchell Place and Douglas Park Drive is overhead.

In addition to DBYD plans we have obtained preliminary information from Endeavour Energy's G/Net master facility model (refer Image 2) which has indicated the following:-

- No easements over the site benefitting Endeavour Energy
- Low voltage and 11,000 volt / 11 kilovolt (kV) high voltage overhead power lines (including pole mounted substations no's 10935 and 11467 indicated by the symbol ) to the Mitchell Place road verge / roadway.
- Extended low voltage overhead service conductor coming from a pole on the opposite side of Mitchell Place to a customer owned pole (indicated by the green circle) on the site providing the customer connection point for the existing dwelling / building (which will become a redundant asset).
- 11 kV (constructed at 22,000 volts / 22 kV) high voltage overhead power lines to the opposite side of Douglas Park Drive.

When reading the Endeavour Energy G/Net master facility model, we note that Endeavour Energy stipulate that the extent and type of any electricity infrastructure shown on the plan is indicative only. Generally low voltage lines (normally not exceeding 1,000 volts) are indicated by blue lines and high voltage lines (normally exceeding 1,000 volts) are indicated by red lines.

In discussion with Endeavour Energy (via the ASP level 3 designer), we have been advised that the existing pole mount substations located on Mitchell Place are serving the existing residential properties. Image 2 details the low voltage connections from the substations (shown in blue).

Discussions with Projen, an ASP Level 3 designer, has confirmed that the pole mounted substation (no.10935) located on the Northern section of image 2 is sized at a 100kVA. This currently serves 18 customer connection points. The second pole mounted substation (no.11467) located on the southern side of image 2 is sized at 200kVA. This currently serves 8 customer connection points. Based on the ASP's access to asset information we have been advised that both substations are nearing capacity and will not have sufficient capacity to service the proposed development without upgrade.

No pole mounted substations are currently located on Douglas Park Drive, however, it is noted 11kV high voltage overhead power lines are situated on the opposite side of the development site.

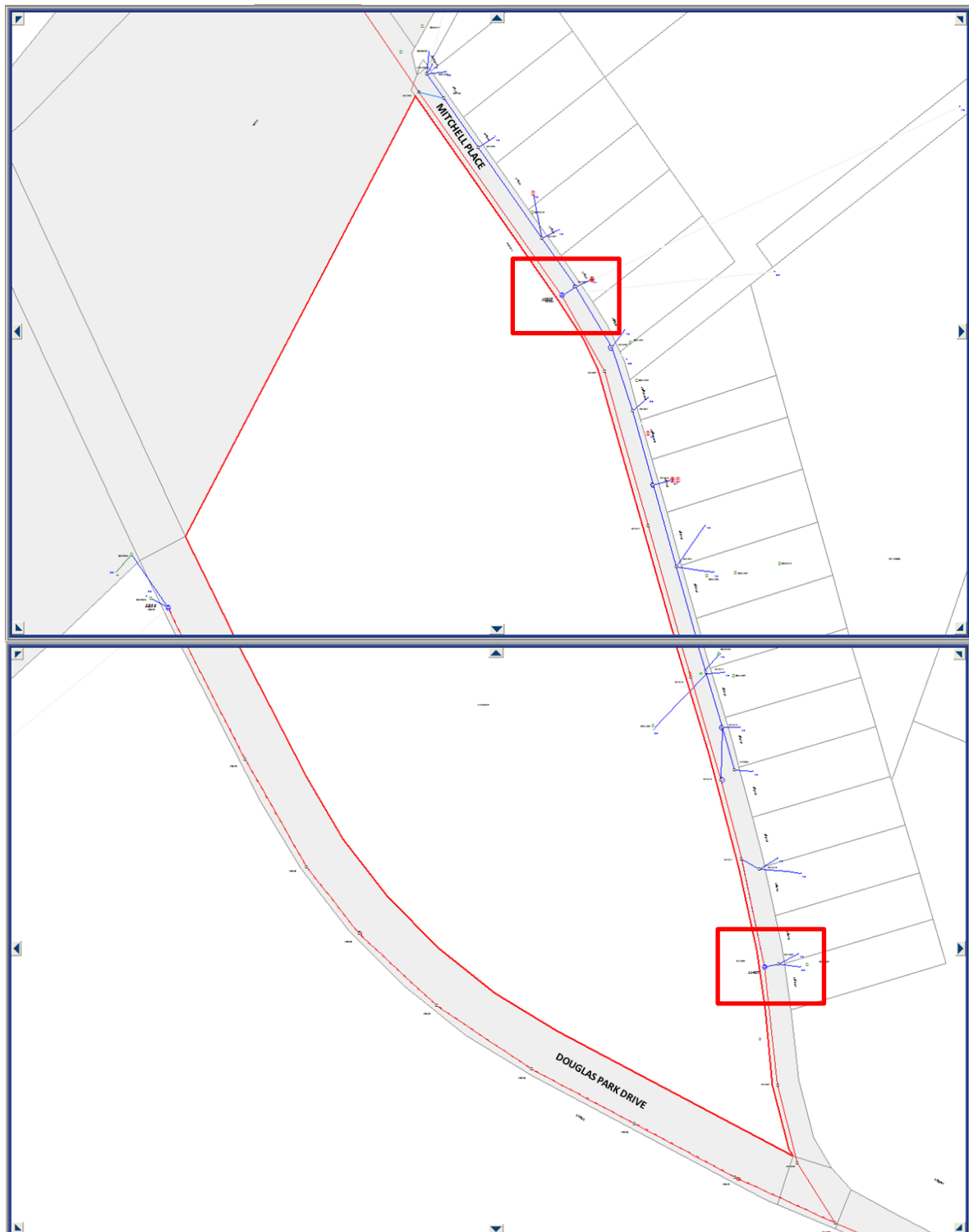


Image 2 – Endeavour Energy's G/Net

The existing residential property located on the proposed development site is serviced via an extended low voltage overhead service conductor emanating from a pole on the opposite side of Mitchell Place. This terminates to a customer owned private pole within the development site providing the customer connection point for the existing dwelling / building (refer image 3 and 4). As part of the development this existing low voltage overhead supply to the site will be removed. Removal of this low voltage overhead supply will be undertaken by the authority and will involve pulling the overhead cable back to the pole on Mitchell Place and removing the associated connection. As this is a low voltage removal it will have no effect on the existing infrastructure post its removal.



Image 3 – Existing Low Voltage Overhead Powerline Crossing Mitchell Place.



Image 4 – Existing Low Voltage Overhead Powerline Extension to Customer Pole to Serve the Existing Residence.

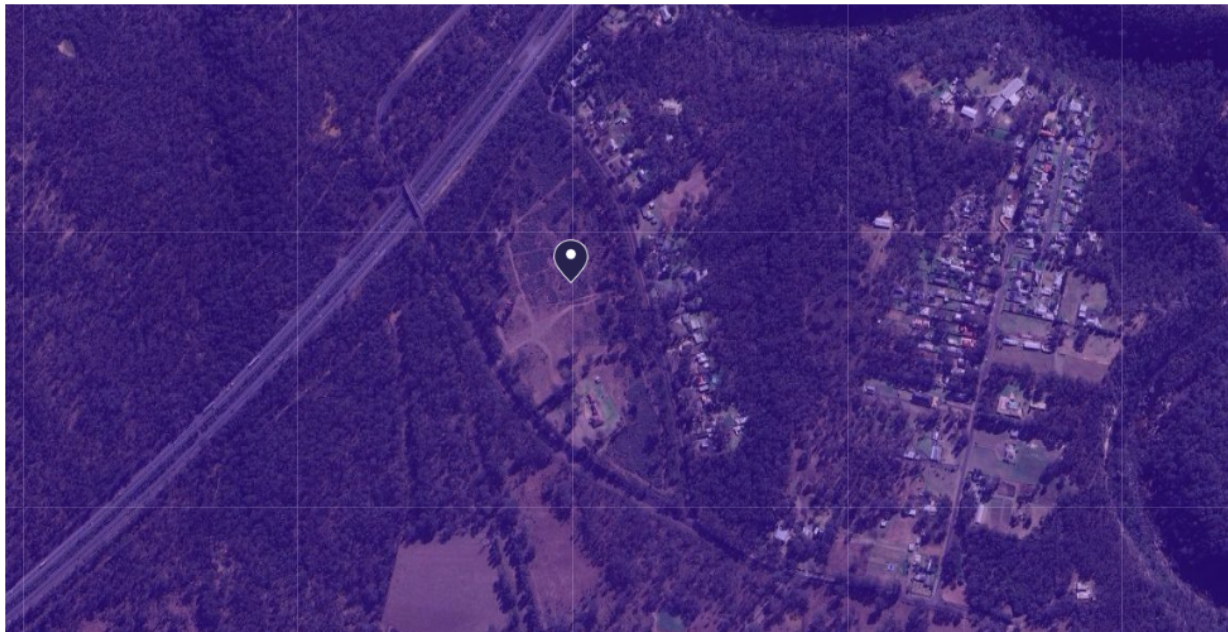
5.1.2 Communications

The NBN roll out map indicates that NBN services are available in the area (refer Image 5 below).

In addition, the DBYD plans indicate the extent of existing NBN Co infrastructure currently installed, with pits and conduits located inside the property boundary of the proposed development site along Mitchell Place (refer Image 6 below detailing a part plan).

Furthermore, the DBYD plans do not show existing NBN Co. pit and pipe infrastructure along the entire length on Douglas Place, however, as noted on the plan of survey drawing ref: 16116-DET, version A (See Appendix D) there are existing inground communications conduits.

Based on the above we note that the availability of Communications to the site is fulfilled via Mitchell Place and we see no major issues with establishing a new NBN connection for the proposed development provided as an extension to the existing pit and pipe infrastructure to a connection point within the proposed site.



Important information: While most premises in the purple "Service available area" can connect to services over the **nbn**® network, some premises may require additional work to be completed first. On rare occasions, some premises cannot be connected. Check your address above and contact a provider to find out if the **nbn** network is available at your home or business.

This site is protected by reCAPTCHA and the [Google Privacy Policy](#) and [Google Terms of Service](#) apply.

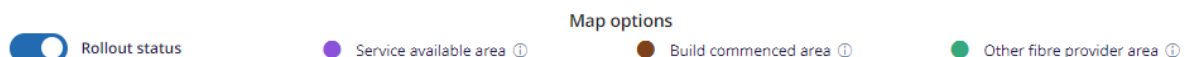
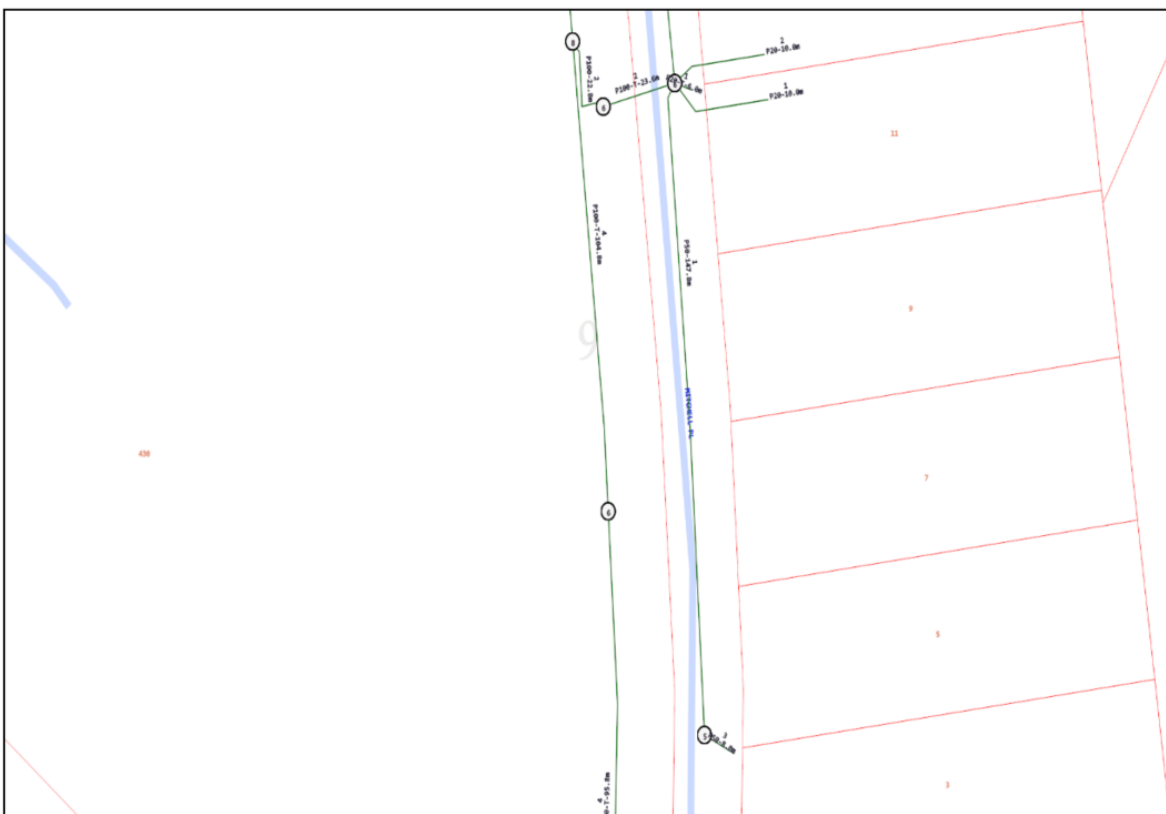
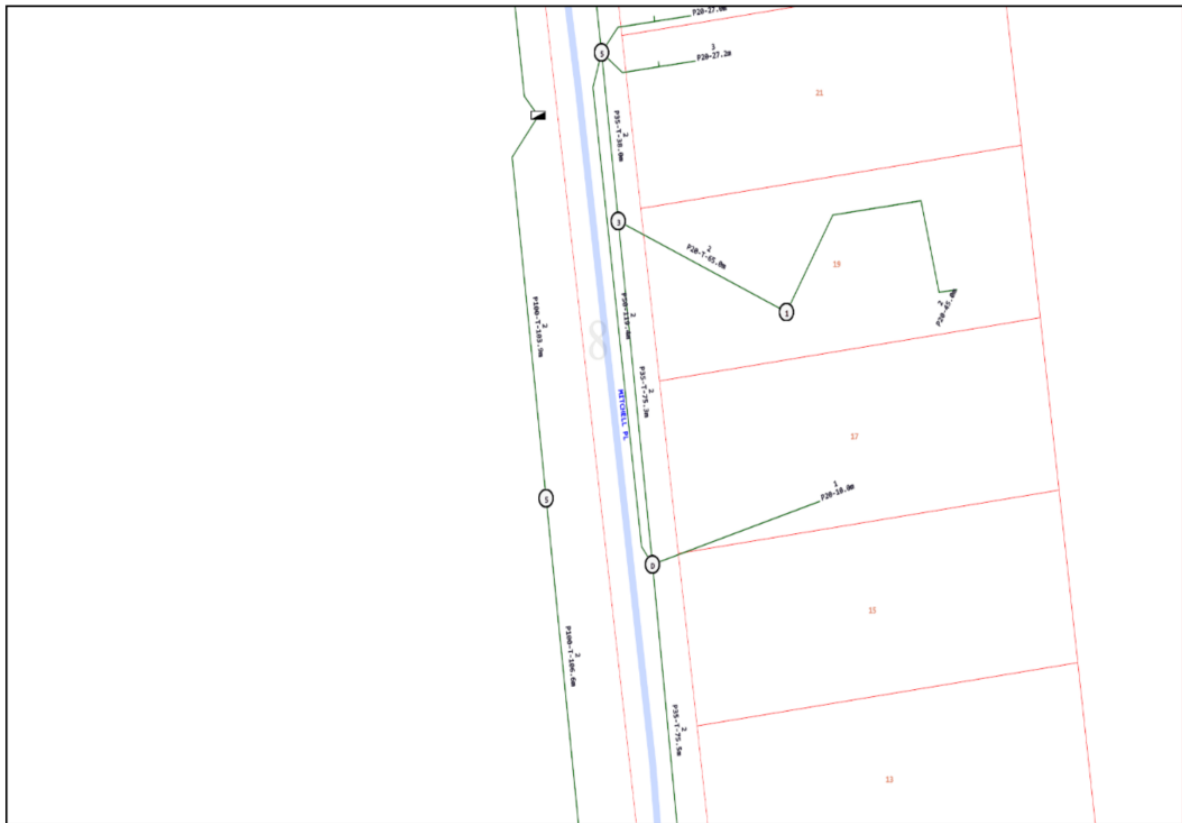


Image 5 - NBN Roll Out Map Showing Service Available

BESTEC®

BESTEC®

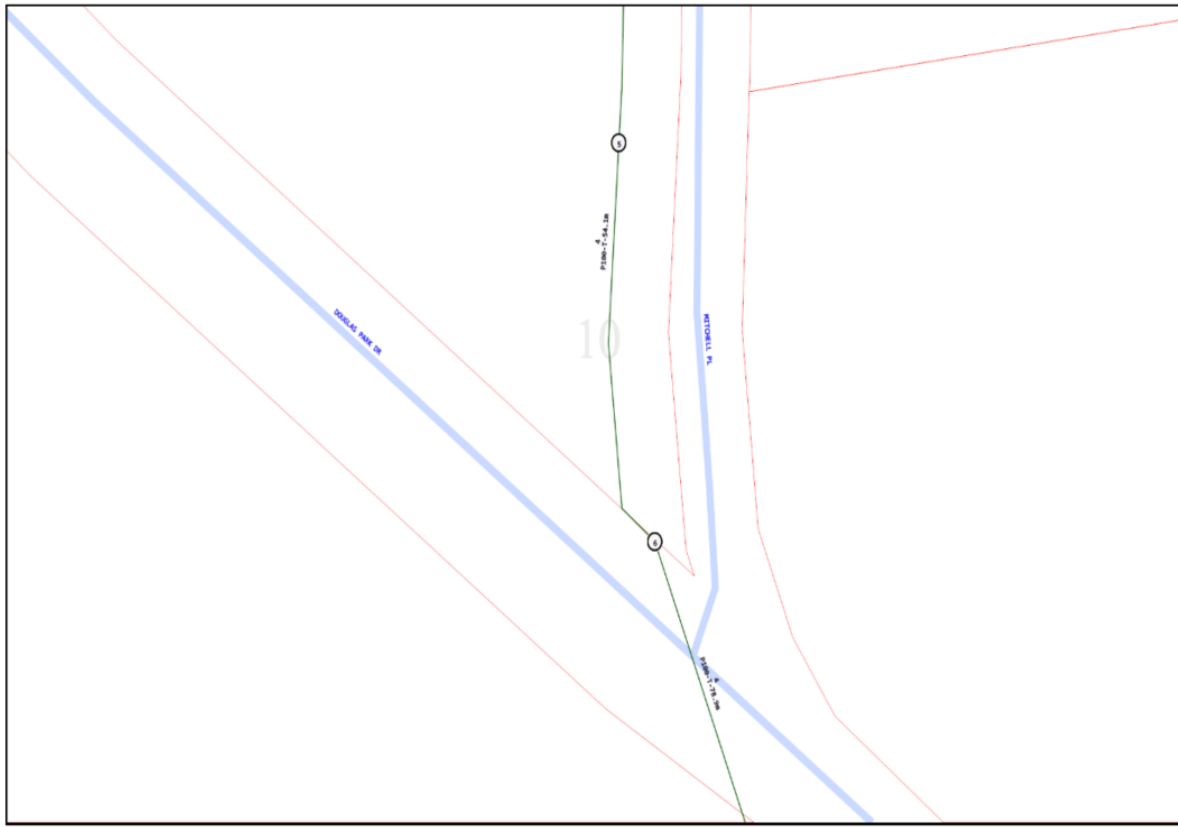


Image 6 – DBYD Plans Showing Existing NBN pipe and pits on Mitchell Place

5.2 Proposed Development Works (Power)

The proposed development consists of a Crematorium Building, Chapel Building, Administration Building and Storage Shed/Garage.

It is proposed that the site will be a fully electric site (to be further confirmed in the future stage where the service capacity and fuel source is to be confirmed).

Based on the proposed areas of the buildings and applying a diversified maximum demand analysis (in accordance with Australian Standard 3000 – Wiring Rules and using data from other developments) and including provision of power supplies to external building services such as water features, ponds, external lighting / car parking and general purpose power outlets for other services, eg: hydraulic/civil pumps, motorised gates etc, we have undertaken an electrical maximum demand. This analysis indicates that a required load of 900 Amps per phase (623 kVA) is required for the entire development.

This is broken up into a stage 1 load of approximately 230 Amps per phase and a final stage load of 670 Amps per phase.

This required load (both stage 1 and final) exceeds the current capacity in the existing pole mounted substations no's 10935 and 11467 located adjacent to the site (without upgrade).

As such, a preliminary enquiry request (reference ENL6588) was submitted to Endeavour Energy on 18 March 2025 by the ASP level 3 for the establishment of an upgraded supply to the site (900 Amps Per phase). Refer Appendix E for application and response.

Mr John Le, Customer Solutions Engineering Specialist from Endeavour Energy, replied via email dated 24 March 2025 and advised:-

- 1. There is sufficient capacity on adjacent 11kV W111 at this point in time to supply this application.**

2. Preference for the installed new 11kV 1000 PM substation with 2 FDR RMU to ring into conductor running along Mitchell PI, to establish inherent network backup in event of an outage, via two new HV UGOHs and cable.
3. Substation to have its switches automated.

As such, Endeavor Energy have confirmed that as at the time of application there is sufficient capacity in the high voltage existing networks (without any further upstream upgrade works) to provide High Voltage (HV) power to a new Endeavour Energy pad mounted substation located on site to provide the requested 900 Amps per phase.

5.2.1 Understanding ASP Works

In NSW, the power authority extension works are designed and installed by an accredited designer and installer known as an Accredited Service Provider (ASP).

The ASP acts as the conduit between the developer and the authority (Endeavour Energy).

There are 3 levels of ASP, Level 3 (design of endeavour energy assets), Level 2 (connection of private assets to endeavour energy assets and metering) and level 3 (construction of endeavour energy assets)

The ASP Level 3 provides the design of the contestable works (high voltage connection, conduits and transformer in accordance with Endeavour Energy design and installation standards. The ASP Level 3 designer as part of their works will undertake the following scope of work:-

- Make application for upgrade to Endeavour Energy
- Liaise with Endeavour energy to point of offer
- Design the infrastructure upgrade works as required to facilitate the new substation, including the substation.
- Submit and liaise with Endeavour energy for design sign off and approval

The ASP level 1 undertakes the installation of the Endeavour energy infrastructure in accordance with the ASP Level 3 Design. Installation and equipment selections are in accordance with the ASP Level 3 design and Endeavour Energy Design standards, including associated traffic management, safety in design and local approvals.

The ASP Level 2 makes the final connection of the installed consumers mains and retailer metering.

5.2.2 Authority Works (designed and delivered by the ASP)

The authority works identified to provide the requested 900 Amps per phase to the development is as follows (all completed as part of stage 1 works):-

- Review of all ASP design works and provision of approval
- Utilise existing high voltage cabling located on Mitchell Place
- Based on current capacity of the high voltage feeders no additional upstream works are required (at the time of application the feeders have sufficient capacity to deliver the requested 900Amps per phase)
- Creation of a new overhead connection to allow high voltage cabling to traverse down the pole to an inground conduit(s).
- New endeavour energy high voltage conduits from feeder connection point to the proposed transformer location.
- New high voltage cabling to transformer location located within the inground conduits

- New site kiosk transformer installed to Endeavour Energy standards, including associated footings and vault.
- Review of installation and switching on of power to the transformer.

As these works are contestable, they are fully funded by the developer.

5.2.3 Private Works from the Authority Connection point

- Via a registered surveyor, creation of associated HV cabling and transformer easement (to be approved by Endeavour Energy)
- The point of Electrical connection from Utility to private Electrical infrastructure will be the low voltage terminals of the pad mounted transformer. This connection will be rated to provide the requested load to the site. From this point the site private Electrical Services works will comprise internal site infrastructure as follows:-
 - New site main switchboard (MSB) located adjacent the Endeavour Energy Transformer
 - New in ground consumers mains cabling between the MSB and the transformer, including coordination with the ASP level 2 for consumers mains cabling termination and energisation.
 - New retailer meter panel located within the MSB, including coordination with the ASP level 2 for meter installation.
 - New inground submains cabling (and associated conduits and pits) between MSB and Storage Shed/Garage and between MSB and external electrical pillars located within the site to serve individual buildings and external site services
 - External electrical pillars (distribution boards)
 - Internal distribution boards within buildings
 - Conduits, cabling and lighting to serve the site.

All works, ASP Level 3 design, ASP Level 1 infrastructure installation, private electrical works installed by the developer and ASP Level 2 consumers mains connection and metering installation are coordinated and installed. An indicative methodology is noted below:-

1. ASP level 3 makes application
2. Endeavour energy approves application to design
3. ASP level 3 undertakes design for transformer and HV connection (this is expected to take in the order of 3 months – to be confirmed by the ASP designer when engaged)
4. Developer engages registered land surveyor to provide draft easement plans (transformer easement and HV cable easement) for Endeavour Energy Review and approval. This is funded by the developer.
5. Endeavor Energy approves design. Developer funds all associated Endeavour Energy review and approval costs.
6. Endeavour energy approves easement areas. Developer funds all associated Endeavour Energy review and approval costs.
7. Services consultant (private) designs all site electrical works (MSB, submains cabling, distribution boards etc)
8. Developer prices private works within the site to a registered electrical contractor. This is funded by the developer (private works)
9. Developer prices Endeavour Energy contestable works via the ASP Level 1. As all works are contestable works, this is funded by the developer
10. ASP level 1 acquires and installs transformer and HV cabling (this is expected to take in the order of 6 months – to be confirmed by the ASP installer when engaged). This includes:-
 - a. Civil works
 - b. Any road management
 - c. Delivery to site
 - d. Installation of transformer pad
 - e. Installation of all equipment

11. Endeavour Energy inspects and approves installation. Developer funds all associated Endeavour Energy review and approval costs.
12. All easement registered.
13. Electrical contractor installs MSB, meter panel and consumers mains cabling
14. ASP terminates cabling at transformer and installs metering
15. All downstream electrical services supplied and installed by the private electrical contractor, funded by the developer.

An indicative site infrastructure plan is provided in Appendix F detailing the proposed transformer location and main switchboard location.

Stage 1 works include:-

- New electricity point of supply (authority and ASP works as detailed above). This includes incoming HV cabling and conduits and site transformer
- Site main switchboard (MSB) with provisions for stage 1 and future stage works
- Conduit provisions (and pits) between the main switchboard and each stage 1 area distribution board serving stage 1 buildings and areas
- Conduit provisions capped at the stage 1 boundary for future stage areas
- Submains cabling between the MSB and each stage 1 distribution board
- Stage 1 building and area distribution boards
- Power and lighting cabling and fixtures associated with stage 1 buildings and areas

Future stage works include:-

- Extension of conduit provisions provided as part of stage 1 works
- Submains cabling between the MSB and each future distribution board
- Future stage building and area distribution boards
- Power and lighting cabling and fixtures associated with future stage buildings and areas

5.2.4 Impact of the Proposed Development

With the exception of the existing low voltage feed delivering overhead power to the existing residential property on the site all authority infrastructure is located external to the site (refer Existing Services Arrangement section of the report above). This existing residential supply will be removed and is considered low risk due to its size.

At the time of this report, the external high voltage feeders have sufficient capacity to provide the requested power to the site. Additionally, the proposed transformer location is within the site boundary and as such there is minimal impact on the service provider assets surrounding the site.

Existing overhead HV cabling will be extended and reticulated down a pole to the new pad mounted transformer via in ground cabling (i.e. extension of existing assets). The transformer will have automated switching and will facilitate a ring main unit allowing the 2 existing HV supplies to be connected and to establish inherent network backup in event of a power outage.

All new HV cabling (from pole location) will be inground, installed in conduits and buried with cover in accordance with Australian Standards and Endeavour Energy requirements, thus minimising visual impact to the neighbouring properties and increasing safety when working near the asset.

The above is as per the Endeavour Energy advice at the time of the report and is subject further confirmation at the time of detailed design.

The proposed buildings are located inbound to the site, well beyond the clearance requirements from overhead power lines stipulated in Appendix B and C (overhead power lines are external to the site and no buildings are located hard up to the property boundary).

In addition to the utility connection, on site power generation is proposed via roof mounted solar PV systems and electric battery storage. These are low noise producing power generators and are not

motor driven like a diesel generator or wind turbine, thus minimising the impact to the neighbouring properties.

All site lighting will be designed in accordance with Australian Standard 4282 - Control of the Obtrusive Effects of Outdoor Lighting minimising light spill and glare to neighbouring properties in accordance with Australian Standards.

5.3 Proposed Development Works (Communications)

The availability of Communications to the site is fulfilled via existing services located in Mitchell Place and we see no major issues with establishing a new NBN connection for the proposed development provided as an extension to the existing pit and pipe infrastructure to a connection point within the proposed site.

In establishing a new connection the following methodology it is proposed:-

- Make application to the NBN Portal (by the developer).
- NBN assess the application and provide a contract agreement. Given the site is a single connection (i.e. not a multi dwelling site) and the fact that NBN is in the area we expect no issues with obtaining this.
- We expect a cost in the order of \$600 for the NBN connection, to be paid by the developer.
- Developer undertakes pit and pipe design in accordance with NBN design standards.
- Design is uploaded to the NBN portal.
- Any corrective action requests are undertaken to point of approval by NBN.
- A private communications contractor installs all conduits and pits within the site in accordance with the approved design. This is funded by the developer.
- Once pit and pipe installation is complete within the site an NBN arranged contractor installs any conduits from the site boundary to the nearest pit.
- The NBN arranged contractor then installs all fibre and main connection points (network termination device).
- From the network termination device all cabling is then private infrastructure within the site and is installed and funded by the developer.
- To establish the connection, the developer will engage a service provider to connect an internet service to the site via the installed NBN infrastructure.

As there is existing NBN adjacent to the site the impact to the existing authority infrastructure is minimal (the design is expected to be an extension from an existing pit into site).

Stage 1 works include:-

- Site applications
- NBN pathways to initial building (conduit and pit provisions from street)
- NBN cable installation and point of connection
- Private communications cabling and cabinets from this point of connection to each building installed as part of stage 1 works
- Site conduits to facilitate future stages

Future stage works include:-

- Extension of conduit provisions installed as part of stage 1 to serve future stages
- Private communications cabling and cabinets from stage 1 to each building installed as part of stage 2 works

6 Hydraulic Services

6.1 Existing Services Arrangement

6.1.1 Water Supply

Water supply infrastructure to the area is provided by Sydney Water.

A 200mm diameter Ductile Iron Cement Lined (DICL) water main is present abutting the property boundary within Mitchell Place.

A branch tapping and water meter assembly is proposed from the above mentioned main to service the development.

6.1.2 Sewer Drainage

Sewer drainage infrastructure to the district is provided by Sydney Water.

Sewer drainage infrastructure is not present in the vicinity of the proposed development.

An onsite wastewater treatment and holding system is proposed with wastewater being removed from site via tanker.

6.1.2 Natural Gas Supply

It is proposed that the site will be a fully electric site, not requiring the connection of a natural gas supply.

This is to be further confirmed in the future stage where service capacity, requirements and availability of an all-electric solution will be further confirmed.

Natural gas infrastructure is not present in the vicinity of the proposed development.

Should further confirmation pertaining to the crematorium solution result in the need for a gas source, it is proposed that an onsite Liquified Petroleum Gas (LPG) storage vessel will be placed on site. This removes the need for external and internal infrastructure upgrades to provide a gas source to the site.

Truck access will be provided to allow periodic refilling based on consumption.

6.2 Proposed Development Works

6.2.1 Authority Works – Water Supply

The following authority works are to be provided by Sydney Water:-

- Provision of a 150mm diameter branch tapping from the existing 200mm diameter water main located within Mitchell Place.
- Provision of a 50mm diameter water meter assembly for domestic water purposes
- Provision of a 150mm diameter water meter assembly for fire protection water purposes.

A 'Building Plan Assessment' application was made through the Sydney Water Tap in portal and it was confirmed by Sydney Water that the proposed structures would not impact or affect Sydney Water assets.

A statement of available pressure and flow was applied for and received from Sydney Water. The available pressure and flow within the existing Sydney Water main is adequate to supply the project domestic and fire protection water requirements without the need for onsite water storage tanks or pumps.

Refer Appendix H for Sydney Water correspondence.

A water connection application has been made to Sydney Water.

Sydney Water are currently processing a section 73 compliance certificate to verify that the proposed development will be provided with adequate water supply.

Water usage within the development is minor and estimated to be in the order of 2.0 litres / second when calculated using probable simultaneous design calculation charts contained within AS 3500.1 - Water Services.

It is not expected that a probable instantaneous maximum demand of 2.0 litres / second will have a detrimental impact on a supply main of 200mm diameter.

No authority infrastructure augmentation or upgrade is required to service the proposed development.

All of the above-mentioned works are provided as part of stage 1.

6.2.2 Authority Works – Sewer Drainage

No authority sewer drainage works are proposed given that the site is not serviced via reticulated authority sewer drainage infrastructure.

6.2.3 Private Sewer Drainage

Sewer drainage will extend, below ground, under gravity conditions from each building to a below ground aerobic septic tank of nominal 6,000 litre capacity.

Wastewater outflow from the septic system will discharge under gravity conditions to a below ground 50,000 litre wastewater holding tank.

The septic tank and wastewater holding tank will be positioned below ground, adjacent the Storage Shed/Garage building.

Design and sizing of the wastewater system has been undertaken by 'Strategic Environmental Engineering Consulting (SEEC)'.

The wastewater management report is included as an Appendix (Appendix G) at the end of this report.

Stage 1 works include:-

- Construction of waste water treatment plant
- Below ground gravity sewer drainage extending from stage 1 buildings to waste water treatment plant
- Provision of future stage connection stub to serve future stage areas
- Internal plumbing drainage works and fit off of fixtures and fittings within stage 1 buildings

Future stage works include:-

- Extension of below ground gravity sewer drainage extending from future stage buildings to stub provisions provided as part of stage 1 works.
- Internal plumbing drainage works and fit off of fixtures and fittings within future stage buildings

6.2.4 Private Domestic Water Reticulation

Domestic water reticulation pipework will extend from the Sydney Water meter located at the property boundary adjacent Mitchell Place and will extend below ground to all buildings and to landscape water supply points

A backflow prevention device will be provided at the property boundary to reduce the risk of cross contamination from the private water reticulation network back into the authority water main.

No onsite water storage tanks and pumps are required to service the domestic water reticulation network.

Stage 1 works include:-

- Connection to and extension from authority water meter assembly at property boundary to stage 1 buildings, roadways and pathways.
- Provision of valved isolation points to serve future stage areas.
- Internal water reticulation pipework and fit off of sanitary fixtures and fittings serving stage 1 buildings.

Future stage works include:-

- Extension of below ground plumbing reticulation pipework extending from future stage buildings to valve connections provided as part of stage 1 works.
- Internal plumbing reticulation works and fit off of fixtures and fittings within future stage buildings.

6.2.5 Private Fire Protection Services

Fire protection services water reticulation pipework will extend from the Sydney Water meter located at the property boundary adjacent Mitchell Place and will extend below ground to a series of above ground fire hydrants position along the internal road network and adjacent buildings.

Statement of available pressure of flow information received from Sydney water confirms that no hydrant booster assembly or on site tanks and pumps are required to satisfy the design requirements of the fire hydrants.

Stage 1 works include:-

- Connection to and extension from authority water meter assembly at property boundary to fire hydrant stand pipes located adjacent roadways and buildings forming part of the stage 1 area.
- Provision of valved isolation stubs to serve future stage areas.

Future stage works include:-

- Extension of below ground fire protection services pipework extending from future stage areas and buildings to valve connection stubs provided as part of stage 1 works.
- Provision of fire hydrant stand pipes located adjacent roadways and buildings forming part of the future stage areas.

6.2.6 Private Natural Gas Reticulation

No authority natural gas infrastructure is present in the vicinity of the site, as such natural gas is not proposed to be provided to the site.

The development is proposed to be served with all electric infrastructure and items of plant and equipment.

7 Response to Services Related Referral Agency Advice Items

We refer to the Referral Authority Agency Advice Notice provided for the Secretary's Environmental Assessment Requirements (SEARs) and provide return comment in blue on the items that relate to the Building Services and associated infrastructure.

Wollondilly Shire Council comments on the Scoping Report prepared by Ethos Urban via letter dated 26 March 2024

7. Utilities

It is unclear if the proposal will require bulk infrastructure to be upgraded, especially water, sewer and electricity. This needs to be explored as it may require appropriate licences/approvals. Alternatively, if power is generated onsite, this has to be accounted for in the noise assessment report as part of the EIS.

Refer Section 5 and 6 of this report for infrastructure summary.

Noise associated with onsite power will be mitigated by the use of low noise emitting generating sources (such as solar PV systems and electric battery storage). These systems will have associated inverters and battery units located at or in the inbound building locations away from the site boundary. No generators or motor driven sources of onsite power generation have been proposed

EPA comments and recommendations on the SEARs requirements via letter dated 19 March 2024

Cremator Exhaust Stack Emissions

The exhaust stack must comply with the prescribed standards for concentration of air impurities set-out in the Protection of the Environment Operations (Clean Air) Regulation 2021 (the standards of concentration for Group C Plant prescribed in Schedule 6 of the Regulation would apply).

The formation and release of polychlorinated dibenzo-p-dioxins (PCDD), polychlorinated dibenzofurans (PCDF), polychlorinated biphenyl (PCB) and hexachlorobenzene (HCB) from cremators is possible due to the presence of these materials, precursors and chlorine in the cadaver and in some co-combusted plastics. PCDD, PCDF, PCB and HCB are listed in Annex C of the Stockholm Convention. Crematoria are listed in Part III of the Stockholm Convention as a possible unintentional source of PCDD, PCDF, PCB and HCB.

Article 5 of the Stockholm Convention requires measures to be taken to reduce the total releases derived from anthropogenic sources of each of the chemicals listed in Annex C, with the goal of their continuing minimisation and, where feasible, ultimate elimination. One such measure is the promotion of best available techniques (BAT) and best environmental practices (BEP). Guidance on BAT and BEP for cremators can be found in

https://chm.pops.int/Portals/0/Repository/batbep_guidelines/UNEP-POPS-BATBEP-GUIDE-08-EN-12.English.PDF (the guidance document).

The applicant should demonstrate that best available techniques for emissions control will be used. The Secretariat of the Stockholm Convention on Persistent Organic Pollutants has published best practice guidelines for crematoria.

The key recommendations include:

- Minimum furnace temperature (850 °C), residence time in the second chamber (2 seconds for combustion gases) and enough air (e.g., 6% O₂ by volume) to ensure combustion in the second chamber and avoid generating products of incomplete combustion;
- Suitable air pollution control equipment, which could include temperature controls, dust control, carbon injection, fabric filtration, air tightness of combustion chambers and casings;

- Monitoring of gas temperature and flue gas O₂ and CO concentrations, application of relevant emission limit values and additional monitoring, including ambient monitoring of soil and air in the proximity of crematoria;
- Avoidance of use of PVC, metals and chlorinated compounds in coffins and fittings;
- Operational controls, inspection and preventive maintenance.
- The final design of the cremator exhaust stack should consider the USEPA's Guideline for the Determination of Good Engineering Stack Height (1981). The height of the stack should be sufficient to minimise building downwash and ensure adequate pollutant dispersion is achieved. Air dispersion modelling is an effective tool for optimising the release parameters (for e.g. stack height and flow rate).
- Should emission verification be required, the design of the cremator exhaust stack should also consider the requirements outlined in Australian Standard AS4323.1: Stationary source emissions - Selection of sampling positions (2021).

The above recommendations are noted and will be considered further in the future stage where the cremator supplier and crematorium operator will confirm specific requirements. All design will be in accordance with the requirements of the applicable Australian Standards and building code requirements.

8 Conclusion

Existing Authority Services infrastructure exists adjacent to the subject site including:-

- High voltage and low voltage overhead power lines (Mitchell Place)
- NBN inground services (Mitchell Place)
- Water main (Mitchell Place).

The site currently has no authority Services infrastructure provisions for the following:-

- Sewer
- Natural Gas

The proposed development requires a power supply in the order of 900 Amps per phase. This supply cannot be served via the existing pole mounted substation located adjacent to the site and as such a new pad mounted external transformer is required for the site. This substation will sit within the property boundary and be connected to the existing high voltage cabling located external to the site. Endeavour Energy has confirmed that the existing high voltage cabling and infrastructure has capacity for the requested load and as such there is minimal impact to the existing Endeavour Energy infrastructure.

Communications to the site will be via a new NBN Co connection. This will be served via an extension to the existing NBN Co infrastructure located in Mitchell Place. All new NBN Co pit and pipe pathways within the site will be designed and installed in accordance with NBN Co guidelines. This will be extended from the boundary to the closest pit on Mitchell Place by NBN Co. Based on information received to date there will be minimal impact to the existing NBN Co infrastructure.

Water to the site will be derived from the existing 200mm diameter Sydney Water main located within Mitchell Place. A new branch tapping, domestic meter and fire protection services meter will be provided to serve the site. No authority infrastructure augmentation or upgrade is required to service the proposed development.

As no Sewer infrastructure is present adjacent the site, it is proposed that the site will be serviced via a wastewater treatment system within the site. A design solution has been proposed by Strategic Environmental and Engineering Consulting and their recommendations for the solution within the site are summarised in Appendix G of this report.

It is proposed that the site will be a fully electric site, not requiring the connection of a natural gas supply. This is to be further confirmed in the future stage where service capacity, requirements and availability of an all-electric solution will be further confirmed. Natural gas infrastructure is not present in the vicinity of the proposed development. Should further confirmation pertaining to the crematorium solution result in the need for a gas source, it is proposed that an onsite Liquefied Petroleum Gas (LPG) storage vessel will be placed on site. This removes the need for external and internal infrastructure upgrade and creation to provide a gas source to the site.

Based on the above we confirm that the site is serviceable without major impact to existing authority infrastructure.

9 Mitigation Measures

The following table provides a consolidated summary of the mitigation measures identified in the report each and the relevant section of the report that addresses the item.

Project Stage Design (D), Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
	<i>In consultation with relevant service providers and associated accredited Utility Designers (such as ASP Level 3 for Power):-</i>	
D/C	Endeavour Energy design and construction works that impact on the roads or road reserves outside of the property boundary to incorporate appropriate approvals, notifications and traffic management in accordance with Endeavour Energy Standards	See Section 5.2.1
D/O	Excessive noise to neighboring properties from the generation of onsite power will be mitigated by the use of low noise emitting generating sources (such as solar PV systems and electric battery storage). These systems will have associated inverters and battery units located at or in the inbound building locations away from the site boundary. No generators or motor driven sources of onsite power generation have been proposed.	See Section 5.2.4,
D/O	Effect of onsite water treatment runoff affecting neighboring properties – Waste water will be collected within a holding tank and removed from site via tanker rather than disposed of above or below ground on site	See Section 6.2.3
D/C/O	New Building proximity to high voltage power infrastructure – all new HV cables and transformers will sit within the required easement areas. All new buildings are inbound to the site away from overhead power lines that are located external to the site boundary. All new electrical cabling will be inground.	See Section 5.2.2, 5.2.3, 5.2.4
O	Continuity of power supply – Advice from Endeavour Energy is that the new transformer will incorporate automated switching to create network backup, minimizing risk of power outage.	See Section 5.2
D/O	Light spill to neighboring properties mitigated by designing to Australian Standard 4282 - Control of the Obtrusive Effects of Outdoor Lighting	See Section 5.2.4

Appendix A – Dial Before You Dig Drawings

BYDA Underground Search Report

Date: 14/05/2024

BYDA Sequence No: 239182313

BYDA Job No: 36673532

ENDEAVOUR ENERGY ASSETS NOT AFFECTED

To:	John Truong	Company:	BESTEC
Address:	175-177 Flinders Lane, Melbourne, VIC 3000		
Cust. ID:	3130116	Email:	2vcex7qhzsg66f.7lsnrq9ccqo1vc@smarterwx-mail.byda.com.au
Phone:	+61437852288		
Enquiry Location: 430-490 Douglas Park Dr, Douglas Park, NSW 2569			

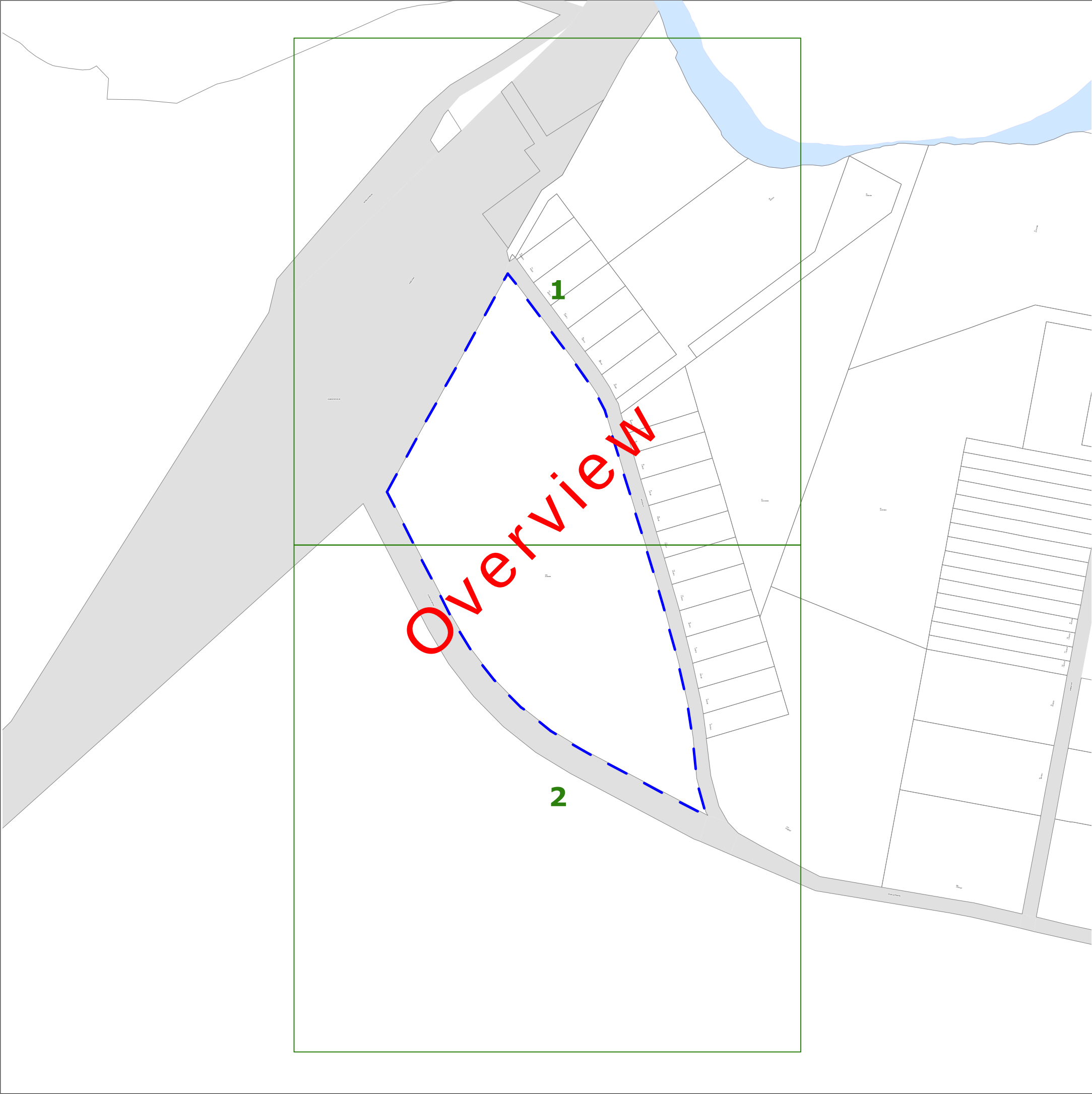
Our Search has shown that **NO UNDERGROUND ASSETS ARE PRESENT** on our plans within the nominated enquiry location. However all persons planning excavation shall read and understand the warnings below. This search is based on the graphical position of the excavation site as denoted in the BYDA customer confirmation sheet.

WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- Underground assets may be congested at the approach to bridges and other structures. Typical asset depths and alignment may vary substantially, rising and falling sharply and at much shallower depths than elsewhere as they are channelled into shared allocated spaces on bridges and other structures. Additional precautions and underground asset location methods will be required in proximity to bridges and other structures.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be made available at the worksite where excavation is to be undertaken in either printed or electronic format. If the plans are in an electronic format, they must be in a format visible on a screen size 10 inches or greater. Plans must be reviewed and understood by the crew on site prior to commencing excavation.
- Non-destructive water excavation must be operated at or below 2000PSI. Any operation exceeding 2000PSI must be classed and treated as a destructive excavation practice

SUPPLEMENTARY MATERIAL

Material	Purpose	Location
BYD Cover Letter	Endeavour Energy BYD response Cover Letter	Attached
BYD Important Information & Disclaimer	Endeavour Energy disclaimer, responsibilities and information on understanding plans	Attached
BYD Response Plans	Endeavour Energy BYD plans	Attached
Work Cover NSW "Work near underground assets: Guide"	Guideline for anyone involved in construction work near underground assets	Contact Work Cover NSW for a copy
Work Cover NSW "Excavation work: Code of practice"	Practical guidance on managing health and safety risks associated with excavation	URL [Click Here]
Safe Work Australia "Working in the vicinity of overhead and underground electric lines guidance material"	Provides information on how to manage risks when working in the vicinity of overhead and underground electric lines at a workplace	URL [Click Here]
Endeavour Energy Safety Brochures & Guides	To raise awareness of dangers of working on or near Endeavour Energy's assets	URL [Click Here]



- WARNING**
- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
 - Underground assets may be congested at the approach to bridges and other structures. Typical asset depths and alignment may vary substantially, rising and falling sharply and at much shallower depths than elsewhere as they are channelled into shared allocated spaces on bridges and other structures. Additional precautions and underground asset location methods will be required in proximity to bridges and other structures.
 - In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
 - The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
 - The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
 - Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
 - Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
 - Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
 - Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
 - All plans must be made available at the worksite where excavation is to be undertaken in either printed or electronic format. If the plans are in an electronic format, they must be in a format visible on a screen size 10 inches or greater. Plans must be reviewed and understood by the crew on site prior to commencing excavation.
 - Non-destructive water excavation must be operated at or below 2000PSI. Any operation exceeding 2000PSI must be classed and treated as a destructive excavation practice

- INFORMATION PROVIDED BY ENDEAVOUR ENERGY**
- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
 - Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
 - Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
 - All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

-  or 

 Street light column
-  Padmount substation
-  or 

 Overground pillar (O.G.Box)
-  Underground pit
-  Duct run
-  Cable run
-  Typical duct section
-  Asbestos warning



NOT TO SCALE

BYDA Sequence No.:	239182313
Issued Date:	14/05/2024

WARNING

- All electrical apparatus shall be regarded as live until proved de-energised. Contact with live electrical apparatus will cause severe injury or death.
- Underground assets may be congested at the approach to bridges and other structures. Typical asset depths and alignment may vary substantially, rising and falling sharply and at much shallower depths than elsewhere as they are channelled into shared allocated spaces on bridges and other structures. Additional precautions and underground asset location methods will be required in proximity to bridges and other structures.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty (20) working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be made available at the worksite where excavation is to be undertaken in either printed or electronic format. If the plans are in an electronic format, they must be in a format visible on a screen size 10 inches or greater. Plans must be reviewed and understood by the crew on site prior to commencing excavation.
- Non-destructive water excavation must be operated at or below 2000PSI. Any operation exceeding 2000PSI must be classed and treated as a destructive excavation practice

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

-  or 

Street light column
- 

Padmount substation
-  or 

Overground pillar (O.G.Box)
- 

Underground pit
- 

Duct run
- 

Cable run
- 

Typical duct section
- 

Asbestos warning



NOT TO SCALE

BYDA Sequence No.:	239182313
Issued Date:	14/05/2024

Cadastre: © Land and Property Information 2015, 2016

WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- Underground assets may be congested at the approach to bridges and other structures. Typical asset depths and alignment may vary substantially, rising and falling sharply and at much shallower depths than elsewhere as they are channelled into shared allocated spaces on bridges and other structures. Additional precautions and underground asset location methods will be required in proximity to bridges and other structures.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be made available at the worksite where excavation is to be undertaken in either printed or electronic format. If the plans are in an electronic format, they must be in a format visible on a screen size 10 inches or greater. Plans must be reviewed and understood by the crew on site prior to commencing excavation.
- Non-destructive water excavation must be operated at or below 2000PSI. Any operation exceeding 2000PSI must be classed and treated as a destructive excavation practice

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

-  or 

 Street light column
- 
- Padmount substation

 or 

 Overground pillar (O.G.Box)

NOT TO SCALE

BYDA Sequence No.:	239182313
Issued Date:	14/05/2024

Guide to reading Sydney Water Before You Dig Plans

This guide will help you understand our plans and what our services are.

Sewer		Property Details	
Sewer Main (with flow arrow & size type text)		Boundary Line	
Disused Main		Easement Line	
Rising Main		House Number	
Maintenance Hole (with upstream depth to invert)		Lot Number	
Sub-surface chamber		Proposed Land	
Maintenance Hole with Overflow chamber		Sydney Water Heritage Site (please call 132 092 and ask for the Heritage Unit)	
Ventshaft EDUCT			
Ventshaft INDUCT			
Property Connection Point (with chainage to downstream MH)			
Concrete Encased Section			
Terminal Maintenance Shaft			
Maintenance Shaft			
Rodding Point			
Lamphole			
Vertical			
Pumping Station			
Sewer Rehabilitation			
Pressure Sewer		Water	
Pressure Sewer Main		WaterMain - Potable (with size type text)	
Pump Unit (Alarm, Electrical Cable, Pump Unit)		Disconnected Main - Potable	
Property Valve Boundary Assembly		Proposed Main - Potable	
Stop Valve		Water Main - Recycled	
Reducer / Taper		Special Supply Conditions - Potable	
Flushing Point		Special Supply Conditions - Recycled	
Vacuum Sewer		Restrained Joints - Potable	
Pressure Sewer Main		Restrained Joints - Recycled	
Division Valve		Hydrant	
Vacuum Chamber		Maintenance Hole	
Clean Out Point		Stop Valve	
Stormwater		Stop Valve with By-pass	
Stormwater Pipe		Stop Valve with Tapers	
Stormwater Channel		Closed Stop Valve	
Stormwater Gully		Air Valve	
Stormwater Maintenance Hole		Valve	
		Scour	
		Reducer / Taper	
		Vertical Bends	
		Reservoir	
		Recycled Water is shown as per Potable above. Colour as indicated	
Private Mains		Potable Water Main	
		Recycled Water Main	
		Sewer Main	
		Symbols for Private Mains shown grey	

Pipe types

ABS	Acrylonitrile Butadiene Styrene	AC	Asbestos Cement
BRICK	Brick	CI	Cast Iron
CICL	Cast Iron Cement Lined	CONC	Concrete
COPPER	Copper	DI	Ductile Iron
DICL	Ductile Iron Cement (mortar) Lined	DIPL	Ductile Iron Polymeric Lined
EW	Earthenware	FIBG	Fibreglass
FL BAR	Forged Locking Bar	GI	Galvanised Iron
GRP	Glass Reinforced Plastics	HDPE	High Density Polyethylene
MS	Mild Steel	MSCL	Mild Steel Cement Lined
PE	Polyethylene	PC	Polymer Concrete
PP	Polypropylene	PVC	Polyvinylchloride
PVC - M	Polyvinylchloride, Modified	PVC - O	Polyvinylchloride, Oriented
PVC - U	Polyvinylchloride, Unplasticised	RC	Reinforced Concrete
RC-PL	Reinforced Concrete Plastics Lined	S	Steel
SCL	Steel Cement (mortar) Lined	SCL IBL	Steel Cement Lined Internal Bitumen
SGW	Salt Glazed Ware	SPL	Steel Polymeric Lined
SS	Stainless Steel	STONE	Stone
VC	Vitrified Clay	WI	Wrought Iron
WS	Woodstave		

In an emergency, or to notify Sydney Water of damage or threats to its structures, call 13 20 90 (24 hours, 7 days)

Further information and guidance is available in the 'Plumbing, building and developing' section of Sydney Water's website at www.sydneywater.com.au, where you will find the following under 'Before You Dig':

- Essential references
 - Avoid Damaging Water and Sewer Pipelines
 - Important Information about Before You Dig
 - Technical guidelines: Building over and adjacent to pipe assets
- See Also
 - Building over or next to assets, section of Sydney Water's website at www.sydneywater.com.au

Or call **13 20 92** for Customer Enquiries.

Note: The lodging of enquiries via www.byda.com.au will enable you to receive, via email, colour plans in PDF format 24 hours a day, 7 days a week.

This communication is confidential. If you are not the intended recipient, please destroy all copies immediately. Sydney Water Corporation prohibits unauthorised copying or distribution of this communication.

Important information about You Dig

Before

The material provided or made available to you by Sydney Water (including on the Sydney Water website) in relation to your Before You Dig enquiry (Information) is provided on each of the following conditions, which you are taken to have accepted by using the Information:

- 1 The Information has been generated by an automated system based on the area highlighted in the  Equal. It is your responsibility to ensure that the dig site is properly defined when submitting your Before You Dig enquiry and, if the Information does not match the dig site, to resubmit your enquiry for the correct dig site.
- 2 Neither Sydney Water nor Before You Dig make any representation or give any guarantee, warranty or undertaking (express or implied) as to the currency, accuracy, completeness, effectiveness or reliability of the Information. The Information, including Sydney Water plans and work-as-executed diagrams, amongst other things:
 - (a)  to newer developments and in relation to structures owned by parties who do not participate in the Before You Dig service;
 - (b) may be out of date and not show changes to surface levels, road alignments, fences, buildings and the like;
 - (c) is approximate only and is therefore not suitable for scaling purposes; and
 - (d) does not show locations of property services (often called house service lines) belonging to or  FRQQ
- 3 You are responsible for, amongst other things:
 - (a)  hand-held tools or vacuum techniques so as to determine the precise location and extent of structures before any mechanical means of excavation are used;
 - (b) the safe and proper excavation of and for underground works and structures, including having regard to the fact that asbestos cement pipelines, which can pose a risk to health, may form  SDUW RI 6\GQH\ :DWHU¶V ZDWHU DQG; VHZHUDJH UHWLFXODWLRQ
 - (c)  SURWHFWLQJ XQGHUJURXQG VWUXFWXUHV LQFOXGLQJ 6\GQH\ interference;
 - (d) maintaining minimum cleara  QFHV EHWZHHQ 6\GQH\ :DWHU¶V VWUXFWXUHV D to others;
 - (e)  HQVXULQJ WKDW EDFNIOOLQJ RI H\FDYDWLRQ ZRUN LQ WKH YLF ZLWK 6\GQH\ :DWHU¶V VWDQGDUGV FRQWDLQH RQYUWV ZHEVLW
 - (f) notifying Sydney Water immediately of any damage caused or threat of damage to Sydney  :DWHU¶V V;WUXFWXUHV
 - (g) ensuring that plans are approved by Sydney Water (usually signified by stamping) prior to landscaping or building over or in the vicinity of any Sydney Water structure;
 - (h) ensuring that the Information is used only for the purposes for which Sydney Water and Before You Dig intended.

- 4 You acknowledge that you use the Information at your own risk. In consideration for the provision of the Before You Dig service and the Information by Sydney Water and Before You Dig, to the fullest extent permitted by law
 - (a) all conditions and guarantees concerning the Information (whether as to quality, outcome, fitness, care, skill or otherwise) expressed or implied by statute, common law, equity, trade, custom or usage or otherwise are expressly excluded and to the extent that those statutory guarantees cannot be excluded, the liability of Sydney Water and Before You Dig to you is limited to either of the following as nominated by Sydney Water in its discretion, which you agree is your only remedy:
 - (i) the supplying of the Information again; or
 - (ii) payment of the cost of having the Information supplied again;
 - (b) in no event will Sydney Water or Before You Dig be liable for, and you release Sydney Water and Before You Dig from, any Loss arising from or in connection with the Information, including the use of or inability to use the Information and delay in the provision of the Information:
 - (i) whether arising under statute or in contract, tort or any other legal doctrine, including any negligent act, omission or default (including willful default) by Sydney Water or Before You Dig; and
 - (ii) regardless of whether Sydney Water or Before You Dig are or ought to have been aware of, or advised of, the possibility of such loss, costs or damages;
 - (c) you will indemnify Sydney Water and Before You Dig against any Loss arising from or in connection with Sydney Water providing incorrect or incomplete information to you in connection with the Before You Dig service; and
 - (d) you assume all risks associated with the use of the Before You Dig and Sydney Water websites, including risk to your computer, software or data being damaged by any virus, and you release and discharge Sydney Water and Before You Dig from all Loss which might arise in respect of your use of the websites.

- 5 Sydney Water and Before You Dig Australia and its employees, agents, representatives and subcontractors shall not be liable to you for any loss, cost, expense, claim, liability or damage (including arising in connection with personal injury, death or any damage to or loss of property and economic or consequential loss, lost profits, loss of revenue, loss of management time, opportunity costs or special damages). To the extent of any inconsistency, the conditions in this document will prevail over any other information provided to you by Sydney Water and Before You Dig.

In an emergency, or to notify Sydney Water of damage or threats to its structures, call 13 20 90 (24 hours, 7 days)

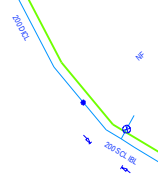
Further information and guidance is available in the www.sydneywater.com.au section of the Sydney Water Corporation website. You Dig It.

- Essential references
 - Guide to Reading Sydney Water BYDA Plans
 - Avoid Damaging Water and Sewer Pipelines
 - Technical guidelines: Building over and adjacent to pipe assets
- See Also
 - Building over or next to assets www.sydneywater.com.au

Or call 13 20 92 for Customer Enquiries.

Note: The lodging of enquiries via www.byda.com.au will enable you to receive, via email, colour plans in PDF format 24 hours a day, 7 days a week.

This communication is confidential. If you are not the intended recipient, please destroy all copies immediately. Sydney Water Corporation prohibits unauthorised copying or distribution of this communication.



DBYD Address:
430-490 Douglas Park Dr
Douglas Park NSW 2569

DBYD Job No: 36673532

DBYD Sequence No: 239182316

Copyright Reserved Sydney Water 2024
No warranty is given that the information shown is complete or accurate.
SYDNEY WATER CORPORATION

Scale: 1:2000

Date of Production: 14/05/2024



Plan 2 of 2



Appendix B – Work Near Overhead Power Lines - Code of Practice

WORK NEAR OVERHEAD POWER LINES

CODE OF PRACTICE 2006

Disclaimer

This publication may contain occupational health and safety and workers compensation information. It may include some of your obligations under the various legislations that WorkCover NSW administers. To ensure you comply with your legal obligations you must refer to the appropriate legislation.

Information on the latest laws can be checked by visiting the NSW legislation website (www.legislation.nsw.gov.au) or by contacting the free hotline service on 02 9321 3333.

This publication does not represent a comprehensive statement of the law as it applies to particular problems or to individuals or as a substitute for legal advice. You should seek independent legal advice if you need assistance on the application of the law to your situation.

CONTENTS	PAGE
WHAT IS AN INDUSTRY CODE OF PRACTICE?	4
PREFACE	5
WHAT IS WORK NEAR OVERHEAD POWER LINES?	5
PERSONNEL WORKING NEAR OVERHEAD POWER LINES	5
HOW CAN WORKING NEAR LIVE OVERHEAD POWER LINES BE DANGEROUS?	6
WHAT DO THE SYMBOLS IN THE CODE OF PRACTICE MEAN?	6
ACKNOWLEDGEMENT	6
CHAPTER 1 – ESTABLISHMENT	7
1.1 Title	7
1.2 Purpose	7
1.3 Scope	7
1.4 Authority	8
1.5 Commencement	8
1.6 Interpretation	8
1.7 Applicable legislation	8
1.8 Definitions	9
CHAPTER 2 – CONSULTATION AND RISK MANAGEMENT	14
2.1 Consultation at the workplace	14
2.1.1 Consultation arrangements	15
2.1.2 Consultation procedures	15
2.1.3 When should consultation be undertaken?	15
2.1.4 How should consultation be undertaken?	16
2.2 Risk management at the workplace	16
2.2.1 Identify hazards	16
2.2.2 Assess risks	17
2.2.3 Eliminate or control the risk	17
2.2.4 Review risk assessment and control measures	18
2.3 Information, instruction, training and supervision	18
2.4 Provision of information	18
2.4.1 Safe work method statements	19
2.5 Preparation for work to commence	19
CHAPTER 3 – APPROACH DISTANCES WHEN WORKING NEAR OVERHEAD POWER LINES	20
3.1 Scope	20
3.2 Basis of approach distances?	20
3.2.1 Assessing the relevant approach distance	20
3.2.2 Increases to approach distances	22
3.2.3 How close can I go to overhead power lines?	22

3.3	Ordinary Person Zone	23
3.4	Accredited Person Zone	23
3.5	Work inside the No Go Zone – Approval of the network operator	25
3.6	Approach Distances for Vehicles	25
3.7	Work near overhead power lines – General risk management principles	26
3.8	Competence and knowledge of this code	27
3.8.1	Training and Competence – Accredited Person	27
3.8.2	Maintenance of competency	27
3.9	Safety Observer – General requirements	27
CHAPTER 4 – OPERATING CRANES AND MOBILE PLANT NEAR OVERHEAD POWER LINES		29
4.1	Scope	29
4.2	Hazard identification	29
4.3	Risk assessment	30
4.4	Control measures for cranes and mobile plant operating near overhead power lines	31
4.4.1	Elimination	31
4.4.2	Separation	31
4.4.3	Administrative controls	32
4.5	Workers in contact with the crane, load or mobile plant	33
4.5.1	Operators	33
4.5.2	Other workers	34
4.6	Competency requirements	34
4.7	Safety observer for crane and mobile plant operations	34
4.8	Earthing systems for cranes and mobile plant	35
4.9	Notices to be fixed to cranes and mobile plant	35
CHAPTER 5 – TREE AND VEGETATION MANAGEMENT NEAR OVERHEAD POWER LINES		36
5.1	Scope	36
5.2	Hazard identification and risk assessment	36
5.3	Eliminating or controlling risks – General risk factors	36
5.4	Requirements for Ordinary Persons carrying out tree and vegetation management	37
5.5	Requirements for Accredited Persons carrying out tree and vegetation management	38
5.6	Tree management inside the No Go Zone – Approval of the network operator	38
5.7	Trees or branches contacting live overhead power lines	39
CHAPTER 6 – WORK INVOLVING SCAFFOLDING NEAR OVERHEAD POWER LINES		40
6.1	Scope	40
6.2	Hazard identification	40
6.3	Risk assessment	40
6.4	Eliminating or controlling risks – general risk factors	41

6.5	Control measures for the erection and dismantling of scaffolding near overhead power lines	41
6.6	Erected Scaffolding – Use of a hoarding for reduced safety clearances	43
CHAPTER 7 – AGRICULTURAL WORK NEAR OVERHEAD POWER LINES		45
7.1	Scope	45
7.2	Hazard identification	45
7.3	Risk assessment	46
7.4	Control measures for agricultural work near overhead power lines	46
CHAPTER 8 – WORK NEAR LOW VOLTAGE OVERHEAD SERVICE LINES		48
8.1	Scope	48
8.2	Approach distance for work near low voltage overhead service lines	48
8.3	Work inside the relevant approach distance	49
8.4	Hazard identification	49
8.5	Risk assessment	50
8.6	Control measures for work near low voltage overhead service lines	50
CHAPTER 9 – ADDITIONAL CONSIDERATIONS FOR WORK NEAR OVERHEAD POWER LINES		52
9.1	Tiger tails	52
9.2	Notification of incidents	52
APPENDIX 1 – Warning notice for overhead electrical hazards		54
APPENDIX 2 – Example of a risk assessment checklist		55
APPENDIX 3 – Example Safe Work Method Statement		57
APPENDIX 4 – Model Training Course Guidelines – Safe Electrical Approach Training		60
APPENDIX 5 – Emergency procedure following contact with overhead power lines		62
APPENDIX 6 – Case Studies of Overhead Power Line Incidents		64
APPENDIX 7 – Useful publications		66

WHAT IS AN INDUSTRY CODE OF PRACTICE?

An approved industry code of practice is a practical guide to employers and others who have duties under the *Occupational Health and Safety Act 2000* (OHS Act) and the *Occupational Health and Safety Regulation 2001* (OHS Regulation) with respect to occupational health, safety and welfare.

An industry code of practice is approved by the Minister administering the OHS Act. It comes into force on the day specified in the code or, if no day is specified, on the day it is published in the NSW Government Gazette. An approved industry code of practice may be amended from time to time (or it may be revoked) by publication in the Gazette.

An approved industry code of practice should be observed unless an alternative course of action that achieves the same or a better level of health, safety and welfare at work is being followed.

An approved industry code of practice is intended to be used in conjunction with the requirements of the OHS Act and the OHS Regulation but does not have the same legal force. An approved industry code of practice is advisory rather than mandatory. However, in legal proceedings under the OHS Act or OHS Regulation, failure to observe a relevant approved industry code of practice is admissible in evidence to establish an offence under the OHS Act or OHS Regulation.

A WorkCover Authority inspector can draw attention to an approved industry code of practice in an improvement or prohibition notice as a way of indicating the measures that could be taken to remedy an alleged contravention or non-compliance with the OHS Act or OHS Regulation. Failure to comply with an improvement or prohibition notice without reasonable excuse is an offence.

In summary an approved **INDUSTRY CODE OF PRACTICE**:

- ✓ gives practical guidance on how health, safety and welfare at work can be achieved;
- ✓ should be observed unless an alternative course of action that achieves the same or a better level of health, safety and welfare in the workplace is being followed;
- ✓ can be used in support of the preventive enforcement provisions of the *Occupational Health and Safety Act*;
- ✓ can be used to support prosecutions for failing to comply with or contravening the OHS Act or OHS Regulation.

PREFACE

The aim of this code of practice is to protect the health and safety of persons from the risks arising when they are working near overhead power lines and associated electrical apparatus. It provides practical advice on implementing the requirements of the *Occupational Health and Safety Act 2000* and the *Occupational Health and Safety Regulation 2001*.

This code of practice provides practical guidance on the risk control measures, competency requirements and approach distances for workers working near overhead power lines. It applies to people with varying levels of qualification, training or knowledge.

This code of practice will assist employers, self-employed persons, employees, contractors and other parties involved in managing electrical risks associated with work near overhead power lines.

Use this code of practice to assess the effectiveness of your present arrangements when working near overhead power lines, and to check that all risks have been identified, assessed and eliminated or controlled.

This code of practice has been developed in consultation with members of the NSW electricity supply industry, including relevant unions and employer bodies. It is based on the earlier Electricity Association of N.S.W publication, *Interim Guide for Operating Cranes & Plant in Proximity to Overhead Power Lines*, and the Australian Standard AS 2550.5 – 2002 *Cranes, hoists and winches – Safe use Part 5: Mobile and Vehicle Loading Cranes*, which was gazetted as an approved industry code of practice on 21 September 2001 in the *Code of Practice: Technical Guidance*. In the event of any inconsistencies between the Standard and this code, the code shall prevail.

WHAT IS WORK NEAR OVERHEAD POWER LINES?

There are legislative obligations on employers, self-employed persons and controllers of premises in regard to undertaking work in close proximity, or at an unsafe distance, to overhead power lines. The term 'near' is utilised as a reference point for persons planning and undertaking this work.

Work 'near' overhead power lines means a situation where there is a reasonable possibility of a person, either directly or through any conducting medium, coming closer than the approach distances specified in this code. For the purposes of this code the term 'near' can be interchanged with other legislative or commonly used industry terms ie 'close proximity', 'unsafe distance' or 'in the vicinity of'.

PERSONNEL WORKING NEAR OVERHEAD POWER LINES

This code of practice is based on the assumption that without appropriate technical knowledge and experience of electricity distribution networks and associated electrical apparatus, untrained personnel working or operating cranes or plant near overhead power lines will not be able to identify the operating voltage concerned, and will therefore not be able to recognise and avoid the inherent dangers of live overhead power lines. These personnel are termed **ordinary persons**.

The approach distances specified in this code of practice take account of differing levels of technical knowledge, and are substantially greater for ordinary persons than for personnel who have been trained and assessed as having the necessary technical knowledge. These personnel are termed **accredited persons**.

HOW CAN WORKING NEAR LIVE OVERHEAD POWER LINES BE DANGEROUS?

Overhead power line contact is one of the largest single causes of fatalities associated with mobile plant and equipment.

Contact with live overhead power lines is a serious risk because any voltage that causes sufficient current to pass through the heart is potentially injurious or even fatal.

Contact with live electricity can also cause serious burns arising from the discharge of electrical energy. Other risks include fires and explosions that may immobilise the equipment involved.

You don't have to have a direct contact with a high voltage overhead power line to receive a fatal electric shock. ***Simply being too close can kill.***

WHAT DO THE SYMBOLS IN THE CODE OF PRACTICE MEAN?

To help you work out what you require, a number of symbols are used to highlight things you need to take into account and tools to help you do the job.



Consult and communicate with employers



Legal obligations that must be followed



The process of finding things that cause harm, working out how big a problem they are and fixing them.



Assess the risks in your workplace



Tools that can help you work out your plan

ACKNOWLEDGEMENT

In developing this code of practice WorkCover NSW has drawn on information contained in a number of codes of practice and industry guidelines issued by other State regulators or organisations. WorkCover NSW acknowledges the following publications, which have been incorporated in parts of this code.

- *Code of practice – Working near exposed live parts* – Queensland, Department of Industrial Relations, and
- *Framework for undertaking work near overhead and underground assets* – WorkSafe, Victoria, and
- *NENS 04-2003 National guidelines for safe approach distances to electrical apparatus* – Energy Networks Association.

CHAPTER 1 – ESTABLISHMENT

1.1 Title

This is the Code of Practice – Work near Overhead Power Lines.

1.2 Purpose

This code of practice provides practical guidance in order to protect the health and safety of persons working near overhead power lines and associated electrical apparatus. It provides guidance on the risk control measures, competency requirements and approach distances to live electrical conductors, including no go zones for cranes and plant (and their loads), as well as for vehicles, individuals and hand-held tools. It applies to persons with varying levels of qualification, training or knowledge.

This code of practice should be used instead of the *Interim Guide for Operating Cranes and Plant in Proximity to Overhead Power Lines – ISSC 26* issued by the Electricity Association of NSW in September 2001.

1.3 Scope

This code of practice applies to work, which is carried out near overhead power lines and associated electrical apparatus excluding:

- work on electricity network assets where the work is carried out in accordance with the requirements of the *Electricity Supply (Safety and Network Management) Regulation 2002* and the work is either:
 - by or for an electricity network operator, or
 - by an accredited service provider, or
 - by a telecommunications network operator.
- mobile plant or vehicles operating on a public road where the design envelope is not greater than the transit envelope and is in any case not greater than 4.6 metres in height (eg a side loading waste collection vehicle collecting waste bins from the side of a public road under overhead power lines);
- when the crane or item of plant is correctly stowed for travelling on a public road;
- work on a mine site;
- work involving low flying aircraft (eg crop dusting, pesticide or herbicide spraying, etc);
- work carried out by emergency services personnel, including state emergency service, fire, police, volunteer rescue association and ambulance personnel during a declared emergency or other local emergency incident. In this situation the agency should advise the network operator of the circumstances of the emergency work and ensure a safe system of work is applied by those emergency services personnel undertaking the work.

This Chapter 1 is introductory, describes the purpose of this code, and provides definitions. Chapter 2 explains the regulatory principles in the occupational health and safety legislation, which this code is intended to complement. Chapter 3 describes a framework for work near overhead power lines by outlining general risk management principles, competency requirements and approach distances for the work. More detailed risk management requirements for specific workplace activity are set out in Chapters 4 to 9 inclusive.

1.4 Authority

This is an industry code of practice approved by the Minister for Commerce, under section 43 of the *Occupational Health and Safety Act 2000*, on the recommendation of the WorkCover Authority of New South Wales ('WorkCover NSW').

1.5 Commencement

This code takes effect on [Gazettal /date]

1.6 Interpretation

1.6.1 Recommended practices

Words such as 'should' indicate recommended courses of action. 'May' or 'consider' indicate a possible course of action the duty holder should consider. However, you may choose an alternative method of achieving a safe system of work. For a further explanation, see 'What is an industry code of practice'.

1.6.2 Legal obligations

Words such as 'must', 'requires' and 'mandatory' indicate obligations, which must be complied with. Failure to comply with the code can be used as evidence in proceedings for an offence against the OHS Act or OHS Regulation (where the code is relevant to any matter, which it is necessary for the prosecution to prove to establish the commission of the offence).

1.7 Applicable legislation



Consult the OHS Act and the OHS Regulation for the specific legal requirements regarding occupational, health and safety responsibilities for work near overhead power lines.

Specific responsibilities:

Clause 41(4) of the OHS Regulation requires a controller of premises to ensure that persons working in, or undertaking maintenance on, the premises (apart from those undertaking electrical work) are prevented from coming within an unsafe distance from any overhead power lines or live electrical installations unless a risk assessment determines otherwise.

Clause 64(2)(e) of the OHS Regulation requires employers to ensure that persons at work, their plant, tools or other equipment and any materials used in or arising from the work do not come into close proximity with overhead electrical power lines (except if the work is done in accordance with a written risk assessment and safe system of work and the requirements of the relevant electricity supply authority).

Other significant legislation:

The *Electricity Supply (Safety and Network Management) Regulation 2002*, which is administered by the Department of Energy, Utilities and Sustainability, requires that a person must not carry out work on or near a network operator's transmission or distribution system and a network operator must not allow a person to carry out work on or near its transmission or distribution system unless the person is qualified under the relevant requirements of the network operator's network management plan, to carry out the work; and the work is carried out in accordance with the relevant requirements of that plan.

1.8 Definitions

The following definitions are used for the purposes of this code of practice:

access authority	means a written authorisation, issued by a network operator, which allows persons to work within the no-go zone.
accredited person	means a person who has successfully completed a recognised training course relating to work near overhead power lines that has been conducted by a registered training organisation.
accredited service provider	means a person who has been accredited by the Department of Energy, Utilities and Sustainability to undertake work on the electricity network.
approach distance	means the minimum separation in air from an exposed overhead conductor that must be maintained by a person, or any object held by or in contact with that person. Note: Refer to Chapter 3 for relevant approach distances.
approved	means approved in writing. This can be achieved by any, or a combination, of the following: • providing a paper document; • sending a facsimile; • other equivalent means (eg e-mail).
authorised person	means a person with technical knowledge or sufficient experience who has been approved by the network operator.
authorised representative	of an industrial organisation of employees means an officer of that organisation who is authorised under the <i>Industrial Relations Act 1996</i> .
competent person	for any task means a person who has acquired through training, qualification, experience, or a combination of them, the knowledge and skills to carry out the task.
conductor	means a wire, cable or form of metal designed for carrying electric current.
construction work	means any of the following: (a) excavation, including the excavation or filling of trenches, ditches, shafts, wells, tunnels and pier holes, and the use of caissons and cofferdams, (b) building, including the construction (including the manufacturing of prefabricated elements of a building at the place of work concerned), alteration, renovation, repair, maintenance and demolition of all types of buildings, (c) civil engineering, including the construction, structural alteration, repair, maintenance and demolition of, for example, airports, docks, harbours, inland waterways, dams, river and avalanche and sea defence works, roads and highways, railways, bridges and tunnels, viaducts, and works related to the provision of services such as communications, drainage, sewerage, water and energy supplies.
control measures	measures taken to minimise a risk to the lowest level reasonably practicable.

crane	means an appliance intended for raising or lowering a load and moving it horizontally, and includes the supporting structure of the crane and its foundations, but does not include industrial lift trucks, earth moving machinery, amusement devices, tractors, industrial robots, conveyors, building maintenance equipment, suspended scaffolds or lifts.
de-energised	means not connected to any source of electrical supply but not necessarily isolated.
earthed	means directly electrically connected to the general mass of earth so as to ensure and maintain the effective dissipation of electrical energy.
earth moving machinery	means an operator controlled item of plant used to excavate, load or transport, compact or spread earth, overburden, rubble, spoil, aggregate or similar material, but does not include a tractor or industrial lift truck.
electrical apparatus	means any electrical equipment, including overhead power lines and cables, the conductors of which are live or can be made live.
electricity network	means transmission and distribution systems consisting of electrical apparatus which are used to convey or control the conveyance of electricity between generators' points of connection and customers' points of connection. Note: Overhead power lines on private property come under the control of the controller of the premises.
elevating work platform	means a telescoping device, scissor device or articulating device, or any combination of those devices, used to move personnel, equipment or materials to and from work locations above the support surface.
envelope	means the space encapsulating a plant item, including attachments such as rotating / flashing lights or radio aerials and is categorised as: Design: the space encapsulating all possible movements of the plant and any load attached under maximum reach. Transit: the area encompassing the normal height and width of a vehicle or plant when traveling to or from a worksite.
employee	means an individual who works under a contract of employment or apprenticeship.
employer	means a person who employs persons under contracts of employment or apprenticeship. Note: In some chapters of the OHS Regulation, the term 'employer' includes a self-employed person in relation to duties to other persons. See the definition of 'employer' in clause 3 of the OHS Regulation.
energised	means connected to a source of electrical supply.
exposed conductor	an electrical conductor that is hazardous because it has not been protected by a barrier of rigid material or by insulation that is adequate for the voltage concerned, under a relevant Australian Standard specification.
hazard	means anything (including work practices and procedures) that has the potential to harm the health or safety of a person.

high-risk construction work	means any of the following construction work, • involving structural alterations that require temporary support • at a height above 3 metres • involving excavation to a depth greater than 1.5 metres • demolition work for which a licence is not required • in tunnels • involving the use of explosives • near traffic or mobile plant • in or around gas or electrical installations • over or adjacent to water where there is a risk of drowning.
high voltage (HV)	means a nominal voltage exceeding 1,000 V a.c. or exceeding 1,500 V d.c.
hoarding	for the purposes of this code is containment sheeting positioned on the external face of a scaffold that serves as a physical barrier between a worker and live overhead power lines and associated electrical apparatus.
insulated	means separated from adjoining conducting material by a non-conducting substance which provides resistance to the passage of current, or to disruptive discharges through or over the surface of the substance at the operating voltage, and to mitigate the danger of shock or injurious leakage of current.
Interim Guide	means the <i>Interim Guide for Operating Cranes and Plant in Proximity to Overhead Power Lines</i> – ISSC 26 issued by the Electricity Association of NSW.
isolated	means disconnected from all possible sources of electricity supply by means which will prevent unintentional energisation of the apparatus and which is assessed as a suitable step in the process of making safe for access purposes.
live	means connected to any source of electrical supply or subject to hazardous induced or capacitive voltages.
low voltage (LV)	means a nominal voltage exceeding 50 V a.c. or 120 V d.c. but not exceeding 1000 V a.c. or 1500 V d.c.
LV – ABC (Aerial Bundled Cable)	means an insulated cable system used for low voltage overhead distribution of electricity that is manufactured in accordance with the Australian Standard, AS/NZS 3560.
mobile crane	means a crane capable of travelling over a supporting surface without the need for fixed runways (including railway tracks) and relying only on gravity for stability, that is, with no vertical restraining connection between itself and the supporting surface and no horizontal restraining connection (other than frictional forces at supporting-surface level) that may act as an aid to stability.

mobile plant	includes plant that: (a) moves either under its own power, or is pulled or pushed by other mobile plant (b) moves on or around the work site, enters or leaves the site, or moves past the site (c) includes road vehicles operating at a worksite Note: This definition has been adopted for the purposes of this code of practice. This includes items such as earthmoving machinery, concrete boom pumps and tipper trucks operating at a worksite.
near	means a situation where there is a reasonable possibility of a person, either directly or through any conducting medium, coming closer than the relevant approach distances specified in this code.
network operator	means the owner, controller or operator of an electricity network also known as an electricity supply authority.
no go zone	means the area around overhead power lines into which no part of a person or material or cranes or vehicles or items of mobile plant may encroach without the approval of the network operator. Note: • person includes hand tools, equipment or any other material held by a person. • plant includes the load, controlling ropes and any other accessories.
occupier	of premises includes: (a) a person who, for the time being, has (or appears to have) the charge, management or control of the premises, or (b) a person who, for the time being, is in charge (or appears to be in charge) of any operation being conducted on the premises.
operating voltage	means the a.c. voltage (phase to phase RMS) or d.c. voltage by which a system of supply is designated.
ordinary person	means a person without sufficient training or experience to enable them to avoid the dangers which overhead power lines and associated electrical apparatus may create.
overhead power line	means any bare or covered aerial conductors and other associated electrical parts that make up an aerial line for the distribution and transmission of electrical energy.
personal protective equipment (PPE)	items that workers can use to protect themselves against hazards. PPE includes insulating gloves, mats or sheeting, glasses and face protection. Note: A number of items of PPE are made and tested to Australian Standards. PPE that is not designated as meeting a recognised Standard may be unreliable in service, as its performance is unknown.

place of work	means premises where persons work.
plant	includes any machinery, equipment or appliance. Note: For the purposes of this code the definition includes a broad range of machinery and equipment, but not limited to, cranes, mobile plant, scaffolding, load shifting equipment, industrial lift trucks, earth moving machinery, amusement devices, tractors, rural machinery, vehicles, conveyors, building maintenance equipment, suspended scaffolds or lifts, implements or tools and any component or fitting of those things.
premises	includes any place, and particularly includes: • any land, building or part of a building • any vehicle, vessel or aircraft, or • any installation on land, on the bed of any waters or floating on any waters, or • any tent or movable structure.
OHS Act	means the <i>Occupational Health and Safety Act 2000</i> .
OHS Regulation	means the <i>Occupational Health and Safety Regulation 2001</i> .
safety observer	means an accredited person specifically assigned the duty of observing and warning against unsafe approach to overhead power lines and associated electrical apparatus, or other unsafe conditions.
safe work method statement (SWMS)	means a statement that: • describes how the work is to be carried out • identifies the work activities assessed as having safety risks • identifies the safety risks; and • describes the control measures that will be applied to the work activities, and includes a description of the equipment used in the work, the standards or codes to be complied with, the qualifications of the personnel doing the work and the training required to do the work.
self-employed person	means a person who works for gain or reward otherwise than under a contract of employment or apprenticeship, whether or not they employ others.
tiger tails	means pipe type cable covers, used as a warning to visually indicate the position of overhead power lines. Note: A tiger tail is also known as a torapoli pipe.
vehicle	means a truck (non tipping), car or utility, or other general purpose conveyance used for the carriage of persons, materials or goods.
voltage	means a potential difference between conductors or between conductors and earth.
work	means work as an employee or as a self-employed person.

CHAPTER 2 – CONSULTATION AND RISK MANAGEMENT



The OHS Act and the OHS Regulation require employers to address workplace health and safety through a process of risk management and consultation.

To effectively implement this code, employers need to be aware of these requirements and have procedures in place to apply them. Employers are advised to consult the OHS Act and the OHS Regulation as well as the *Code of Practice: Occupational Health and Safety Consultation* and the *Code of Practice: Risk Assessment* for details of these requirements and how they can be met. The following information is designed to provide an overview of legislative requirements.

The OHS Regulation requires employers (and self-employed persons) to identify hazards and to ensure that any risk of injury from electricity at a place of work is eliminated, or if elimination is not reasonably practicable, the risk is controlled.

Other legislative requirements particularly relevant to this code are clause 64 of the OHS Regulation, which requires that employers must ensure that persons at work, their plant, tools or other equipment and any materials used in or arising from the work do not come into close proximity with overhead power lines.

Controllers of premises also have obligations under section 10 of the OHS Act and clause 41 of the OHS Regulation for work that is carried out near overhead power lines.

This code of practice provides guidance on ensuring these requirements are met and should be implemented within a risk management framework. Risk management is a way of organising your efforts to determine safe systems of work. Following this procedure will help you identify the safety issues for work that is to be carried out near overhead power lines.

The following information is designed to provide an overview of:

- consultation
- risk management
- information, instruction, training and supervision

2.1 Consultation at the workplace



Employers must consult with employees when taking steps to assess and control workplace risks.

In order to consult with employees, employers are required to set up consultation arrangements and develop consultation procedures.

2.1.1 Consultation arrangements

The OHS Act provides three options for consultation arrangements under sections 16 and 17:

Arrangement	Number of employees	Requirement
OHS committee	20 or more employees	• requested by a majority of employees, or • directed by WorkCover
OHS representative	any size	• at least one employee requests an election, or • directed by WorkCover
Other agreed arrangements	any size	agreed to by both the employer and employees (in a small workplace it may be a regular safety meeting with employees)

Before using this code, an employer should ensure that consultation arrangements are in place. An employer may initiate the establishment of an OHS Committee or the election of an OHS Representative if the employees have not made such a request. When the consultation arrangements have been decided, clause 27 of the OHS Regulation requires employers to record them and advise all existing and new employees.

2.1.2 Consultation procedures

After setting up the consultation arrangements, employers need to consider when and how these consultation arrangements need to be applied.

2.1.3 When should consultation be undertaken?

Under section 13 of the OHS Act, employers have a general duty to consult employees when decisions are being considered that may affect their health, safety and welfare at work. Therefore, employers are required to consult with their OHS Committee, OHS representative or other agreed arrangement when such decisions are being considered. Decisions, which could affect health, safety and welfare for work near overhead power lines include:

- eliminating or controlling risks to health and safety from work
- assessing, reviewing and monitoring risks to health and safety from work
- planning, designing or changing work tasks or jobs
- purchasing new plant and equipment or substances
- using contractors at the workplace
- investigating incidents or accidents
- developing emergency procedures
- determining or reviewing consultation arrangements

Note: Any procedures that are developed to encompass these activities should incorporate consultation.

It may not be practical or reasonable to involve the OHS committee or the OHS representative in every decision. However, the employers or committee or representatives should agree on what process is needed to ensure that affected employees are consulted.

2.1.4 How should consultation be undertaken?

When engaged in consultation, section 14 of the OHS Act requires employers to:

- Share all relevant information with employees – for example, if an employer is going to change a work task, employees need to be told of any risk to health and safety that may arise and what will be done to eliminate or control these risks.
- Give employees reasonable time to express their views – employees need adequate time to assess the information given to them, obtain relevant safety information and consult with fellow employees to enable them to form their views.
- Value the views of employees and take into account when the decision is made to resolve the matter – in many cases, agreement will be reached on how the safety issues are to be addressed. When agreement cannot be reached, the employer should explain how the employee's concerns have been addressed.

2.2 Risk management at the workplace



Employers and self-employed persons must identify any foreseeable hazards, assess their risks and take action to eliminate or control them. Employees must be consulted as part of this process.

A hazard identification and risk assessment process must be carried out at the planning and preparation stage by the employer/contractor, in consultation with the persons doing the work near overhead power lines to determine what risks may arise when the work is being carried out. Safe systems of work must then be put in place to eliminate or control these risks. **Note:** For some work activities carried out near overhead power lines the safe system of work must also be documented in a safe work method statement. Refer to section 2.4.1.

The process of risk assessment and control is made up of the following steps:

- identify the hazards
- assess the risk(s) to the health and safety of persons arising from the hazards
- use appropriate control measures to eliminate or control the risk(s)
- monitor and review the control measures to ensure on-going safety.

2.2.1 Identify hazards

To ensure a safe and healthy workplace, employers must take reasonable care to identify all the foreseeable health and safety hazards, which could harm their employees or other persons in the workplace. Hazards may arise from the work process, the equipment and materials in use, the work environment, or other people involved.

Live overhead power lines are a potential hazard posing substantial risk of death or serious injury. In addition to electrical shock and electrocution, contact with overhead power lines, can result in:

- the electrifying of other objects such materials, tools and items of plant, with the potential for electric shock or electrocution;
- a rain of molten metal caused by contact between an energised conductor and another conducting medium;
- fire;

- explosion; or
- swift, unpredictable power line whiplash.

2.2.2 Assess risks

Once hazards have been identified, the risk they pose to health and safety needs to be assessed. Some hazards pose a greater risk than others do, and the frequency and duration of exposure can also affect the risk. Risk assessment involves considering the likelihood and severity of injury or illness being caused by exposure to the risk. Therefore the factors that need to be considered in a risk assessment should include the:

- harm that can be caused by exposure to the hazard
- number of people and the duration and frequency of exposure to the hazard
- capability, skill and experience of people exposed to the hazard.

The risk assessment process provides information on the factors, which contribute to the risk. This information will assist in determining what needs to be done to eliminate or control the hazard.

2.2.3 Eliminate or control the risk

The OHS Regulation prescribes the following hierarchy of controls that must be used to eliminate or control a risk to health and safety in the workplace. Refer to the following chapters of this code of practice to see how this must be applied to work near overhead power lines. In particular, consider the following:

Level 1: Eliminate the hazard by:

- discontinuing the work activity or arranging for the de-energising of the overhead power lines during the work or re-routing the overhead power lines away from the work activity.

Level 2: Minimise the risk by:

- substituting the system of work or plant (with something safer that does not come near the overhead power lines). This could mean using an alternate crane or mobile plant, which cannot encroach the approach distances specified in this code.
- separating the hazard. This could mean erecting a physical barrier to prevent a person or anything held by a person, or attached to the person, coming near the overhead power lines.
- introducing engineering means. This could mean substituting with a less hazardous process or modifying an item of plant or equipment to ensure it does not come near the overhead power lines.
- adopting administrative controls, by example, signage, warning barriers marking the worksite, safe work procedures such as maintaining a safe distance from overhead power lines and using a safety observer to warn people before they encroach the approach distances specified in this code.
- using personal protective equipment (PPE). (eg insulating gloves, safety helmets, eye protection).

The control measures at Level 1 give the best results and should be adopted where possible. The Level 2 measures apply in descending order of effectiveness and require more frequent reviews of the hazards and systems of work. In some situations a combination of control measures may be used such as engineering means and administrative controls.

2.2.4 Review risk assessment and control measures

Control measures should be reviewed on a regular basis. The frequency of their review should be determined by considering the significance of the risks associated with the hazard. However, a review should be undertaken in the following circumstances:

- new information is made available about the risks associated with the hazard
- an accident or incident occurs
- significant changes are proposed to the workplace or work system.

2.3 Information, instruction, training, and supervision



The OHS Act requires employers to provide such information, instruction, training and supervision as may be necessary to ensure the health, safety and welfare of their employees while at work.

Work near overhead power lines should not be performed unless those performing the work have received appropriate instruction and training. For example, the operator of any crane or mobile plant and the safety observer who carry out work within the accredited person zone specified in this code must have received training for work near overhead power lines conducted by a Registered Training Organisation. Refer to Appendix 4.

Employers must provide appropriate supervision and should recognise their supervisor's role in the management of the risks and the protection of employees. Close liaison between supervisors and employees is vital in ensuring the work is carried out in a safe manner.

Supervision of crane and plant operators working near overhead power lines should ensure that the control measures are fully implemented and followed at all times by employees. If you are supervising, it is your responsibility to ensure that the situation is safe for everyone.

The level and extent of supervision required will vary according to the safety aspects of each task and the skills of the worker. In determining the necessary level of supervision, an employer should consider:

- the complexity of the job environment in which the job is being done;
- the hazards at each work site;
- the worker's level of competence, experience and age.

The levels of supervision required for various tasks need to be described in policies and procedures.

2.4 Provision of information

Health and safety information may include:

- the results of any applicable written risk assessment;
- requirements of safe work method statements;
- a review of the written risk assessment and/or safe work method statements and standard operating procedures;
- any other relevant OHS information, such as type test information, documentation and signage.

Persons working near overhead power lines should always have, on request, access to written risk assessments and safe work method statements at the work site. Employers should brief employees and other workers as to the contents of written risk assessments and safe work method statements when work begins near overhead power lines, at regular intervals thereafter, and whenever there are changes to written risk assessments or new information about health and safety risks becomes available.

The employer should consult with their employees to ensure that such information and training is in a form that is accessible and easily understood. This is important where employees are from a non-English speaking background and/or have special needs or disabilities, and may have specific language or literacy requirements.

2.4.1 Safe work method statements

Chapter 8 of the OHS Regulation requires that safe work method statements (SWMS) be used for high risk construction work.

High-risk construction work may include, for example the following activities that may occur near overhead power lines:

- construction work involving structural alterations that require temporary support;
- construction work at a height above 3 metres;
- construction work involving excavation to a depth greater than 1.5 metres;
- demolition work for which a licence is not required;
- construction work involving the use of explosives;
- construction work near traffic or mobile plant;
- construction work in or around gas or electrical installations.

An example of a safe work method statement is included at Appendix 3 to assist in this.

2.5 Preparation for work to commence

Careful planning and preparation is an essential step to ensure that work is done safely. When preparing for the commencement of work all controls indicated by the risk assessment(s) and safe work method statement(s) as applicable must have been put in place and that no new hazards exist, or have been created.

Preparation should include:

- nature of the work planned and ways of dealing with changes as the work proceeds;
- the possible hazards and risks associated with the work;
- consultation with the network operator;
- communication and interaction between workers at the site;
- training, qualifications and competency of workers;
- checking the operation of plant and equipment, including the operation of limiting devices;
- proximity of persons, cranes, mobile plant, material and tools to overhead powerlines;
- proximity of persons to cranes and mobile plant;
- specific instructions for employees;
- workplace access and egress;
- emergency procedures, including first aid, evacuation and rescue; and
- environmental factors.

CHAPTER 3 – APPROACH DISTANCES WHEN WORKING NEAR OVERHEAD POWER LINES

3.1 Scope

This Chapter introduces a framework for work near overhead power lines. It provides guidance on general risk management principles, competency requirements and approach distances to live electrical conductors, including no go zones for cranes and plant (and their loads), as well as for vehicles, individuals and hand-held tools. It applies to persons with varying levels of qualification, training or knowledge.

This Chapter should be read in conjunction with the following Chapters, which provide risk management requirements for various types of workplace activity, including scaffolding (Chapter 6) and work near low voltage overhead service lines (Chapter 8), which specify a different set of approach distances to those described in this Chapter.

3.2 Basis of approach distances

This code is based on the assumption that without appropriate technical knowledge and experience of electricity distribution networks, workers that have not received training in overhead power line electrical hazards (ordinary persons) will not be able to identify the operating voltage of the live overhead power lines. When working near or operating cranes or plant near live overhead power lines such persons will not be able to recognise and avoid the inherent electrical hazards.

The approach distances specified in this Chapter take account of differing levels of technical knowledge and items of plant, and are substantially greater for ordinary persons than for personnel who are accredited. The approach distances for ordinary persons and accredited persons are based on those specified in the *National Guidelines for Safe Approach Distances to Electrical Apparatus*. In the National Guidelines, the approach distances were derived by –

- determining a distance to avoid electrical flashover; and
- providing additional allowance for inadvertent movements of the person, crane or plant relative to the overhead power lines, or the movement of the overhead power lines relative to the person, crane or plant.

3.2.1 Assessing the relevant approach distance

Prior to the start of any work near overhead power lines it is essential that the height and voltage of the overhead power lines (and if applicable the horizontal safety clearance) be assessed at the worksite. When assessing the relevant approach distances for the work a number of factors must be taken into account including,

- the possibility of errors in estimating distances, especially at higher voltages, where the approach distance is large. It may be necessary either to allow more clearance or to use methods that provide more accurate estimation of distances, for example, an ultrasonic cable height indicator, which provides a safe and accurate method of estimating distances near overhead power lines. If the height or voltage of the overhead power lines cannot be accurately determined consult the network operator.



WARNING

Do not attempt to directly measure the height of overhead power lines. Do not use conductive metallic objects or measuring devices such as metal tape measures for estimating the height of overhead power lines.

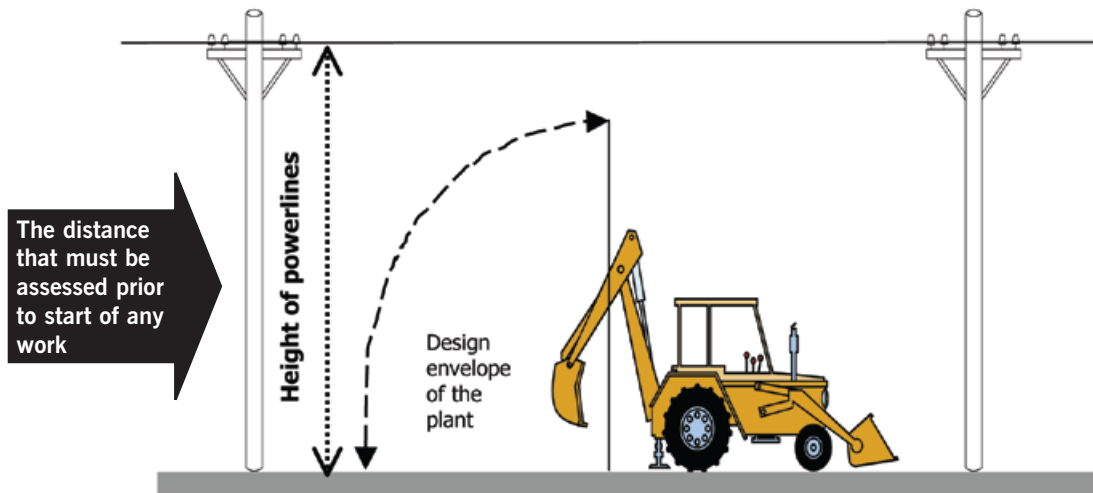


Figure 1: Distance that must be assessed for each worksite

- overhead power lines are made of metal and are therefore subject to expansion and contraction when heated and cooled. This can be a direct result of high ambient air temperature and/or excessive electrical load current passing through the conductors. Regardless of the cause, any expansion will result in gravity causing the power lines to sag downwards. Wind can also cause the power lines to swing from side to side. For this reason the approach distances must be increased either vertically or horizontally by the amount of conductor sag or swing at the point of work. Refer to Figure 2.

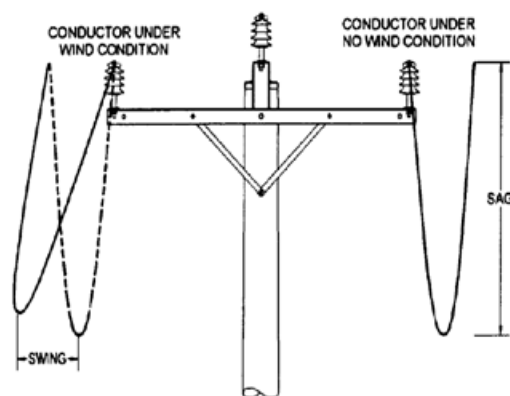


Figure 2: Illustration of overhead power line 'sag or swing'

- where more than one voltage is present, eg overhead power lines where two or more circuits operating at different voltages are supported on the same poles, the approach distance appropriate to each voltage must be maintained independently.
- increased clearances must be allowed where a risk assessment identifies a reasonable possibility of the load or lifting gear (crane hook, chains, slings, etc) moving or swinging towards the overhead power lines or associated electrical apparatus when the crane or item of mobile plant is operated.

3.2.2 Increases to approach distances

It is recognised that certain Australian Standards and industry practice in some States require greater approach distances than those described in this code. For certain types of work or classes of authorisation and competency, greater distances than that described in this code may be appropriate.

For example, the approach distances shown in Table 1 are less than those described in the Australian Standard AS 2550.5 Cranes, hoists and winches – Safe use Part 5: Mobile and Vehicle Loading Cranes, which is also gazetted as an approved industry code of practice. In the event of any inconsistencies between the Australian Standard and this code the approach distances specified in this code shall prevail.

Employers, self-employed persons and controllers of premises should determine the applicability of the approach distances described in this code for particular work circumstances and, if considered appropriate, specify greater approach distances for the work.

3.2.3 How close can I go to overhead power lines?

Once an assessment has been carried out of the worksite and the overhead power lines, a decision can be made on the approach distance for the proposed work. The approach distances and work zones described in this Chapter and illustrated in Figure 3 vary with the voltage of the overhead power lines and the level of accreditation of the person/s performing the work. The relevant approach distances are set out in the following tables:

- Table 1 provides the approach distances for ordinary persons. These are workers who have not received training in overhead power line electrical hazards and are restricted to work in the ordinary person zone. Refer to Section 3.3 and Figure 3.
- Table 2 provides reduced approach distances for accredited persons. These are workers who have successfully completed a recognised training course in overhead power line electrical hazards and are therefore permitted to work closer to the overhead power lines in the accredited person zone. Refer to Section 3.4 and Figure 3.
- Table 3 provides the approach distances for vehicles that are driven under overhead power lines. Refer to Section 3.6.

The approach distances vary with the voltage. They apply to:

- any part of a crane or item of mobile plant, including vehicles,
- any load being moved, including the slings, chains and other lifting gear,
- any person working at heights eg from an elevating work platform, scaffold, or other structure, or
- any hand tools, hand control lines, equipment or other material held by a person.

Note: Special approach distances apply for scaffolding work (Chapter 6) and work near low voltage overhead service lines (Chapter 8).

3.3 Ordinary Person Zone

Table 1 provides approach distances for:

- ordinary persons performing work near overhead power lines, (including plant, hand tools, equipment or any other material held by a person); or
- cranes (and their loads) and items of mobile plant operated by an ordinary person near overhead power lines.

Note: Where a written risk assessment determines it necessary, the use of a safety observer should also be considered for work performed by ordinary persons working outside but up to the approach distances specified in Table 1. The duties of the safety observer are described in Section 3.8.

TABLE 1

Approach distances for work performed by Ordinary Persons

Nominal phase to phase a.c. voltage (volts)	Approach distance (m)
Up to and including 132,000	3.0
Above 132,000 up to and including 330,000	6.0
Above 330,000	8.0
Nominal pole to earth d.c. voltage (volts)	Approach distance (m)
Up to and including +/- 1500 Volts	3.0

Note: Special approach distances apply for scaffolding work (Chapter 6) and work near low voltage overhead service lines (Chapter 8).

3.4 Accredited Person Zone

Table 2 provides approach distances for:

- accredited persons, with a safety observer who are performing work near overhead power lines (including plant, hand tools, equipment or any other material held by a person); or
- cranes (and their loads) and items of mobile plant operated by an accredited person with a safety observer near overhead power lines.

The approach distances in Table 2 are based on

- completion of a written risk assessment prior to the commencement of work,
- application of a safe system of work, which includes the use of a safety observer, and
- if determined by the written risk assessment, consultation with the network operator regarding the proposed work and compliance with any conditions imposed by the network operator for the work.

TABLE 2

Approach Distances for work performed by Accredited Persons, with a Safety Observer

Nominal phase to phase a.c. voltage (volts)	Approach distance (m)
Insulated low voltage cables up to 1000, including LV ABC	0.5
Un-insulated low voltage conductors up to 1000	1.0
Above 1000 up to and including 33,000	1.2
Above 33,000 up to and including 66,000	1.4
Above 66,000 up to and including 132,000	1.8
Above 132,000 up to and including 220,000	2.4
330,000	3.7
500,000	4.6
Nominal pole to earth d.c. voltage (volts)	Approach distance (m)
Up to +/- 1,500	1.0

Note: Special approach distances apply for scaffolding work (Chapter 6) and work near low voltage overhead service lines (Chapter 8).

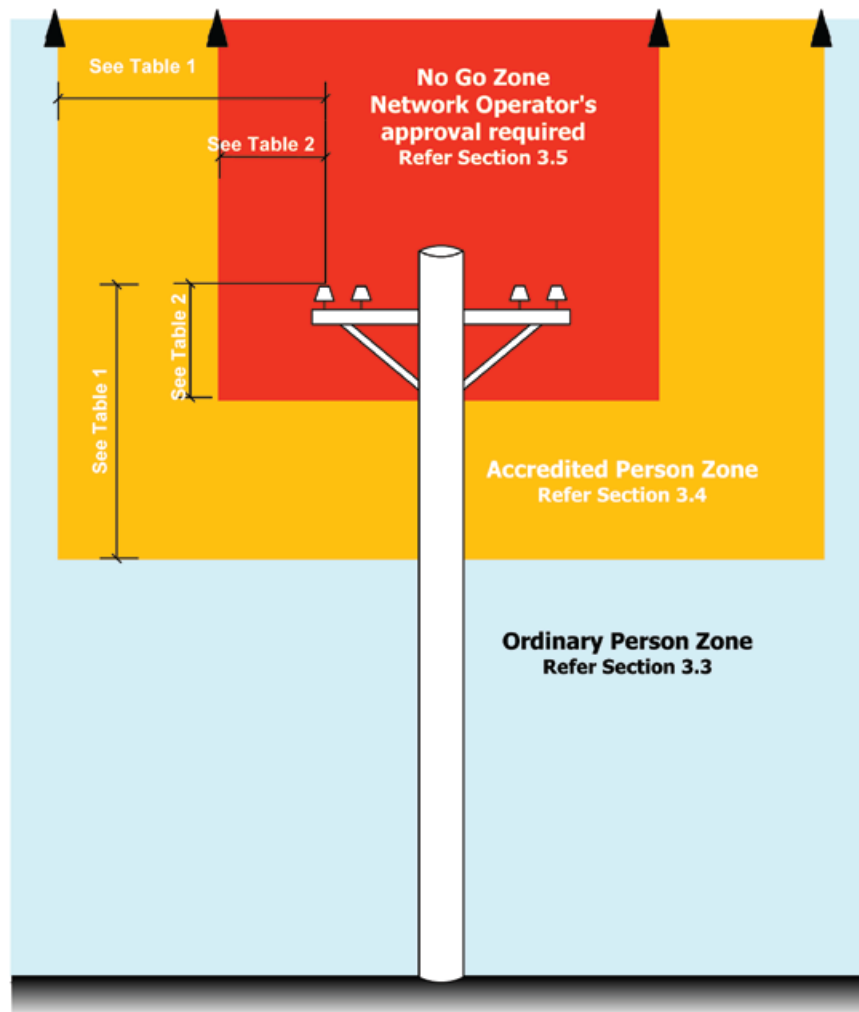


Figure 3 – Approach distances and work zones near overhead power lines

3.5 Work inside the No Go Zone – Approval of the network operator

The no go zone is the area around overhead power lines into which no part of a person or material or cranes or vehicles or items of mobile plant may encroach without the approval of the network operator.

Note:

- person includes hand tools, equipment or any other material held by a person.
- plant includes the load, controlling ropes and any other accessories associated with the plant.

If the work cannot be carried out without coming inside the no-go zone (closer than the approach distances listed in Table 2 or above the overhead power lines), prior to commencing work the employer must consult with and obtain the written approval of the network operator.

Note: The written approval should be available at the worksite and be able to be produced to a WorkCover Inspector, Principal Contractor, elected OHS representative, authorised representative or network operator.

3.6 Approach Distances for Vehicles

Table 3 provides approach distances for vehicles, mobile plant stowed for transit or with a design envelope up to an including 4.6 metres in height, which are driven by or operated by persons under overhead power lines.

When assessing the approach distance for a vehicle driven under overhead power lines a number of factors should be taken into account including:

- the approach distances specified in Table 3 are based on the fact that the design or transit envelope of the vehicle does not allow any part of the vehicle to come closer than the approach distances specified. This includes the load, exhaust pipe and attachments such as rotating/flashing lights or radio aerials. Refer to Figure 5 below.

Figure 5: Transit envelope – The maximum overall height of the vehicle



- where a work activity involves a person working from, standing on or walking across the top of a vehicle the relevant approach distance specified in either Table 1 or Table 2 must be maintained. This may include for example the driver of a livestock transporter who may need to access the top of the vehicle to check livestock.
- where, as a result of the work being performed the distance between the conductors and the ground may decrease (for example when constructing a road or levee bank beneath overhead power lines or where the ground level is raised during the work), then the distance between the vehicle must be continually re-assessed to ensure that the relevant approach distances are being maintained.
- any additional assessment factors that may be relevant for the operation of the vehicle as described in section 3.2.1.

TABLE 3**Approach Distances for Vehicles**

Nominal phase to phase a.c. voltage (volts)	Approach distance (m)
Low voltage conductors up to 1000	0.6
Above LV, up to and including 33,000	0.9
Above 33,000 up to and including 132,000	2.1
Above 132,000 up to and including 220,000	2.9
330,000	3.4
500,000	4.4
Nominal pole to earth d.c. voltage (volts)	Approach distance (m)
Up to and including +/- 1500 Volts	0.9

3.7 Work near overhead power lines – General risk management principles

The approach distances set out in this Chapter are only part of an overall safe system of work, which must be implemented by employers and self-employed persons working near overhead power lines and associated electrical apparatus. In implementing a safe system of work consideration should be given to the following risk control measures:

- The employer has in place an effective risk management process, as part of a systematic occupational health and safety management system.
- Appropriate workplace hazard identification and written risk assessments are carried out as required by the OHS Regulation in consultation with the workers performing the work.
- Consultation with the network operator regarding the proposed work and compliance with any conditions imposed by the network operator for the work.
- The approach distances used are appropriate for the levels of accreditation of the workers performing the work. Refer to Sections 3.3 and 3.4
- Operators and other workers are provided with information and instruction about the safety precautions needed and the requirements of this code, as well as appropriate training, supervision and safe work practices and procedures.
- An essential requirement of a safe system of work is that workers are competent to carry out the work concerned. This code specifies the competency requirements (in respect of overhead power line electrical safety awareness) for crane and mobile plant operators and safety observers. Refer to Sections 3.8 and 3.9.
- An effective communication system is in place for the personnel performing the work.
- An effective process is in place to monitor compliance with the adopted risk control measures, safe work practices and procedures for work carried out near overhead power lines and associated electrical apparatus.

3.8 Competence and knowledge of this code

In order to carry out work at distances less than the approach distances specified in Table 1 the following workers must be accredited in accordance with Section 3.9 of this code,

- the operator of a crane,
- the operator of mobile plant (including an elevating work platform),
- a safety observer.

3.8.1 Training and Competence – Accredited Person

Accredited persons such as operators of cranes, mobile plant and elevating work platforms who carry out work closer than the approach distances specified in Table 1 and safety observers who observe the work must have successfully completed an appropriate training course (eg Crane and Plant Electrical Safety Course) relating to work near overhead power lines that has been conducted by a registered training organisation. Refer to Appendix 4 of this code for a training course framework, which is recognised by WorkCover NSW and network operators.

Note: 'Successful completion' includes a satisfactory competency assessment.

The registered training organisation, which provides the training and competency assessment required by this code must provide the person concerned with a statement of attainment or written certification of his/her successful completion of assessment, that has an identifying number particular to that person.

Employers should maintain appropriate training and assessment records for 'accredited persons' and other employees who carry out work near overhead power lines.

3.8.2 Maintenance of competency

The employer of accredited persons must ensure that those persons are either re-assessed or re-trained annually to ensure their on-going competency to perform activities associated with work near overhead power lines.

Re-assessment or re-training must cover as a minimum the knowledge and skills necessary to ensure safe work practices near overhead power lines, approved resuscitation procedures and emergency procedures to be followed in the event of an accident.

Following re-assessment, persons who have failed to maintain competency through the regular on the job application of learnt skills and knowledge must undertake refresher training and competency assessment.

3.9 Safety Observer – General requirements

The safety observer is a person specifically assigned the duty of observing the work near live overhead power lines and associated electrical apparatus in order to –

- warn personnel or the crane or plant operator so as to ensure the approach distances are being maintained, and
- warn of any other unsafe conditions.

The safety observer must –

- be used whenever the work activity is likely to be performed in the Accredited Person Zone.

Note: Where a written risk assessment determines it necessary, the use of a safety observer should also be considered for work outside but up to the Accredited Person Zone.

- be positioned at a suitable location to effectively observe both the overhead power lines and plant;
- be able to immediately and effectively communicate with the operator of the crane or mobile plant, or other personnel if required;
- ensure that all personnel stay outside the specified approach distance (unless performing a rescue in accordance with approved procedures or carrying out a specific task that is described in the safe work method statement eg a crane dogman holding a non-conductive tag line attached to a load suspended from a mobile crane);
- not carry out any other work while acting as a safety observer, which includes the passing of tools, equipment or materials directly to the personnel performing the work;
- not observe more than one work activity at a time; and
- continue to monitor the work activity being carried out and have the authority to suspend the work at any time.

CHAPTER 4 – OPERATING CRANES AND MOBILE PLANT NEAR OVERHEAD POWER LINES

4.1 Scope

In addition to the general requirements described in Chapter 3, this chapter details any variations applicable where a person operates a crane or an item of mobile plant near overhead power lines, including, but not limited to the following items of mobile plant:

- cranes (including mobile cranes and vehicle loading cranes);
- concrete placing booms;
- elevating work platforms (EWPs);
- mobile plant (including truck operators engaged in tipping loads, restraining loads or other associated work);
- load shifting equipment (including forklifts).
- excavation and earthmoving equipment
- high load transportation vehicles

However, the application of this Chapter is not limited to any particular type or class of mobile plant or equipment.

Note: This chapter is not intended to cover cranes and mobile plant when they are retracted and correctly stowed when travelling on a public road or where the design envelope of the crane or item of mobile plant is less than 4.6 metres in height.



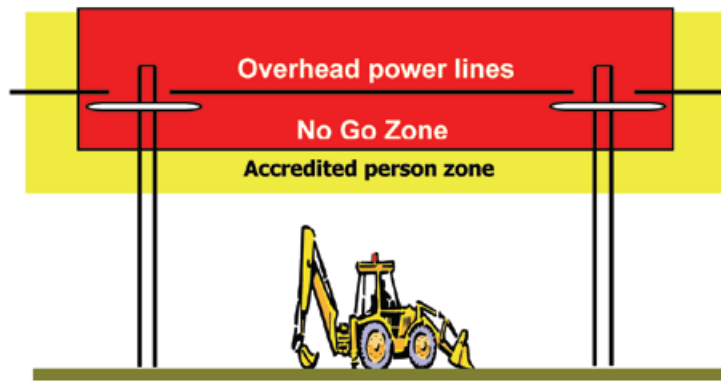
WARNING

For the operation of cranes, mobile plant and other types of load shifting equipment the approach distances specified in this code of practice are greater than those described in the National Certificate of Competency – Assessment Instruments. Where any discrepancy exists between the National Assessment Instruments and this code, the code shall prevail.

4.2 Hazard identification

Before operating a crane or item of mobile plant, the operator or other person in control of the work must take reasonable care to inspect the workplace to identify potential hazards, including any live overhead power lines or other associated electrical apparatus in the vicinity of the workplace.

All overhead power lines should be treated as live unless the operator of the crane or mobile plant has received an access authority or other form of written documentation from the network operator.



Mobile plant including cranes, excavators, EWPs, earth moving machinery, tipper trucks and concrete placing booms whose design envelope is within the approach distances specified in Table 1 must be controlled by safe systems of work as described in this chapter.

Figure 6: Cranes and mobile plant working near overhead power lines

4.3 Risk assessment



Risk assessment involves looking at the:

- likelihood (which is a combination of length of time and frequency of exposure); and the
- likely severity, of any injury or illness that may occur.

If you have identified a hazard involving overhead power lines where it is foreseeable that the work activity, crane or item of mobile plant will be required to or might inadvertently encroach on the approach distances specified for ordinary persons set out in Table 1, a written risk assessment must be completed which considers the following factors:

- consulting the network operator regarding the proposed work;
- can the electricity supply be de-energised?
- the location and voltage of the overhead power lines;
- the number of people involved and their individual needs;
- the nature of work undertaken;
- the nature, size and shape of the load to be moved, eg dimensions, surface area and whether the load is conductive;
- the setting up and packing up processes;
- the safe work practices and procedures in use;
- the type of crane, mobile plant, machinery and equipment to be used and its design envelope;
- site conditions, stability of crane or mobile plant and suspended loads;
- the potential for inadvertent movement of the crane or mobile plant, the load, persons and electrical equipment in the area;
- the qualifications, competency, skill and experience of people doing the work;
- vehicular traffic, pedestrians, or livestock that could interfere with the work;
- prevailing or unexpected wind strength and direction and weather conditions;
- foreseeable abnormal conditions that may exist at the worksite.

Having assessed the risks, action must now be taken to ensure that the risks are eliminated or controlled. Employers need to ensure adequate supervision of workers to make sure that control measures are applied.

Listed below in section 4.4 are steps to consider. Every workplace is different, so select the controls that are the right ones for you.

4.4 Control measures for cranes and mobile plant operating near overhead power lines

The highest practical level of control should be used. This does not preclude the additional use of appropriate lower level controls. In determining the control measures appropriate for a particular task consideration must be given to the terrain and ground conditions, weather conditions, lighting, and other work in the vicinity as well as the nature of the actual task to be carried out.

4.4.1 Elimination

Eliminate the risk of electrocution, electric shock or burns by arranging for the network operator to isolate the electricity supply for the duration of the work. Consideration may also be given, following consultation and agreement of the network operator, to re-route the overhead power lines away from the crane or mobile plant or replace existing overhead powerlines with underground cables.

	WARNING Even if it is believed that the supply has been isolated, it must be assumed that all conductors and components are live until an access authority or other form of written documentation has been received from the network operator.
---	---

The employer, self-employed person or operator of the crane or mobile plant should:

- (a) discuss options for de-energising or re-routing the electricity supply with the network operator or in the case of work involving private overhead power lines, the person in control of the premises;
- (b) consider working at another time when the electricity supply can be isolated; and
- (c) investigate whether the section of the overhead power lines that needs to be de-energised can be isolated, while leaving the remainder connected.

4.4.2 Separation

If the risk cannot be eliminated, then separate the hazard from the crane or mobile plant and the personnel by:

- (a) using an alternative crane or mobile plant which cannot encroach on the approach distances;
- (b) limiting the hoisting, slewing or other movements of the crane or mobile plant such as:
 - mechanical stops or interlocking of the motion of the crane or mobile plant to prevent it from being moved by power within the approach distance;
 - mechanical constraints on the jib, boom, or other part of the crane or mobile plant likely to contact live overhead power lines or associated electrical apparatus as a result of surge or backlash;
 - using cranes or mobile plant fitted with programmable zone limiting devices.
- (c) setting up the crane or mobile plant in a position that keeps the design envelope outside the approach distance.

Note: Consideration should be given to any loads suspended by the crane or mobile plant or when being moved by load shifting equipment.

(d) minimising unexpected movement of the crane or mobile plant through:

- additional outriggers, supports or packing to increase the stability of the crane or mobile plant;
- preparation of the ground or surface, or adjustment or servicing of the crane or mobile plant, to minimise surge or backlash;

Increased clearances must also be allowed where there is a reasonable possibility the load or lifting gear (crane hook, chains, slings, etc) moving or swinging towards the overhead power lines or associated electrical apparatus when the crane or item of mobile plant is operated.

(e) providing marking barriers to define areas that the crane or mobile plant should not enter such as by:

- using rigid or tape barriers to mark off areas under overhead power lines;
- arranging for the network operator to mark the limit of the approach distance with high visibility 'bunting' or similar. Refer to Figure 7 below.



Figure 7: Illustration of a visual tape bunting fitted under overhead power lines.

(f) providing electrical separation between the people and hazard in accordance with the guidance outlined in Section 4.5 – Workers in contact with the crane, load or mobile plant.

4.4.3 Administrative controls

Support elimination and separation controls by taking the following precautions:

(a) managing and supervising the work to ensure that:

- the work is done very carefully and in an un-hurried, considered manner (haste can be dangerous);
- the employer's safe work method statements are rigorously followed;
- the appropriate persons involved in the work are accredited in accordance with the requirements of Section 3.8 of this code.

(b) making the hazard visible by arranging for the network operator to effectively identify exposed live low voltage conductors (up to and including 1000 volts) by using approved visual indicators such as sheeting or sleeves eg 'tiger tails'. In this situation the 'tiger tails' should extend a minimum distance of 5 metres beyond the extremities of where the crane or item of mobile plant will be operating. A competent person should visually inspect the tiger tails each day prior to commencing the crane, or mobile plant operations. If they have moved or been damaged the network operator should be contacted to ensure the tiger tails are replaced or located in the correct position. Refer to Section 9.1 of this code.

- (c) planning for emergencies including:
- having fire-fighting equipment that is suitable for electrical fires at the site and readily accessible;
 - having an appropriate first aid kit available at the worksite.
- (d) ensuring that a safety observer is used whenever a crane, mobile plant or load is in motion and is likely to come closer than the approach distances listed in Table 1 and illustrated in Figure 3. The duties of the safety observer for work involving cranes and mobile plant is described in Section 3.9 of this code.
- (e) considering the fitting of a warning device to the crane or mobile plant that alerts the operator when the crane or mobile plant has entered energised high voltage overhead power line zones. Warning: These devices are not a substitute for the proper management of safe work practices and procedures.
- (f) using warning signs to indicate the location of overhead power lines and/or defined work areas. Refer to Figure 8 below.



Figure 8: Overhead power lines warning sign

4.5 Workers in contact with the crane, load or mobile plant

No-one may remain in contact with any part of a crane, load or mobile plant and the ground or other earthed situation while the crane or mobile plant is being operated closer than the approach distances listed for ordinary persons in Table 1 of this code, unless additional precautions are taken to prevent electric shock, as follows.

4.5.1 Operators

The operator may handle the controls of a crane or item of mobile plant while standing on the ground or while in an earthed situation only if -

- the controls are effectively insulated (consultation with the network operator will be necessary to verify effective insulation); or
- are wireless remote control; or
- the operator wears low voltage insulating gloves – provided that the live electrical apparatus is low voltage; or
- for low voltage, the operator stands on a rubber insulating mat 900mm x 900mm x 6 mm thick that is clean and dry; or
- the operator stands on an 'equipotential conductive mat' which is electrically connected to all metalwork associated with the controls.

4.5.2 Other workers

Other workers at the workplace may contact the crane, mobile plant or load while standing on the ground or while in an earthed situation only if one of the following control measures is observed -

- they wear low voltage insulating gloves – provided that the overhead power lines or electrical apparatus is low voltage; **or**
- effective insulation is provided on the overhead powerlines or electrical apparatus, or the crane, load or mobile plant or it's parts to ensure that even if it contacts the overhead powerlines or electrical apparatus, no-one would receive an electric shock; **or**
- control of the load by non-conductive tail ropes whenever uncontrolled motion could allow it to come within the approach distance (as long as the insulating properties of the rope are appropriate to the operating voltage), **or**
- they are positioning or removing lifting gear from a crane hook or the load while it is stationary; **or**
- they are adjusting outriggers, jacks, packing's, chocks or similar, as long as the crane, load or mobile plant is not being moved.

4.6 Competency requirements

In order to carry out crane and mobile plant operations closer than the approach distances specified in Table 1, the following personnel must be accredited as described in section 3.8 of this code,

- the operator of a crane,
- the operator of mobile plant (including an elevating work platform),
- a safety observer.

4.7 Safety observer for crane and mobile plant operations

A safety observer as described in Section 3.9 must be assigned the duty of observing the approach of a crane or mobile plant (and its load) to the live overhead power lines and associated electrical apparatus.

The safety observer must –

- be used whenever the crane, load, mobile plant or persons working from the plant are in motion and are likely to come closer than the approach distances specified in Table 1;

Note: Where a written risk assessment determines it necessary, the use of a safety observer should also be considered for work performed by ordinary persons working outside the approach distances specified in Table 1.

- be positioned at a suitable location to effectively observe both the overhead power lines and plant;
- be able to immediately and effectively communicate with the operator of the crane or mobile plant, or other personnel if required;
- ensure that all personnel stay outside the specified approach distance (unless performing a rescue in accordance with approved procedures or carrying out a specific task that is described in the safe work method statement eg a crane dogman holding a non-conductive tag line attached to a load suspended from a mobile crane);
- not carry out any other work while acting as a safety observer, which includes the passing of tools, equipment or materials directly to the personnel performing the work;
- not observe more than one crane or item of mobile plant at a time; and

- continue to monitor the work activity being carried out and have the authority to suspend the work at any time,

In addition to the above requirements, the safety observer must not be located on the workbasket of an elevating work platform while observing the work being undertaken from that workbasket.

A safety observer is not necessary in the following circumstances –

- for an item of stationary plant, once completely erected, if it is not located below the overhead power lines or electrical apparatus and is located horizontally outside the approach distances specified in Table 2;
- if an effective limiting device has been set to prevent any component of a crane, mobile plant or load coming closer than the approach distances in Table 2, as long as the limiting device is effective under stress conditions and is regularly inspected and tested by a competent person; or
- where, the design of the crane or mobile plant limits movement so that no part of the crane, mobile plant or load can come closer than the approach distances specified in Table 2.

4.8 Earthing systems for cranes and mobile plant

The chassis of a crane or item of mobile plant may, where practical, be earthed and bonded. A system of work must be adopted that ensures workers are kept clear of cranes and mobile plant when work is carried out near live overhead power lines and workers be advised of the effectiveness of the earthing system.

For specific advice and guidance about the earthing of a crane or item of mobile plant consult with the network operator.

4.9 Notices to be fixed to cranes and mobile plant

Cranes or items of mobile plant intended for use, or used, near live overhead power lines must be fitted with a warning notice or label, conforming to Appendix 1 of this code, listing the approach distances for ordinary persons as set out in Table 1.

The notice or label must be maintained in a legible condition and be displayed at each set of controls and must be readily visible to the operator.

Note: Where a crane or item of mobile plant is fitted with notices in accordance with the Interim Guide, the existing notices may be retained provided the plant is operated to the distances shown on the notice. Only columns described in the Table A notice for ‘non-electrical work’ or Table B for ‘unqualified personnel’ must be applied in relation to work under this code.

CHAPTER 5 – TREE AND VEGETATION MANAGEMENT NEAR OVERHEAD POWER LINES

5.1 Scope

In addition to the general requirements described in Chapter 3, this chapter details any variations applicable where a person works on trees such as, cutting, trimming, treating with chemicals or other processes, trees and other foliage near live overhead power lines where:

- a person or something the person is holding or is in contact with or could come closer than the relevant approach distance specified in either Table 1 or Table 2 of this code or;
- the work creates risk of damage to overhead power lines or electrical apparatus.

Tree and vegetation management carried out by or for network operators is excluded from this section as it is covered by the requirements of the *Electricity Supply (Safety and Network Management) Regulation 2002*.

5.2 Hazard identification and risk assessment

When carrying out the work, live overhead power lines are a potential hazard posing substantial risk of death or serious injury.

During tree and vegetation management electrical hazards can be encountered through a variety of circumstances. These include but are not limited to:

- branches or other vegetation falling onto power lines during trimming operations
- tools such as power saws or power trimmers coming into direct contact with power lines or other associated electrical apparatus
- mobile plant, for example an elevating work platform (EWP), coming into contact with overhead power lines or other associated electrical apparatus
- power lines becoming broken and falling on the ground, footpath or road
- wind blowing branches or limbs against overhead power lines
- high winds resulting in the loss of control while lowering materials
- unexpected movement of the worker, mobile plant or the vegetation relative to the worker.

If a hazard involving tree management work near overhead power lines has been identified, a written risk assessment must be undertaken by the employer to determine the risk to persons encroaching within the relevant approach distances. This step will help determine the level of risk associated with the identified hazards and establish a priority list based on the level of risk.

5.3 Eliminating or controlling risks – General risk factors

The risks associated with electrical hazards arise from coming near live conductors. The best means of eliminating the risks is to prevent people, their plant and equipment, as well as any materials from coming close enough to live conductors for direct contact or flash over to occur.

Care needs to be taken in planning the work to identify the ways in which people may be exposed to electrical hazards when the work is undertaken and determine the most effective means to ensure the approach distances are maintained from the live overhead power lines.

In addition to ensuring that the work near overhead powerlines is avoided, other factors should be considered:

- always assume an overhead power line or associated electrical apparatus to be energised or 'live' unless an access authority or other written documentation is received from the network operator.
- if a telecommunication cable is encountered, never assume that the operating voltage is harmless.
- a tree or branch of a tree can conduct electricity even in dry conditions. Never assume that a tree branch can safely rest on or against overhead power lines. If the tree or branch has the potential during the felling or cutting process to come closer than the approach distances specified in Table 1 the overhead power lines should be de-energised.
- trees that have grown into contact with live overhead power lines must not be cut by a person who is in an earthed situation (such as a standing on the ground or working from within the tree) unless a safe system of work is used that meets the requirements of the network operator.
- plant that comes near an overhead power line may become energised and pose a serious danger to the operator and any bystanders. Ensure that when operating plant (ie any machines (including chain saws), tools or equipment) near live overhead powerlines that the relevant approach distances are maintained. Operations should cease where trees or persons are in danger of coming closer than the relevant approach distances.
- manage traffic and pedestrians at the worksite to ensure approach distances are maintained and that members of the public are kept at a safe distance. If the work near overhead power lines requires a change in traffic direction or vehicle speed limits, full traffic control is required in accordance with the Roads and Traffic Authority's requirements.
- assess the weather conditions, including electrical storms, significant rain or excessive wind velocities that could impact on the proposed work.

5.4 Requirements for Ordinary Persons carrying out tree and vegetation management

An ordinary person must not:

- climb a tree closer than 3 metres to live overhead power lines, or cut any branch that may come closer than 3 metres to live overhead power lines as a result of the work, or
- allow any part of their body or anything they are holding or that is attached to their body, or anything they are using, to come closer than the approach distances specified in Table 1 of this code when carrying out the work near live overhead power lines.

Ensure the work is not carried out above overhead power lines or where any part of the tree or vegetation could fall or otherwise be carried closer than the approach distances specified in Table 1.

If there is a reasonable possibility of the work being carried out above overhead power lines or coming closer than the approach distances specified in Table 1 the work must be carried out by accredited persons who have been trained and have current competency to carry out 'tree and vegetation management' near live overhead power lines. See Section 5.5 of this code.

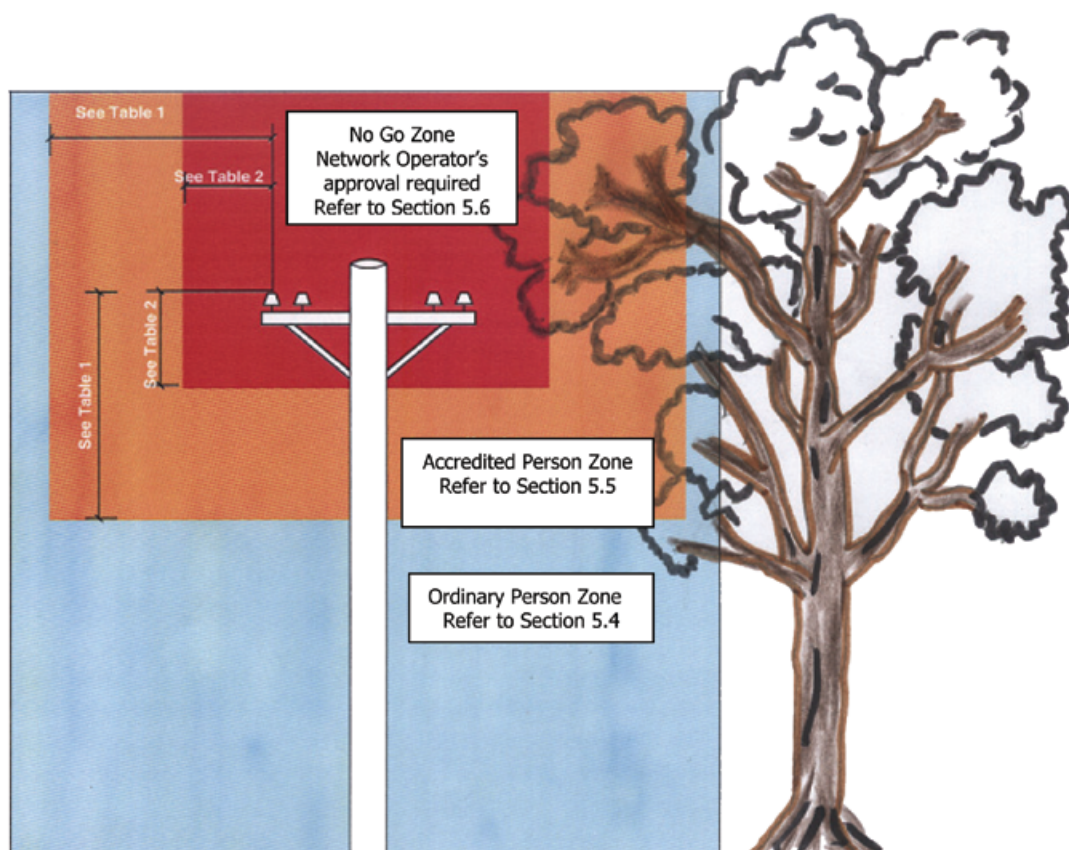


Figure 9 – Work zones for tree management near overhead power lines

5.5 Requirements for Accredited Persons carrying out tree and vegetation management

Accredited persons who have current competency to carry out 'tree and vegetation management' near live overhead power lines may carry out the work in accordance with the approach distances specified in Table 2 of this code provided the following requirements are observed,

- a written risk assessment is completed for the work and a safe system of work is implemented, which includes a safety observer, and
- if determined by the written risk assessment, consultation with the network operator regarding the proposed work and compliance with any conditions imposed by the network operator for the work.

Note: Training and assessment requirements for accredited persons, which include safety observers are described in Sections 3.8 and 3.9 of this code.

5.6 Tree management inside the No Go Zone – Approval of the network operator

The no go zone is the area around overhead power lines into which no part of a person or material or cranes or vehicles or items of mobile plant may encroach without the written approval of the network operator.

- person includes hand tools, equipment or any other material held by a person.
- plant includes the load, controlling ropes and any other accessories associated with the plant.

Work required on tree and vegetation that is inside the no-go zone (closer to live overhead power lines than the approach distances specified in Table 2 of this code) must only be performed by authorised persons approved by the network operator.

5.7 Trees or branches contacting live overhead power lines

While it is not permitted to work on trees where they (or their branches) may fall on overhead power lines, it is important to know what action to take if a branch or tree comes into contact with a live overhead power line, whether through pruning, wind, storm or other damage.

When this situation arises, *do not touch any part of the branch or tree*. If any part of a branch is touching live power lines, the entire branch may be 'live', including the leaves. Contact with any part of it may result in electric shock, burns or electrocution.

Immediately contact the network operator and keep all persons clear of the area while waiting for assistance.

Other aspects of tree and vegetation management safe work practices and procedures can be found in the *Code of Practice – Amenity Tree Industry*.

CHAPTER 6 – WORK INVOLVING SCAFFOLDING NEAR OVERHEAD POWER LINES

6.1 Scope

In addition to the general requirements described in Chapter 3, this chapter details any variations applicable where the work involves the erection, dismantling and use of fixed scaffolding near overhead power lines and associated electrical apparatus with an operating voltage up to and including 33 kV a.c. For scaffolding work above this voltage the network operator must be consulted and any special conditions imposed by the network operator complied with.

The guidance provided in this Chapter should be read in conjunction with AS/NZS 4576 – Guidelines for Scaffolding, which is an approved industry code of practice. In the Standard a 4 metre approach distance is provided for metallic scaffolding used near overhead power lines. This approach distance is used as a reference point for persons planning and undertaking scaffolding work as described in this Chapter.

For work involving the use of mobile aluminium scaffolding refer to the risk control measures for mobile plant that are described in Chapter 4 of this code.

6.2 Hazard identification

Before undertaking any scaffolding work where the work might come closer than the 4 metre approach distance specified in AS/NZS 4576 – Guidelines for Scaffolding, an inspection must be carried out at the worksite and reasonable care taken to identify any potential hazards.

Hazards may include:

- live overhead power lines and associated electrical apparatus;
- deteriorated or broken down insulation on the conductors or electrical apparatus;
- scaffolding coming into contact with overhead power lines; and
- possibility of hand held tools, equipment or materials coming into contact with overhead power lines.

6.3 Risk assessment

If a hazard involving overhead power lines has been identified, a written risk assessment must be undertaken by the employer to determine the risk to persons encroaching within the 4 metre approach distance. This step will help determine the level of risk associated with the identified hazards and establish a priority list based on the level of risk. If the scaffolding work is above 3 metres in height it must also be supported by a safe work method statement for the work. Refer to Appendices 2 and 3 of this code.

The following factors may be included in the risk assessment:

- the type of work activities being undertaken, tools, equipment, scaffolding and materials being used;
- proximity of the work activity or scaffolding to the overhead power lines;
- environmental conditions, such as rain, wind or uneven terrain, which may bring a risk of unexpected movement of tools, equipment, scaffolding or material held by workers.

6.4 Eliminating or controlling risks – general risk factors

Once the hazards associated with scaffolding work near the overhead power lines have been identified and assessed, then control measures must be implemented to eliminate the risk. If it is not practicable to do so, the risks associated with the hazard must then be controlled.

The use of specific control measures to eliminate or control identified risks should be done on the basis of the risk assessment. In particular, consider the following:

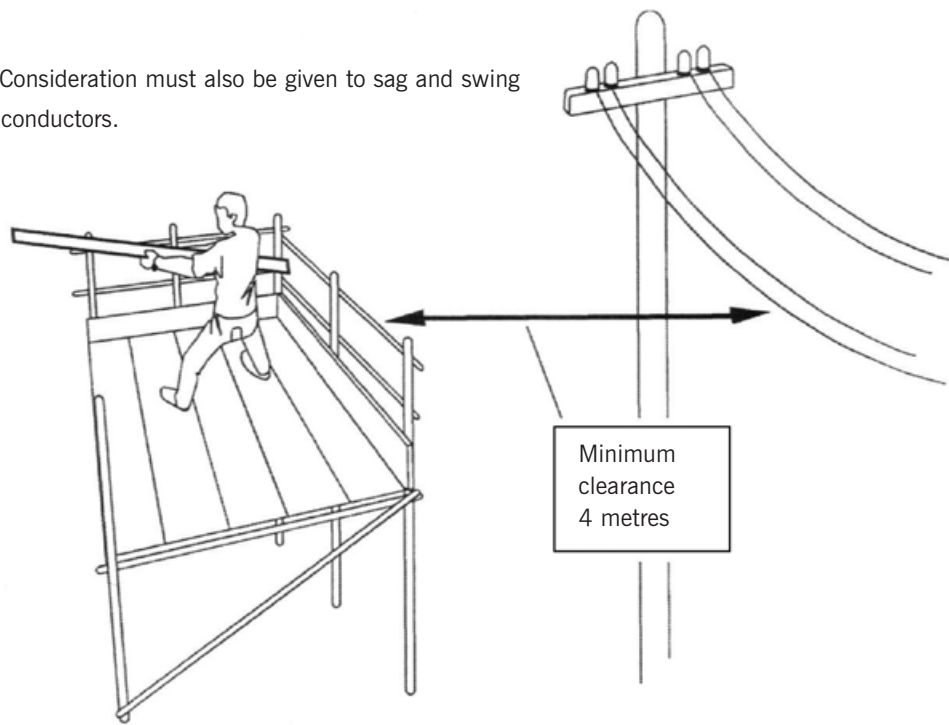
1. Eliminating the hazard. This could involve de-energising the overhead power lines during the work. Consideration may also be given, following consultation and agreement of the network operator, to re-route the overhead power lines away from the scaffolding or replace existing overhead powerlines with underground cables.
2. Separating the hazard. This could mean erecting a physical barrier on the scaffold to prevent a person or anything held by a person, or attached to the person, encroaching with the 4 metre approach distance.
3. Minimising the risk by engineering means. This could mean substituting the scaffold with another means of access and egress, such as an elevated work platform or using an insulated fibreglass extension handle on a paint roller, instead of a conductive aluminium extension handle.
4. Introduce administrative controls. This may include planning and where relevant documenting the safe work method statements before starting work or using a safety observer to warn people before they encroach within the 4 metre approach distance. The duties of a safety observer are outlined in Section 3.9 of this code. Making the hazard visible by arranging for the network operator to effectively identify exposed live low voltage conductors (up to and including 1000 volts a.c.) by using approved visual indicators eg 'tiger tails'. Refer Section 9.1 of this code.
5. Use appropriate personal protective equipment. This includes the use of electrically tested insulating gloves by anyone who may be at risk of coming closer than the 4 metre approach distance.

A combination of the above control measures is required to be taken to minimise the risk to the lowest level reasonably practicable if no single measure is sufficient for that purpose.

6.5 Control measures for the erection and dismantling of scaffolding near overhead power lines up to and including 33kV

- (a) Ensure a thorough examination and assessment is undertaken of the surroundings prior to the erection or dismantling of the scaffold near overhead powerlines. No scaffold work should commence until the presence, location, type and operating voltage of all overhead power lines are determined by a competent person.
- (b) Overhead powerlines should be de-energised and an access authority or other form of written documentation obtained from the network operator if the scaffold and the overhead powerlines is or has the potential to come within the 4 metre approach distance. Refer to Figure 10 below.
- (c) If there is the risk that the 4 metre approach distance cannot be maintained, the network operator must be contacted and a written risk assessment and safe work method statement including safe systems of work developed for the activities associated with the erection, use and dismantling of the scaffolding.

Note: Consideration must also be given to sag and swing of the conductors.



Note: End protection omitted for clarity

Figure 10 – A 4 metre approach distance applies in any direction where metallic scaffold is erected, used or dismantled near overhead power lines.

- (d) Where low voltage overhead powerlines (up to and including 1000 volts) cannot be de-energised and isolated, 'tiger tails' should be provided and installed by the network operator for the full length of the scaffolding plus a minimum distance beyond each end of the scaffolding of 5 metres. A competent person should visually inspect the tiger tails each day prior to commencing scaffolding operations. If the tiger tails have moved or been damaged the network operator must be contacted to ensure the tiger tails are replaced or located in the correct position.

Note: Tiger tails may be used to provide a useful visual indication to people working in the area of overhead power lines. They should not be regarded as providing protection against mechanical interference nor should they be regarded as providing electrical protection from electrical hazards. Refer to Section 9.1 of this code for further guidance.

- (e) Electrical wires or apparatus that pass through a scaffold must be de-energised or fully enclosed to the requirements of the network operator. These requirements must incorporate full enclosure of the wires or electrical apparatus by a non-conductive material such as moisture resistant flooring – grade particle board, dry timber, dry plywood or similar dry non-conductive material as approved by the network operator. Refer to Section 6.6 and Figure 11.
- (f) To prevent a person or anything held by a person, or attached to the person, coming closer than the 4 metre approach distance the network operator may require the erection of a hoarding on the external face of the scaffolding and, if applicable a suitable enclosure on the internal side of the scaffold. Refer to Section 6.6 and Figure 11.

Example of live low voltage overhead power lines passing through a scaffold that has been fully enclosed in a non-conductive material to the requirements of the network operator.



Figure 11 – Enclosure of overhead powerlines

6.6 Erected Scaffolding – Use of a hoarding and enclosure for reduced safety clearances

This section describes the requirements for the use of a hoarding and, if applicable, a suitable enclosure between an erected scaffolding and a live overhead power line when a non-conductive hoarding and enclosure is used to provide an impenetrable barrier to persons, tools, materials and equipment.

The A and B clearances shown in Figure 12 are horizontal safety clearances and vertical mechanical clearances from the conductors and will be advised by the network operator prior to the erection of the scaffolding near the overhead power lines.

The following installation conditions apply for the use of a hoarding and enclosure for reduced safety clearances,

- Gaps between fitted sheets of plywood must not exceed 3mm.
- No exposed cut or drilled holes are permitted in the sheets of plywood.
- Scaffolder is responsible for attaching plywood to the scaffold, and ensuring that the arrangement can sustain an appropriate wind load.
- Warning signs must be affixed to the safe side of the hoarding warning of the presence of the electrical hazard on the other side of the hoarding and warning that the hoarding must not be removed.
- A competent person should visually inspect the hoarding and, if applicable the enclosure on a daily basis to ensure the hoarding and enclosure are in a satisfactory condition and remain impenetrable.

Further guidance on the erection, dismantling and use of scaffolding can be found in the Australian Standard AS/NZS 4576 – Guidelines for Scaffolding.

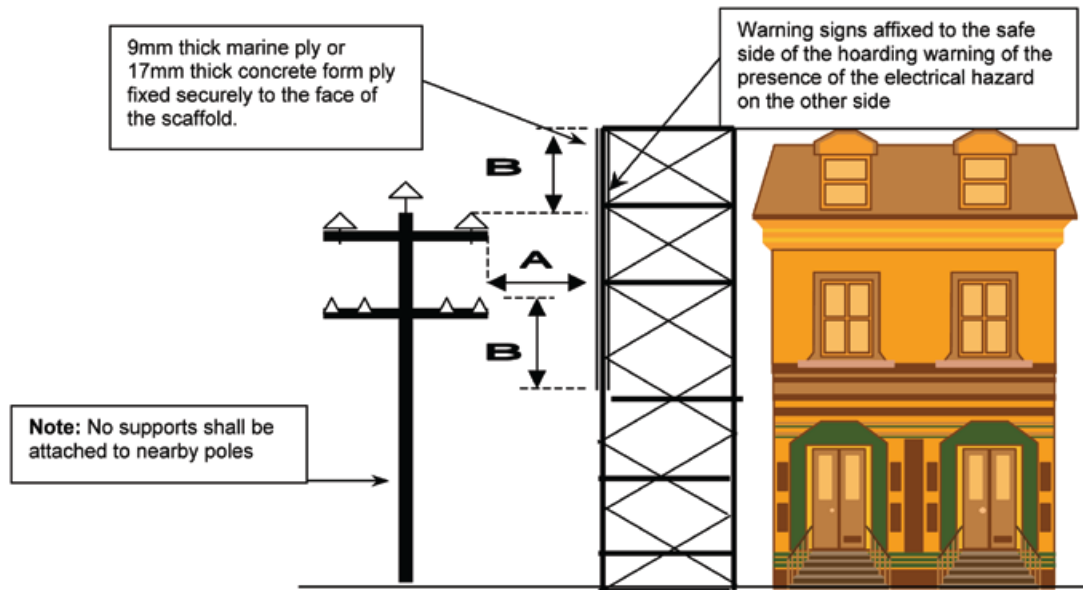


Figure 12 – Scaffolding with hoarding

CHAPTER 7 – AGRICULTURAL WORK NEAR OVERHEAD POWER LINES

7.1 Scope

In addition to the general requirements listed in Chapter 3, this chapter details any variations applicable where work is being conducted at rural workplaces where:

- the person or something the person is operating or holding could contact overhead power lines or come closer than the approach distances specified in Table 1 of this code or;
- the work creates risk of damage to overhead power lines or electrical apparatus.

Examples of such work include:

- the use of lifting or elevating plant or agricultural plant such as grain augers, hay bale elevators, cotton harvesting equipment, tipper and livestock transport trucks, travelling irrigators or harvesters under or near overhead power lines;
- handling irrigation pipes under or near overhead power lines;
- moving or relocating agricultural plant, such as folding cultivators, where the transit (stowed) height of the equipment is greater than its operating height;
- any other work that involves the risk of a person or anything attached to or held by a person, coming into contact with overhead power lines.

7.2 Hazard identification

Many people have been killed by electrocution when metal parts of agricultural plant (such as augers, field bins, harvesters or tip trucks) have come into contact with or close to live overhead power lines. Such accidents usually occur when the operator has not lowered the equipment before moving it or has raised the item of mobile plant upwards into the live overhead power lines. For example,

- working near and in the process may come into contact with machinery operating near overhead powerlines;
- driving machinery with tall attachments through paddocks where overhead powerlines exist; or
- operating or moving tipper trucks, mobile silos, field bins, harvesters or other large rural machinery (cotton harvesters, field irrigators) under or near live overhead power lines; or
- moving or re-arranging long metallic irrigation pipes.

Where work is carried out near live overhead power lines, the height and location of the power lines needs to be identified as part of an overall site hazard identification process. Contact should be made with the electricity network operator who can assist with this process.

Operators of agricultural plant and equipment also must be made aware of the design height and the transit (stowed) height of the mobile plant they operate.

7.3 Risk assessment

If a hazard involving overhead power lines has been identified, a written risk assessment must be undertaken to determine the risk of any part of the agricultural plant or equipment coming near or into contact with the overhead power lines. This step will help to determine the level of risk associated with the identified hazards and establish a priority list based on the level of risk.

The following factors may be relevant to the risk assessment:

- the type of work activities being undertaken or agricultural equipment being used;
- proximity of the work to the overhead power lines and the height of the overhead power lines;
- environmental conditions, such as rain, wind or uneven terrain, which may bring an increased risk;
- visibility of the overhead power lines and their supporting structures;
- location of overhead power lines supporting structures such as poles and towers in relation to the agricultural work to be performed;
- how often the work will need to be done near the overhead power lines;
- proximity of stationery or fixed plant and equipment to overhead power lines.

7.4 Control measures for agricultural work near overhead power lines

Once the hazards associated with agricultural work near overhead power lines have been identified and assessed then control measures must be implemented to eliminate the risk. If it is not practicable to do so, the risks associated with the hazard must then be controlled.

The use of specific control measures to eliminate or control identified risks should be done on the basis of the risk assessment. In particular, consider the following:

1. Eliminating the hazard. Identify the location of overhead power lines and relocate the plant and equipment, such as a mobile silo or tipper trucks away from the overhead power lines. Lower augers before transporting to eliminate the risk of contacting overhead power lines. Keep mobile irrigator sprayed water at least 8 metres away from overhead power lines. Consideration may also be given, following consultation and agreement of the network operator, to relocating the overhead power lines or having them run underground. In this case consult with the network operator.
2. Separating the hazard. This could mean erecting a physical barrier to prevent any part of the agricultural plant encroaching the approach distance specified in Table 1.
3. Minimising the risk by engineering means. This could mean substituting with a less hazardous material, process or equipment. This could mean, for example, filling a silo through a ground-level filler pipe on the silo rather than using a truck-mounted auger or limiting the height of all mobile plant in order to maintain safety clearances from overhead power lines.
4. Introduce administrative controls. These include:
 - planning and documenting a safe system of work before starting work;
 - developing work procedures and travel routes for equipment and vehicles that ensure workers, their equipment and containers such as field bins, stock and tipper trucks do operate near or under live overhead power lines;
 - using another worker (to act as an observer) to ensure the work activity does not come closer than the approach distances specified in Table 1

- installing warning signs on gates to paddocks or on roadways where overhead power lines exist, (Refer to Figure 13 below);



Figure 13 – Overhead power lines warning sign

- having markers installed on overhead powerlines to make them easier to see and locate.
5. Use appropriate personal protective equipment. This includes the use of rubber soled boots, gloves and safety helmets when agricultural plant or equipment is being operated near overhead power lines.

A combination of the above control measures is required to be taken to minimise the risk to the lowest level reasonably practicable if no single measure is sufficient for that purpose.

CHAPTER 8 – WORK NEAR LOW VOLTAGE OVERHEAD SERVICE LINES

8.1 Scope

In addition to the general requirements listed in Chapter 3, this chapter details any variations applicable where an ordinary person is required to carry out work near low voltage overhead service lines where the work involves:

- Minor building work such as painting; or
- Operation of motor vehicles (concrete trucks, furniture removal vans, etc); or
- Any other non-electrical work where there is a risk of contact with low voltage overhead service lines.

For the purposes of this code 'low voltage overhead service lines' covered by this chapter and illustrated in Figure 14 are:

- insulated low voltage aerial conductors and associated electrical apparatus that are connected from the point of supply (either the overhead power pole located on the street or the consumer's boundary) and terminated on the consumer's building, pole or structure at the point of attachment, or;
- insulated low voltage aerial consumers mains and associated electrical apparatus forming part of the consumer's electrical installation.

Note: For work involving cranes or mobile plant or work where any metal material is being handled (scaffolding, roofing materials and guttering) the risk control measures and increased approach distances described in other chapters of this code must be applied to the work.

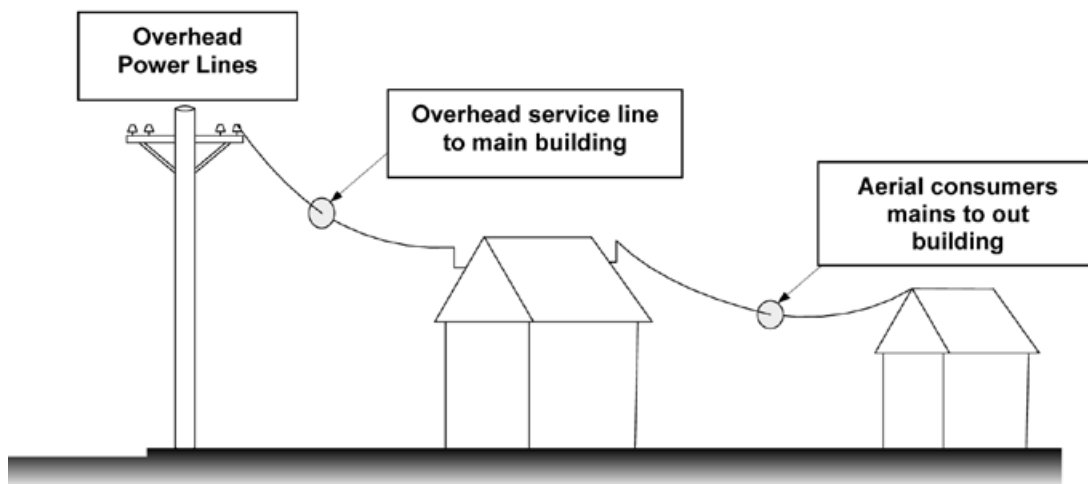


Figure 14 – Low Voltage Overhead Service Lines

8.2 Approach distances for work near low voltage overhead service lines

Table 4 provides approach distances for ordinary persons:

- performing minor building work near low voltage overhead service lines, (including hand tools held by a person); or
- operating cranes (and their loads) and items of mobile plant near low voltage overhead service lines; or
- handling metal materials near overhead service lines (such as scaffolding, roofing materials and guttering); or

- handling non-conductive materials near overhead service lines (such as timber, plywood, PVC pipes and guttering, etc); or
- driving or operating a vehicle under overhead service lines. **Note:** the approach distance specified in Table 4 is based on the fact that the design or transit envelope of the vehicle does not allow any part of the vehicle to come closer than the 0.6 metre approach distance specified.

TABLE 4

Approach distances for work near low voltage overhead service lines

Ordinary Persons (m)				
Hand held tools	Operation of crane or mobile plant	Handling of metal materials (Scaffolding, roofing, guttering, pipes, etc)	Handling of non-conductive materials (Timber, plywood, PVC pipes and guttering, etc)	Driving or operating vehicle
0.5	3.0	4.0	1.5	0.6

8.3 Work inside the relevant approach distances

If the work cannot be carried out without coming inside the relevant approach distance (ie closer than the approach distances listed in Table 4), prior to commencing work the employer or self-employed person must comply with the following requirements:

- identify the hazards,
- complete a written risk assessment for the proposed work,
- apply a safe system of work, and
- meet the requirements of the relevant network operator or in the case of overhead service lines forming part of the consumer's electrical installation, the controller of the premises.

8.4 Hazard identification

Before undertaking any work where the work might come closer than the specified approach distances an inspection of the worksite must be carried out and reasonable care taken to identify any potential hazards. Hazards associated with the low voltage overhead service lines may include:

- bare exposed live conductors;
- deteriorated or broken down insulation;
- damaged overhead service line mains connection box or damaged insulation around conductor clamps;
- deterioration of earthing of exposed conductive parts that are required to be earthed;
- voltage of the line is higher than the expected low voltage (240 / 415 volts a.c.); and
- possibility of hand held tools and equipment coming into contact with exposed live parts.

8.5 Risk assessment

If a hazard involving low voltage overhead service lines has been identified, a written risk assessment must be undertaken to determine the risk to persons encroaching within the specified approach distance for the work. This step will help determine the level of risk associated with the identified hazards and establish a priority list based on the level of risk.

The following factors may be relevant to the risk assessment:

- The type of work activities being undertaken, including how safe access and egress will be made to the work area;
- Tools or equipment being used, and the risk of mechanical damage to the low voltage overhead service lines if inadvertent contact is made with the conductors and electrical apparatus; Examples may include:
 - Handling a sheet of roofing material that inadvertently comes into contact with the service lines.
 - Use of cutting or grinding tools where the operator could lose control and come within the 0.5 metre approach distance.
- Proximity of the work to the low voltage overhead service lines;
- Environmental conditions, such as rain, wind or uneven terrain, which may bring a risk of unexpected movement of tools or equipment held by workers.

8.6 Control measures for work near low voltage overhead service lines

Once the hazards associated with work near low voltage overhead service lines have been identified and assessed then control measures must be implemented to eliminate the risk. If it is not practicable to do so, the risks associated with the hazard must then be controlled.

The use of specific control measures to eliminate or control identified risks should be done on the basis of the risk assessment. In particular, consider the following:

- Eliminating the hazard. This could involve de-energising the low voltage overhead service lines by arranging for the Network Operator or in the case of overhead service lines forming part of the consumer's electrical installation the controller of the premises to isolate the supply for the duration of the work or arranging for the re-routing of the low voltage overhead service lines away from the work area.
- Separating the hazard. If work has to be carried out in close proximity to the point of attachment and the power cannot be isolated, arrange for the Network Operator to fit insulated matting and 'tiger tails' at the point of attachment and over the overhead service lines before the work commences. Refer to Figure 15 below.

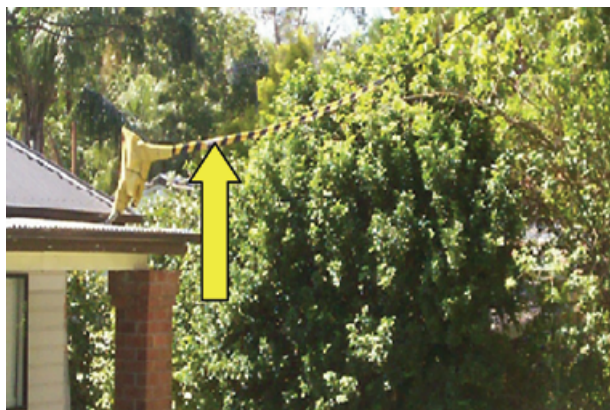


Figure 15 – Insulated matting and tiger tail fitted to overhead service line

- Minimising the risk by engineering means. This could mean substituting with a less hazardous material, process or equipment, for example, using an insulated fibreglass extension handle on a paint roller, instead of a conductive aluminium extension handle. Or carrying out sanding by hand near the point of attachment rather than using an electric disc sander.
- Introduce administrative controls such as planning and documenting the work procedures before starting work. Another administrative control could be using another worker (to act as an observer) to warn people before they encroach into the relevant approach distance.
- Use appropriate personal protective equipment. This includes the use of electrically tested insulating gloves by anyone who may be at risk of encroaching into the relevant approach distance.

A combination of the above control measures is required to be taken to minimise the risk to the lowest level reasonably practicable if no single measure is sufficient for that purpose.

CHAPTER 9 – ADDITIONAL CONSIDERATIONS FOR WORK NEAR OVERHEAD POWER LINES

9.1 Tiger tails

Tiger tails may be used to provide a useful visual indication to crane, mobile plant operators and other persons working in the area of live overhead power lines, however, they do not protect people from the risk of electrocution or electric shock.



Figure 16 – Tiger tails fitted to overhead power lines

They are **not** to be regarded as effective insulation against contact by cranes or items of mobile plant and are not to be relied upon for mechanical protection. They should not be regarded as providing protection from electrical hazards. As such, the approach distances specified in this code are to be adhered to.

Tiger tails must only be fitted to overhead power lines by an electrically qualified person who is authorised by the network operator.

A competent person should visually inspect tiger tails at the worksite on a regular basis and prior to commencing crane, scaffolding or mobile plant operations. If the tiger tails have moved or been damaged the network operator must be contacted to ensure the tiger tails are replaced or located in the correct position.



WARNING

Tiger tails do not provide protection from electrical hazards and must only be fitted to the overhead power lines by an electrically qualified person who is authorised by the network operator.

9.2 Notification of incidents



The OHS Act and the OHS Regulation require employers to notify certain classes of workplace incidents.

Whether you are an employer, self-employed person and/or occupier you are required by law to notify incidents to WorkCover NSW and/or your workers compensation insurer as soon as practicable after becoming aware of the incident.

An occupier (of premises/workplaces) is someone who, manages or has responsibility for a workplace or a particular operation at a workplace, even though they may not be the employer.

Depending on the type of incident you may need to notify WorkCover and/or your workers compensation insurer. Some incidents classified as 'serious incidents' must be notified to WorkCover immediately. These 'serious incidents' include, but are not limited to the following;

- An incident where there has been a fatality,
- An incident where there has been a serious injury, and
- An incident where there is an immediate threat to life but result in no injury or illness.

In addition to the above, the OHS Act and OHS Regulation requires that certain occurrences that occur at the work place are not to be disturbed for 36 hours, (unless performing a rescue or permission has been given by WorkCover).

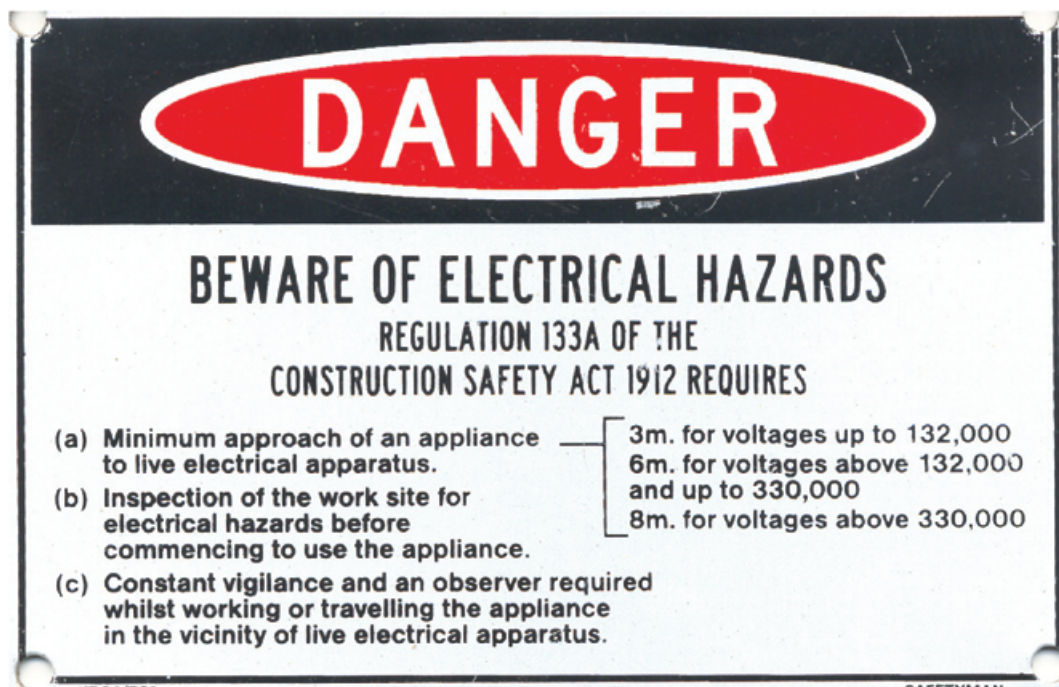
Working near overhead powerlines can be a high-risk activity and any contact with overhead power lines must be notified to WorkCover NSW and the relevant network operator in accordance with the requirements of the relevant legislation.

Serious incidents can be notified to WorkCover on **13 10 50** as an urgent investigation may be needed.

For more information regarding your legal obligations to notify incidents please refer to the OHS Act and OHS Regulation.

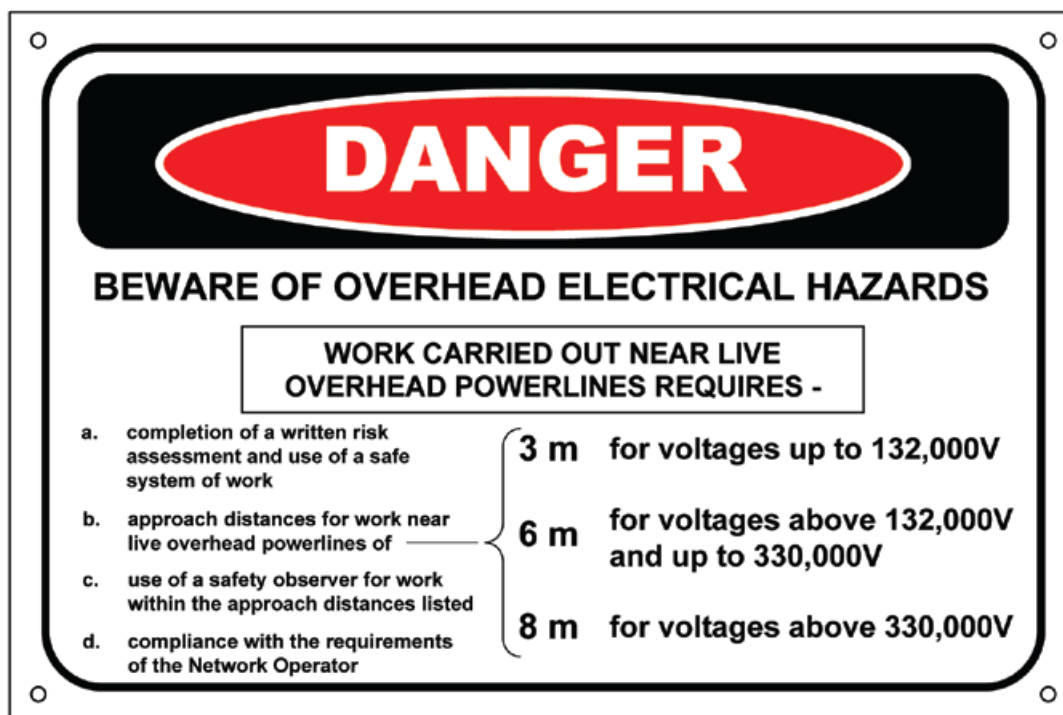
APPENDIX 1– WARNING NOTICE FOR OVERHEAD ELECTRICAL HAZARDS

(Dimensions 150 mm wide, 100 mm high, except if small plant item)



Notice that may remain fitted to cranes and mobile plant commissioned before 1 September 2001 (ie existing Notice as at the date of introduction of the OHS Regulation 2001)

Alternative Notice or Label for cranes and mobile plant commissioned after 1 September 2001



Cranes and mobile plant working near overhead power lines risk assessment checklist

Network Operator:..... Contact phone:.....

This checklist is designed to help identify the hazards associated when operating cranes or mobile plant near overhead power lines that may encroach on the approach distances specified in Table 1 of this code. The checklist covers the main items described in Chapter 4 of this code. This checklist is not designed to cover all of the risks of working near overhead power lines and should be adapted as appropriate to meet the particular circumstances.

If you mark a NO box on the checklist, you need to take appropriate action to eliminate or control the hazard.

55

Section 2 – CONTROL MEASURES – OPERATING A CRANE OR ITEM OF MOBILE PLANT NEAR LIVE OVERHEAD POWER LINES	Yes	No
Have you completed a written risk assessment and identified all electrical hazards and non-electrical hazards, both actual and potential? All materials should be regarded as conductive unless you have definite knowledge to the contrary.		
Have you developed a safe system of work for the proposed work and determined the control measures required to eliminate or control the risks?		
Have you met the requirements of the network operator for the proposed work?		
Are workers trained, competent and confident in applying the particular procedures or techniques that are required for the task at hand?		
Do workers carrying out prescribed work tasks hold the relevant certificates of competency, eg crane operator, dogman, scaffolder, rigger, EWP operator?		
Have workers been authorised by the employer or person in control of the premises to work near live overhead power lines?		
Has a safe work method statement (SWMS) been completed for the task? Note: High-risk construction requires that an SWMS is completed for the work. Refer clause 209 of the OHS Regulation for further information.		
Is the work area clear of obstructions and is there a safe entry and exit?		
Are the necessary first aid and emergency facilities provided and accessible?		
Will an Accredited Safety Observer be present during the work task and assigned the duty of observing and warning against unsafe approach to overhead power lines?		
Additional control measures for the work:		
Section 3 – AFTER COMPLETING THE WORK	Yes	No
Have all workers been advised to treat the power lines as being live from this time?		
Has the network operator and all other relevant parties been advised that the work is completed?		
Additional measures following completion of work:		

_____ / _____ / _____
 Checklist Completed By Signature (Date)

APPENDIX 3 – EXAMPLE SAFE WORK METHOD STATEMENT

Safe Work Method Statement (Part 1)				Accepted: Yes / No
Employer / Contractor: Enter the name of the employer or contractor				Signed off: Enter the name of the person approving the SWMS
Project: Enter the name of project				Date:
Job Description: Enter the task to be undertaken				
Procedure (in steps):		Possible Hazards:	Safety Risks:	Control measures:
1. Write out the job step by step (Include all major phases of the work to be done)		Include all possible hazards. Some examples of hazards are: - Working near live overhead power lines - Falls from heights - Working near moving plant	High, Medium or Low	List all safety controls such as: - Access authority - Safety Harness - Mechanical Controls / PPE - Safety Observer required
2.	Points to remember when writing out your work method statements: - Write out the job procedure step by step - Put the main idea first - Start each step with an action word. For example Isolate, erect - Use active, not passive voice. For example check approach distance, erect ground barriers - Keep sentences short and clear - Choose words carefully - Keep it simple - Get somebody who does not know the job to read the work method statement to check if they understand the job.			
3.				
4.				
5.				
				Note: The possible hazards, safety risks and control measures are placed side by side. This will make it easier for you to consider the possible hazards for each step and decide on the appropriate controls to cover each hazard.

Write all your work method statements after consulting the workers who are going to use them. You may then need to redraft them to include their suggestions. They may see a better and safer way of doing the job.

Safe Work Method Statement (Part 2)		
Project:	Enter details of duties and responsibilities of Supervisors, Plant Operators and other employees. Enter such things as daily safety checks, weekly site inspections.	
Personal Qualifications and Experience	Personnel, Duties and Responsibilities	Training required to complete proposed work
Enter all the qualifications for everybody to undertake the tasks: WorkCover Certificates, Training Certificates, Network Operator Certificates, experience in doing the tasks that may not require certificates.		Safe electrical approach training
Engineering Details / Certificates / Approvals	Legislation / Codes of Practice / Standards	Detail here the training required by all personnel before the activity is commenced.
Enter details of certification that may be required to undertake tasks. Engineers Certificates for major lifts, plant usage eg EWP's.		
Plant / Equipment	Maintenance Checks	Enter here all Legislation, Codes of Practice and Standards that is relevant to the work to be undertaken. Refer to the requirements when completing the safe work method statements.
List all major items of Plant and Equipment that will be used during the duration of the task. Eg: Mobile Crane, EWP, Vehicle loading crane, etc.		
Read and signed by all employees on site:	Detail here the system in place to ensure plant and equipment is serviced and maintained. Enter details of tagging for lifting equipment.	

Safe Work Method Statement (Part 3) Read and signed by all employees on site:

Project: *Enter name of project here*

Job Description: *Enter the task to be undertaken*

Revision No.:

Name

Company

Date Inducted

Signature

[illegible]

APPENDIX 4 – MODEL TRAINING COURSE GUIDELINES – SAFE ELECTRICAL APPROACH TRAINING

Introduction

This model training course framework provides information for registered training organisations (RTO's) wanting to develop a competency assessed training course for non electrical persons wanting to acquire the necessary knowledge and skills of an 'Accredited Person' as described in this code.

The suggested minimum structured learning time for new students is approximately 12 hours, which includes a 2 hour assessment. The subject areas listed should be considered as the minimum course requirements; RTO's may wish to add additional topics as appropriate.

Persons successfully completing the training course are to be awarded a statement of attainment or certificate from the RTO that indicates the person's name and an identifying number particular to the holder of the qualification. The name and contact details of the RTO should also be displayed on the statement of attainment or certificate.

Unit 1

Preparation to work safely near live overhead power lines as a non electrical worker Identification of the relevant legislative requirements including OHS Act 2000 and OHS Regulation 2001 including the Code of Practice – Work near overhead powerlines.

Ordinary and Accredited Persons.

Principles of electricity, 3 phase power system.

Electric shock and resuscitation.

Safe work practices and procedures.

Identification and confirmation of the approach distances for safe work and access near live overhead power lines and associated electrical apparatus.

Identification and implementation of safe systems of work including safe work method statements.

Hazard identification, risk assessment and control options prioritised.

Development of risk assessment documentation and safe work method statements.

Permit systems and established supporting procedural systems.

Responsibilities identified for the safety observer, crane and plant operator in accordance with requirements and established procedures /systems of work to ensure safety measures are followed in the event of an incident.

Reporting and notification procedures for work closer than the approach distances identified in the Code of Practice – Work near overhead powerlines.

Identification of electricity infrastructure for low voltage and high voltage overhead power lines.

Relevant approach distances as defined in the Code of Practice – Work near overhead powerlines.

Unit 2

Carry out the work safely near live overhead power lines as a non electrical worker

Application of OHS principles and practices to reduce risk of incidents with overhead powerlines.

Process for monitoring and reporting hazards and OHS risks to immediate authorised personnel for directions according to established procedures.

Non routine events.

Emergency procedures in the event of and responding to an incident.

Working safely in accordance with instructions and established routines/procedures.

Unit 3

Complete the work safely near overhead power lines as non electrical worker

Work schedules, requirements for returning work permit(s) and/or access authorisation permits.

Process for reporting to authorised personnel incidents in accordance with established procedures.

Work completion records, reports/data sheets for completed works.

Qualification and experience of the trainer:

Persons presenting the above training course should have relevant industry experience associated with the NSW Electricity Supply Industry and have as a minimum a 'Workplace Trainer and Assessor Certificate 1V' and be conversant with all the relevant NSW Acts, Regulations, Codes and Industry Guides associated with work near live overhead power lines.

Overview of assessment:

Registered training organisations should ensure that assessment of the above training course be carried out in accordance with accepted industry and regulatory practice. Evidence for competence should be considered holistically and cover the essential knowledge and associated skills for work that is to be carried out safely near live overhead power lines by a non-electrical worker.

Trainees should be assessed across a representative range of contexts from the Units listed in the model training course including,

- Preparation to work safely near live overhead power lines
- Carry out the work safely near live overhead power lines
- Complete the work safely near live overhead power lines.

Further information on training and assessment for work that is to be carried out safely near live overhead power lines by a non-electrical worker can be found in the Australian National Training Authority document UETTDRELO4A – Working safely near live electrical apparatus as a non electrical worker.

APPENDIX 5 – EMERGENCY PROCEDURE FOLLOWING CONTACT WITH LIVE OVERHEAD POWER LINES

Should contact be made with a live overhead power line or a flash-over occurs between a live overhead power line and a crane or an item of mobile plant, the following actions shall be taken:

- An attempt should be made to break the machinery's contact with the live overhead power line by moving the jib or driving the machine clear.
- If it is not possible to break the contact with the live overhead power line, the operator of the crane or mobile plant should remain inside the cabin of the crane or on the plant item. The network operator should be called immediately to isolate power to the live overhead power line. The operator must remain in place until the power has been isolated, and the 'all clear' given by the network operator.

WARNING



When a crane or item of plant inadvertently contacts overhead power lines circuit protective devices may operate to automatically turn the power off. However some protection devices are designed to automatically reclose thereby re-energising the powerlines after a short period of time, typically 1 – 4 seconds.

- If it is essential to leave the cabin or the operator's position due to fire or other life threatening reason, then jump clear of the equipment. Do not touch the equipment and the ground at the same time. When moving away from the equipment, the operator should hop or shuffle away from the plant item (with both feet together) until at least eight metres from the nearest part of the crane or plant. Under no circumstances run or walk from the crane or item of plant as voltage gradients passing through the ground may cause electricity to pass through the body resulting in an electric shock.
- Warn all other personnel and members of the public to keep 8 metres clear from the crane or item of plant. Do not touch or allow persons to touch any part of the crane or plant item and do not allow persons to approach or re-enter the vehicle until the network operator has determined the site safe. Remember electricity flows through the ground, so an electric shock could be received from walking close to the scene. If the crane or plant operator is immobilised, ensure the power supply has been isolated and the site made safe before giving assistance.
- Untrained, unequipped persons should not attempt to rescue a person receiving an electric shock. All too often secondary deaths occur because others get electrocuted trying to help earlier victims. If the crane or plant operator is immobilised, ensure the power supply has been isolated and the site has been made safe before giving assistance.

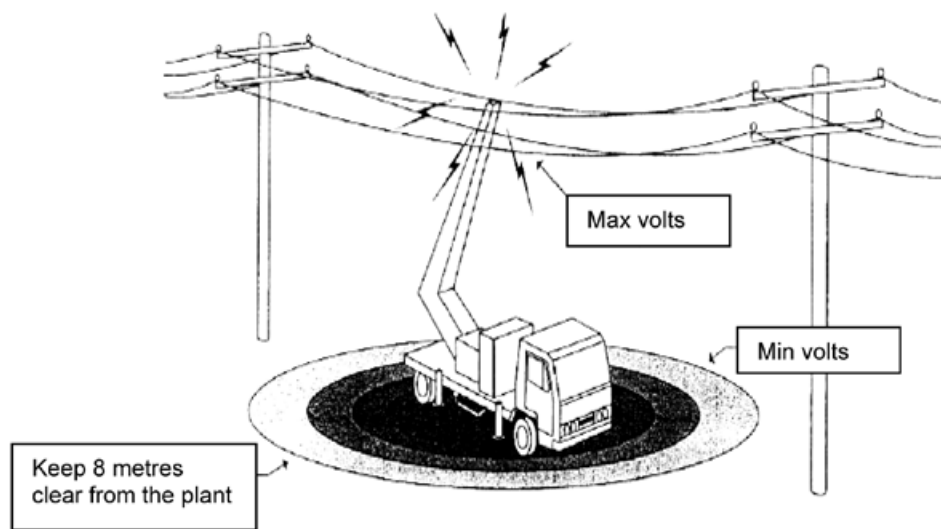


Figure 17: Affected area surrounding mobile plant when in contact with a live overhead power line

Post – incident inspection by a competent person

When a crane or item of mobile plant has been in contact with a live overhead power line, it should be checked by a competent person for any damage to the components of the crane or mobile plant. Any actions recommended by the competent person are to be completed before the crane or mobile plant is returned to service.

Tyres on cranes and mobile plant that have been in contact with overhead power lines where electrical flash-over and current flow occurs through the rubber tyres should be considered as a potential hazard. These rubber tyres may catch fire, with the obvious potential for them to explode. Additionally, a lesser known danger may occur, which results when combustion takes place within the tyre, with no apparent external signs. When excessive heat is developed in or applied to a tyre as in the case from contact with overhead power lines, it can initiate a process known as pyrolysis, which is the decomposition of a substance by heat. This can generate a build up of flammable gases and pressure within the tyre, which may ultimately rupture or explode.

Vast amounts of energy can be released by a tyre explosion, often leading to significant equipment damage, serious injuries or fatalities. Pyrolysis related explosions are very unpredictable, and have been known to occur immediately or up to 24 hours after initiation. An explosion can occur where no fire is visible and the danger area can be up to 300 metres from the tyre.

Any rubber tyred crane or plant item involved in an incident where contact is made with overhead power lines which results in discharges or flash-over of electrical current through the tyres should be considered as a potential hazard. If any personnel suspect there is a danger of a tyre explosion, as in the case of the mobile crane contacting overhead power lines, then the procedure should include:

- parking the crane in an isolation zone, with a minimum 300 metre radius,
- removing all personnel from the area, and not allowing access to isolation zone for 24 hours, and
- alerting fire fighting services

APPENDIX 6 – CASE STUDIES OF OVERHEAD POWER LINE INCIDENTS

CASE 1

Incident – Mobile Crane Operation

A mobile crane came into contact with 132,000 volt overhead power lines that were located adjacent to a worksite. At the time of the incident the crane driver had slewed the boom of the crane towards the overhead power lines, which resulted in the lifting chains swinging outwards, making contact with the power line.

Luckily no persons were injured, however the crane sustained extensive damage to the tyres, lifting rope and electrical system on the crane.

Contributing factors and relevant sections

Failure to:

- maintain relevant approach distance to the power lines and take outcome of the possibility of the lifting chains swinging towards the overhead power lines when the crane was operated. – Section 3.3
- carry out an adequate risk assessment of the worksite – Section 4.3
- implement appropriate control measures for the work – Section 4.4
- use a safety observer to observe the crane operations near the power lines – Section 4.7

CASE 2

Incident – Scaffolding Work

A worker died and three apprentice roof plumbers were injured when attempting to move an 8.9 metre high aluminium scaffold at a construction site. At the time of the incident the workers were moving the mobile scaffold over soft sand when the castor wheels located at the base of the scaffold sunk into the sand causing it to fall and make contact with 33,000 volt overhead power lines that were located adjacent to the construction site.

As a result of this incident the construction firm and roofing contractor were fined a total of \$224,000 by the NSW Industrial Relations Commission.

Contributing factors and relevant sections

Failure to:

- carry out an adequate risk assessment of the worksite that took account of the ground conditions at the worksite – Section 4.3
- implement appropriate control measures for the work – Section 4.4.

CASE 3

Incident – Work on a rural property

The victim, a 17 year old rural worker, received a fatal electric shock due to a flashover when a steel flagpole came into close proximity with an 11kV overhead power line that was located above the entrance to a rural property. At the time of the incident the worker was attempting to erect the 5.2m flag pole at the main entrance gate to the property.

Contributing factors and relevant sections

Failure to

- identify the hazard of the overhead power lines – Section 7.2
- carry out a risk assessment of the worksite and implement appropriate risk controls – Sections 7.3 and 7.4.

CASE 4

Incident – Tipper truck operation

A tipper truck contacted an 11,000 volt overhead power line causing it to break and fall to the ground striking a worker who was at the worksite. At the time of the incident the tip truck was delivering a load of granulated bitumen to the worksite when the tip tray of the truck was raised upwards into the overhead power lines.

As a result of this incident the NSW Chief Industrial Magistrates Court fined the construction firm a total of \$15,000.

Contributing factors and relevant sections

Failure to:

- plan the work and identify the hazard of the overhead power lines – Section 2.5 and 4.2
- maintain the relevant approach distance to the overhead power lines and take account of the height of the raised tray when the load was dumped at the worksite. Sections 3.3
- carry out a risk assessment of the worksite – Sections 3.7 and 4.3
- implement appropriate control measures for the work – Section 4.4
- use a safety observer to observe the truck operations near the power lines – Section 4.7.

APPENDIX 7 – USEFUL PUBLICATIONS

WORKCOVER NSW APPROVED INDUSTRY CODES OF PRACTICE

- *Code of Practice: Occupational Health and Safety Consultation*
- *Code of Practice: Risk assessment*
- *Code of Practice: Occupational Health and Safety induction training for construction work*
- *Code of Practice: Moving plant on Construction Sites*
- *Code of Practice: Amenity Tree Industry*
- *Code of practice: Technical Guidance*

Note: The Australian Standards listed below are also WorkCover approved industry codes of practice.

WORKCOVER GUIDES

- *Identification Tool for Electrical Hazards on-site*
- *Subby Pack – OHS contractor management tool*
- *Dangers of Power Lines when Pumping Concrete*
- *WorkCover Safety Alert – Tiger Tails*

Standards and Codes offer practical guidance on health and safety for work. However, these are subject to change from time to time. For further information contact the WorkCover Assistance Service on: **13 10 50**.

For information about the wide range of other codes of practice, certification guides and publications on OHS, rehabilitation and workers compensation, contact the Publications Order line: 1300 797 003.

Information on the latest laws can be checked at www.legislation.nsw.gov.au or contact (02) 9238 0950 or 1800 463 955 (NSW country only).

AUSTRALIAN STANDARDS

Australian Standards can be purchased from SAI Global by contacting the Customer Service Centre on 131 242 or over the net at <http://www.saiglobal.com/shop>

- | | |
|--------------------|---|
| AS 2550.1 | Crane, hoist and winches – Safe use Part 1: General requirements |
| AS 2550.1 | Crane, hoist and winches – Safe use Part 5: Mobile and vehicle loading cranes |
| AS/NZS 4576 | Guidelines for Scaffolding |

NATIONAL ELECTRICITY NETWORK SAFETY GUIDELINES

National Guidelines can be purchased from the Electricity Supply Association of Australia by phoning 03 9670 0188 or over the net at <http://www.esaa.com.au>

- NENS 04-2003 *National guidelines for safe approach distances to electrical apparatus*

NETWORK OPERATORS – CONTACT NUMBERS

- Energy Australia: 13 15 25
- Integral Energy: 13 10 81
- Country Energy: 13 23 56
- Rail Corp: (02) 9379 4911
- Transgrid is divided into three regional areas:
 - Central Region – 1800 625 108
 - Northern Region – 1800 998 049
 - Southern Region – 1800 654 195.

Catalogue No. **WC01394** WorkCover Publications Hotline **1300 799 003**



WorkCover NSW 92-100 Donnison Street Gosford NSW 2250
Locked Bag 2906 Lisarow NSW 2252 WorkCover Assistance Service **13 10 50**
Website **www.workcover.nsw.gov.au**

©Copyright WorkCover NSW 0408

**Appendix C – Endeavour Energy Drawing no.86232 Overhead Lines Minimum
Clearances Near Structures**

1										2										3										4										5										6																																																																																									
AMENDMENTS										G										U ≤ 1000V										U > 1000V										1000V < U ≤ 33kV										33kV < U ≤ 132kV																																																																																									
A ORIGINAL ISSUE										DR'N KT CH'D MC DATE 24.08.06 JR No										INSULATED										BARE NEUTRAL										BARE ACTIVE										INSULATED WITHOUT EARTHED SCREEN (mm)										INSULATED WITH EARTHED SCREEN (mm)										BARE CONDUCTORS (mm)										BARE CONDUCTORS (mm)																																																											
J R No. NA										ROW G ADDED TO TABLE. VOLT BANDS REVISED. ROWS B,C AND LAST ROW AMENDED. NOTES AMENDED. DIAGRAM AMENDED.										(mm)										(mm)										(mm)										(mm)										(mm)										(mm)																																																																					
B DR'N C.R.T. CH'D C.R.T. DATE 16-2-95 JR No 930208										H TME MC DR'N BF CH'D SD DATE 05.09.08 JR No XDSSTD										2700										2700										3700										3700										2700										4500										5000																																																											
REDRAWN: OH SHEET										CLEARANCES - INSULATED WITHOUT EARTH SC WAS 5500,BARE CONDUCTORS WERE 5500,6700										2000										2700										2700										2700										2700 NOTE 4										3700										4500																																																											
C SEO C.H.B. DR'N C.R.T. CH'D C.R.T. DATE 13-7-95 JR No 950099										J DMC S. DANIEL DR'N G.S.F. CH'D SD DATE 27.03.09 JR No --										1000										900 NOTE 5 (1000)										1500										1500										1500 NOTE 4										2100										3000																																																											
TABLE AMENDED.										CLEARANCES - INSULATED ROW E WAS 1250 NOW 1800										D IN ANY DIRECTION (OTHER THAN VERTICALLY ABOVE) FROM THOSE PARTS OF ANY STRUCTURE NORMALLY ACCESSIBLE TO PERSONS, OR FROM ANY PARTS NOT NORMALLY ACCESSIBLE TO PERSONS BUT ON WHICH A PERSON CAN STAND										100 NOTE 2										300 NOTE 2										600 NOTE 2										600										100										1500										2500																																																	
D SEO C.H.B. DR'N C.R.T. CH'D C.R.T. DATE 15-8-96 JR No 950156										K OH&UG MM D.MATE NOTE 5-7500 WAS 7300 AND BRACKETED NUMBERS REVERSED. INSULATED VALUES CHANGED FOR B&C.										E IN ANY DIRECTION FROM ANY PART OF AN OUTDOOR TELEVISION ANTENNA OR PART OF A STAYWIRE										1800										1800										1800										3000										3000										3000										3000																																																	
INTEGRAL WAS PE, SHEET WAS A2.																				F IN ANY DIRECTION FROM CLOTHES LINE										2000										3000										3000										3000										3000										3000										3000																																																	
MPDO CHB DR'N C.R.T. CH'D C.R.T. DATE 03-3-97 JR No 950156																				G IN ANY DIRECTION FROM GROUND (OTHER THAN THE CARRIAGEWAY OF ROADS).										5500 NOTE 6										5500										5500										5500 NOTE 5 (7500)										5500										5500 NOTE 5 (7500)										6700 NOTE 5 (7500)																																																	
VOLT BANDS REVISED																				VERTICALLY ABOVE THE CARRIAGEWAY OF ROADS										5500										5500										5500										6000 NOTE 5 (7500)										5500										6700 NOTE 5 (7500)										6700 NOTE 5 (7500)																																																	
MPDO CHB DR'N F.M. CH'D F.M. DATE 28/2/03 JR No XD3MAINO																																																																																																																																											
FORMAT WAS GDS. DIM 1250 WAS 1800 ROW E. REGULATION TITLE ALTERED. YR 1999 WAS 1991.																																																																																																																																											
DMC GB																																																																																																																																											
																																																																																																																																											

GENERAL NOTES

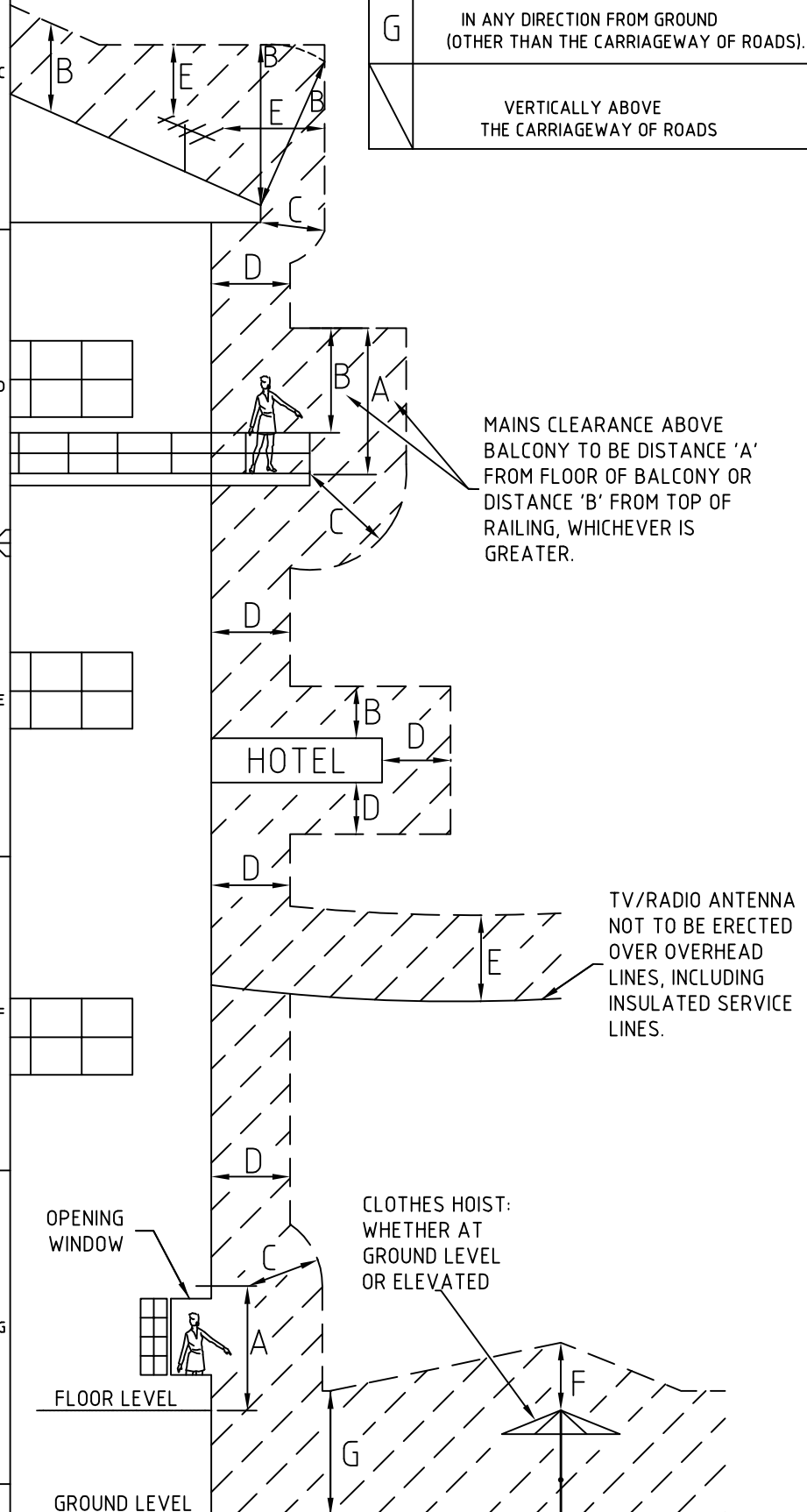
1. THE POINT OF ATTACHMENT IS HERE DEFINED AS THE POINT AT WHICH Endeavour Energy'S AERIAL SERVICE MAINS JOIN ONTO THE CONSUMERS BUILDING OR STRUCTURE OR ELSE THE FIRST POLE PAST THE BOUNDARY OF THE CONSUMERS PREMISES.
2. THIS CLEARANCE MAY BE REDUCED TO ALLOW FOR TERMINATION AT POINT OF ATTACHMENT.
3. FOR CLEARANCE REQUIREMENTS OF INSULATED AERIAL SERVICE MAINS, REFER Endeavour Energy'S DRAWING 011985.
4. HIGH VOLTAGE NON-METALIC SCREENED AERIAL BUNDLED CONDUCTOR (NMS-HV ABC) IS CLASSIFIED AS INSULATED WITH EARTHED SCREEN FOR CLEARANCE PURPOSES, EXCEPT FOR DIMENSIONS B & C.
5. TO KEEP LINES BEYOND THE REACH OF PERSONS, THE DESIGN CLEARANCES (SHOWN IN BRACKETS) REQUIRED BY Endeavour Energy IN THESE SITUATIONS ARE GREATER THAN THOSE REQUIRED BY INDUSTRY GUIDELINES.
6. DOES NOT INCLUDE INSULATED SERVICE LINES.

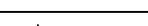
MINIMUM CLEARANCE REQUIREMENTS

MINIMUM SAFE CLEARANCES ARE SPECIFIED IN ELECTRICITY SUPPLY (SAFETY & NETWORK MANAGEMENT) REGULATION 2008, & GUIDELINES FOR DESIGN & MAINTENANCE OF OVERHEAD DISTRIBUTION & TRANSMISSION LINES (ENA C(b)1-2006).
DETAILS SHOWN ON THIS DRAWING COMPLY WITH ENDEAVOUR ENERGY PRACTICE.

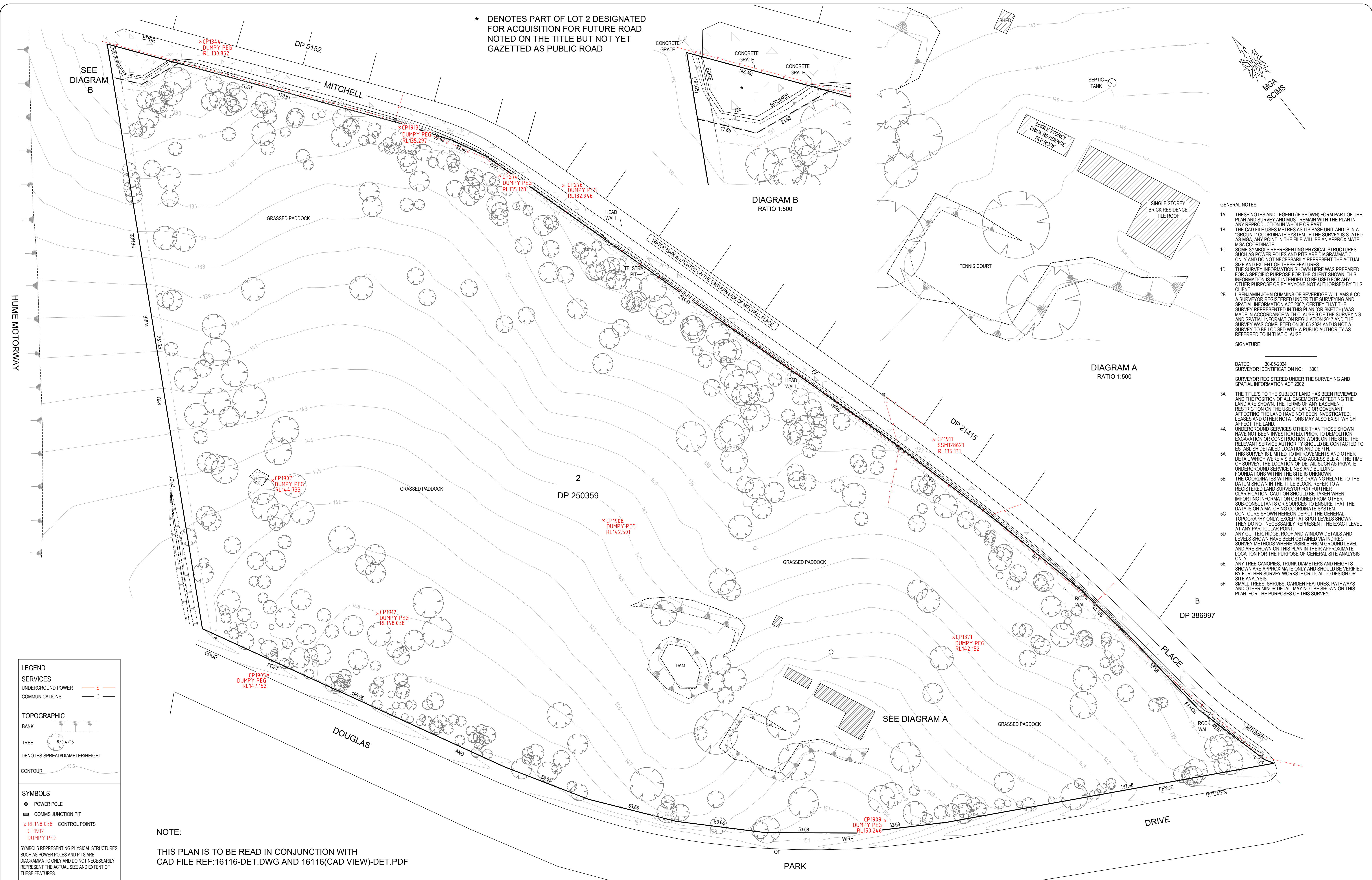
THESE CLEARANCES ARE THE MINIMUM NECESSARY WHEN ANY Endeavour Energy OVERHEAD LINE WILL BE IN ITS CLOSEST POSITION TO THE BUILDING OR OTHER STRUCTURE DURING STRONG WINDS OR MAXIMUM OPERATING TEMPERATURE (EXCLUDING FAULT CURRENTS OR EMERGENCY LOAD CURRENTS). UNDER THESE CONDITIONS, CONDUCTOR MAY SWING OR SAG CONSIDERABLY TOWARDS THE BUILDING OR STRUCTURE COMPARED WITH NORMAL CONDITIONS. ADEQUATE ALLOWANCE SHOULD BE MADE FOR THIS POSSIBLE SWING OR SAG OF CONDUCTORS.

OVERHEAD LINES MUST NOT COME WITHIN HATCHED AREAS.
MINIMUM CLEARANCES SHOWN ARE FOR Endeavour Energy
OVERHEAD LINES UP TO THE POINT OF ATTACHMENT
(AS DEFINED IN NOTE 1).
MINIMUM CLEARANCES PAST THE POINT OF ATTACHMENT ARE TO
BE IN ACCORDANCE WITH SAA WIRING RULES (AS/NZS3000).



		This drawing and the copyright therein is the property of Endeavour Energy and may not be copied, reproduced, distributed, loaned or used without the written consent of Endeavour Energy.		REFERENCE DRAWINGS		DO NOT SCALE DIMENSIONS IN MILLIMETRES		AUTHORISED W. ISLEY		MGR TRANSMISSION MAINS		16-2-95	
ORIGINAL SCALE NONE		APPROVED C. BROWN		DO NOT SCALE DIMENSIONS IN MILLIMETRES		DO NOT SCALE DIMENSIONS IN MILLIMETRES		AUTHORISED W. ISLEY		MGR TRANSMISSION MAINS		16-2-95	
DRAWN C. R. T.		DATE 16-2-95		CH'D		Endeavour Energy OVERHEAD LINES MINIMUM CLEARANCES NEAR STRUCTURES		A2P		086232		K	
										SHEET No. 1 OF 1 SHEETS			

Appendix D – Survey Drawing ref: 16116-DET



GENERAL NOTES

1A THESE NOTES AND LEGEND (IF SHOWN) FORM PART OF THE PLAN AND SURVEY AND MUST REMAIN WITH THE PLAN IN ANY REPRODUCTION IN WHOLE OR PART.

1B THE CAD FILE USES METRES AS ITS BASE UNIT AND IS IN A 'GROUND' COORDINATE SYSTEM. IF THE SURVEY IS STATED AS MGA, ANY POINT IN THE FILE WILL BE AN APPROXIMATE MGA COORDINATE.

1C SOME SYMBOLS REPRESENTING PHYSICAL STRUCTURES SUCH AS POWER POLES AND PITS ARE DIAGRAMMATIC ONLY AND DO NOT NECESSARILY REPRESENT THE ACTUAL SIZE AND EXTENT OF THESE FEATURES.

1D THE SURVEY INFORMATION SHOWN HERE WAS PREPARED FOR A SPECIFIC PURPOSE FOR THE CLIENT SHOWN. THIS INFORMATION IS NOT INTENDED TO BE USED FOR ANY OTHER PURPOSE OR BY ANYONE NOT AUTHORISED BY THIS CLIENT.

2B I, BENJAMIN JOHN CUMMINS OF BEVERIDGE WILLIAMS & CO, A SURVEYOR REGISTERED UNDER THE SURVEYING AND SPATIAL INFORMATION ACT 2002, CERTIFY THAT THE SURVEY REPRESENTED IN THIS PLAN (OR SKETCH) WAS MADE IN ACCORDANCE WITH CLAUSE 9 OF THE SURVEYING AND SPATIAL INFORMATION REGULATION 2017 AND THE SURVEY WAS COMPLETED ON 30-05-2024 AND IS NOT A SURVEY TO BE LODGED WITH A PUBLIC AUTHORITY AS REFERRED TO IN THAT CLAUSE.

SIGNATURE _____

DATED: 30-05-2024
SURVEYOR IDENTIFICATION NO: 3301
SURVEYOR REGISTERED UNDER THE SURVEYING AND SPATIAL INFORMATION ACT 2002

3A THE TITLES TO THE SUBJECT LAND HAS BEEN REVIEWED AND THE POSITION OF ALL EASEMENTS AFFECTING THE LAND ARE SHOWN. THE TERMS OF ANY EASEMENT, RESTRICTION ON THE USE OF LAND OR COVENANT AFFECTING THE LAND HAVE NOT BEEN INVESTIGATED. LEASES AND OTHER NOTATIONS MAY ALSO EXIST WHICH AFFECT THE LAND.

4A UNDERGROUND SERVICES OTHER THAN THOSE SHOWN HAVE NOT BEEN INVESTIGATED. PRIOR TO DEMOLITION, EXCAVATION OR CONSTRUCTION WORK ON THE SITE, THE RELEVANT SERVICE AUTHORITY SHOULD BE CONTACTED TO ESTABLISH DETAILED LOCATION AND DEPTH.

5A THIS SURVEY IS LIMITED TO IMPROVEMENTS AND OTHER DETAIL WHICH WERE VISIBLE AND ACCESSIBLE AT THE TIME OF SURVEY. THE LOCATION OF DETAIL SUCH AS PRIVATE UNDERGROUND SERVICE LINES AND BUILDING FOUNDATIONS WITHIN THE SITE IS UNKNOWN.

5B THE COORDINATES WITHIN THIS DRAWING RELATE TO THE DATUM SHOWN IN THE TITLE BLOCK. REFER TO A REGISTERED LAND SURVEYOR FOR FURTHER CLARIFICATION. CAUTION SHOULD BE TAKEN WHEN IMPORTING INFORMATION OBTAINED FROM OTHER SUB CONSULTANTS OR SOURCES TO ENSURE THAT THE DATA IS ON A MATCHING COORDINATE SYSTEM.

5C CONTOURS SHOWN HEREON DEPICT THE GENERAL TOPOGRAPHY ONLY. EXCEPT AT SPOT LEVELS SHOWN, THEY DO NOT NECESSARILY REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT.

5D ANY GUTTER, RIDGE ROOF AND WINDOW DETAILS AND LEVELS SHOWN HAVE BEEN OBTAINED VIA INDIRECT SURVEY METHODS WHERE VISIBLE FROM GROUND LEVEL AND ARE SHOWN ON THIS PLAN IN THEIR APPROXIMATE LOCATION FOR THE PURPOSE OF GENERAL SITE ANALYSIS ONLY.

5E ANY TREE CANOPIES, TRUNK DIAMETERS AND HEIGHTS SHOWN ARE APPROXIMATE ONLY AND SHOULD BE VERIFIED BY FURTHER SURVEY WORKS IF CRITICAL TO DESIGN OR SITE ANALYSIS.

5F SMALL TREES, SHRUBS, GARDEN FEATURES, PATHWAYS AND OTHER MINOR DETAIL MAY NOT BE SHOWN ON THIS PLAN, FOR THE PURPOSES OF THIS SURVEY.

LEGEND

SERVICES

UNDERGROUND POWER — E —

COMMUNICATIONS — C —

TOPOGRAPHIC

BANK

TREE 8/0.4/15

DENOTES SPREAD/DIAMETER/HEIGHT

CONTOUR 90.5

SYMBOLS

● POWER POLE

■ COMMS JUNCTION PIT

x RL14.8.038 CONTROL POINTS

CP1912 DUMPY PEG

SYMBOLS REPRESENTING PHYSICAL STRUCTURES SUCH AS POWER POLES AND PITS ARE DIAGRAMMATIC ONLY AND DO NOT NECESSARILY REPRESENT THE ACTUAL SIZE AND EXTENT OF THESE FEATURES.

NOTE:

THIS PLAN IS TO BE READ IN CONJUNCTION WITH CAD FILE REF:16116-DET.DWG AND 16116(CAD VIEW)-DET.PDF

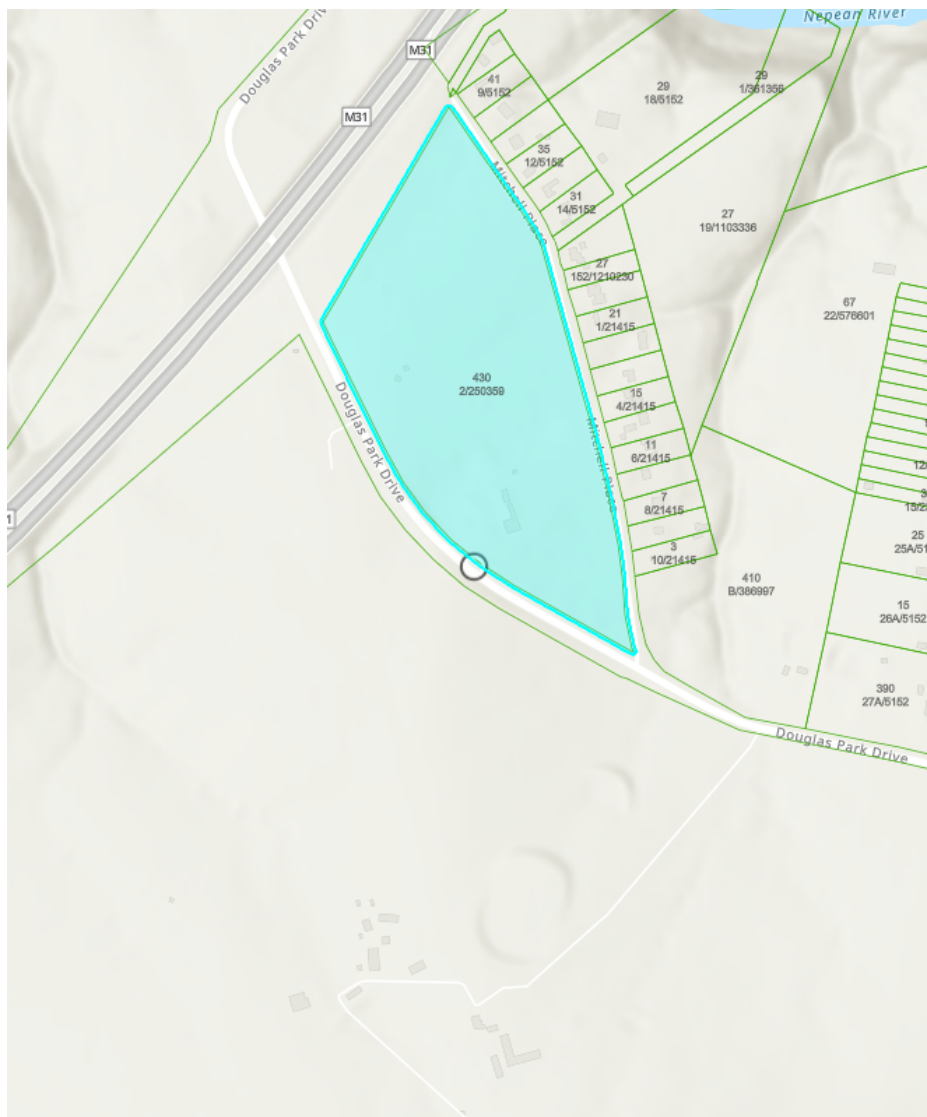
VER	BY	AMENDMENTS	DATE	THE POSITION OF SERVICES SHOWN ON THIS DRAWING ARE INDICATIVE ONLY AND HAVE BEEN PLOTTED FROM PLANS AND DRAWINGS SUPPLIED BY RELEVANT AUTHORITIES. SERVICE AUTHORITY PITS, MANHOLES, POLES, MARKER POSTS, ETC. WHERE SIGHTED AT THE TIME OF SURVEY, HAVE BEEN LOCATED. THE SURVEY DOES NOT INCLUDE INVESTIGATION OR LOCATION OF UNDERGROUND INFRASTRUCTURE. SERVICES INFORMATION SHOWN ON THIS DRAWING HAS BEEN OBTAINED THROUGH A DIAL BEFORE YOU DIG SEARCH AND IS VALID FOR THE PERIOD OF THE FROM THE DATE OF ISSUE NOTIFIED BY THE AUTHORITY. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON OR ADJACENT TO THE SITE IT IS THE RESPONSIBILITY OF THE DEVELOPER AND CONTRACTORS TO APPLY FOR AND OBTAIN UP TO DATE PLANS THROUGH A NEW DIAL BEFORE YOU DIG SEARCH AND TO CONTACT ALL THE RELEVANT AUTHORITIES TO ESTABLISH AND CONFIRM THE DETAILED LOCATION AND DEPTH OF ALL UNDERGROUND SERVICES.	CLIENT: BENIMA	BW Beveridge Williams Development and Infrastructure Consultants Western Sydney (02) 4625 5055 www.beveridgewilliams.com.au	DETAILS: PLAN OF DETAIL AND CONTOURS OVER SITE LOT 2 IN DP250359 DOUGLAS PARK DRIVE DOUGLAS PARK	ORIGINAL SHEET SIZE A1 SCALE 1:1000 CAD REFERENCE: 16116-DET 0 20 40 60 SCALE ON ORIGINAL DRAWING AT 1:1000	SURVEYOR: — DRAWN: AA CHECKED: BC SURVEY DATE: N/A VERTICAL DATUM: AHD HORIZONTAL DATUM: MGA 2020	PROJECT No. 16116 DRAWING REF. 16116-DET VERSION A SHEET 1 OF 1
A	BC	ORIGINAL ISSUE	31-05-2024							

Appendix E – Endeavour Energy Preliminary Application and Response

18 March, 2025

Preliminary Enquiry**ENL6588****Site Details**

LGA Name		WOLLONDILLY			
Main Address	Address	Lot	Section	DP	Part Lot
☒	430 DOUGLAS PARK DRIVE, DOUGLAS PARK, New South Wales, 2569	2		250359	☐



Application Details

Service Type	Connections related Technical or preliminary Enquiry
Is this enquiry for large Generators 5MW and above?	No
Application Request Description	This Enquiry is for a Cemetery/Crematorium to be established at 430-490 Douglas Park Rd. The maximum demand from the Electrical Consultant is attached and is approx 900A/phase, and will therefore require a PM Sub. Please provide some detail as to where we could expect to get a HV Connection from as well as whether the 11kV Feeder has enough capacity for an additional 900A/phase @ 400V supply. Also any in-principle acceptance that Endeavour Energy may have, so that we can use this letter for the Development Planner.

Supporting Documents

	Concept Site Plan- Lot 2 Douglas Park Memorial Park.pdf 7m ago
	30711 Douglas Park MD rev2.pdf 7m ago
☒ Site Plan or Sketch or Photos	

Contact Details

Applicant	☒
Contact Name	Paul Anthony
Company Name	Paul Anthony Electrical Pty Ltd
Contact Number	0417442291
Email	paul.anthony@pae.net.au
Address	23 Amaroo Avenue, Figtree NSW, 2525

Developer	☒
Contact Name	William Singer
Company Name	Benima Pty Ltd
Contact Number	0427137126
Email	wsinger@htbuilding.com.au
Address	72 Glendower Street, Gilead NSW, 2560

Have you engaged an Accredited Service Provider associated with this application?

Yes

Non Refundable Fee

You are about to proceed to make a payment. Any payments made as part of the application submission are non-refundable. Please ensure that:

1. The application has not already been submitted and paid. All submitted projects will be shown in your dashboard. It may take up to 24 hours for the payment to be reflected in the dashboard.
2. The type of application you are about to submit is correct. If you are unsure or need further information, please contact us at cwadmin@endeavourenergy.com.au or on **02 9853 7977**.

Legal Disclaimer

By submitting this application, as the Applicant you agree to the following:

1. If Endeavour Energy is satisfied that the service requested by me falls within the terms of Endeavour Energy's Model Standing Offers, then I will have taken to have accepted a connection offer by Endeavour Energy on the terms of the relevant Model Standing Offer on the date that Endeavour Energy receives this application.
2. I consent to the release of my contact details to other customers with similar works in progress nearby to facilitate co-operation in design and construction activities.
3. I accept that all correspondence relating to my application will be sent to my nominated email address.

If you need to discuss any of the above points, please contact us at **Customer Network Solutions** on **02 9853 7977** or email cwadmin@endeavourenergy.com.au.

☒ Applicant Acceptance of the above agreement

ELECTRICAL SERVICES EMD

Lot 2 Douglas Park Drive, Douglas Park

Project:		30711
Engineer:		JT
Sheet:		1 of 1
Date Modified:		18 March 2025

Occupancy Type	Units	Qty	Demand (VA/m2)	kVA	Amps per Phase	Notes
Total Building Load			kVA	623.08	Amps	899.3385143
Site				Total kVA		623.08
Crematorium building	1	380	80	30.40	43.88	
Electric cremator #1 equipment (point load)	1			210.00	300.00	
Electric cremator #2 equipment(point load)	1			210.00	300.00	
Chapel building	1	650	80	52.00	75.06	
Administration building	1	570	120	68.40	98.73	
Care taker buildng	1	216	80	17.28	24.94	
Pathway/car parking bay (60no pole light to serve 3km of pathway (54W/fitting@50m spacing)	1	60	500	30.00	43.30	
Water feature ponds	1	1	5000	5.00	25.00	

Mark Ellul

From: Paul Anthony <paul.anthony@pae.net.au>
Sent: Monday, 24 March 2025 1:06 PM
To: William Singer
Cc: John Truong; Mark Ellul
Subject: FW: ENL6588 - 430 DOUGLAS PARK DRIVE DOUGLAS PARK - Reply from Endeavour Energy
Attachments: HV MARKUP.jpg

Gents, see below and attached reply from Endeavour Energy following the lodgement of the Enquiry regarding the power supply to the Douglas Park Rd site. It does say that there is sufficient capacity in the 11kV Line for this development. The best way to secure this load, is to start the formal Application process. Let me know if/when you want to proceed.

Thank you

PAUL ANTHONY
Director & Principal Engineer
Paul Anthony Electrical Pty Ltd
t/a **Wollongong REZ | Electrify 25xx**
Level 3 Design | Electrical Engineering Consultancy | Renewable Energy Solutions
Mob: 0417 442 291
Email: paul.anthony@pae.net.au

From: John Le <John.Le@endeavourenergy.com.au>
Sent: Monday, 24 March 2025 12:15 PM
To: Paul Anthony <paul.anthony@pae.net.au>
Subject: ENL6588 - 430 DOUGLAS PARK DRIVE DOUGLAS PARK - Reply

Hi Paul,

In reply to your enquiry,

Network Planning has the following HV requirement for **ENL6588 - 430 DOUGLAS PARK DRIVE DOUGLAS PARK:**

1. **There is sufficient capacity on adjacent 11kV W111 at this point in time to supply this application.**
2. **Preference for the installed new 11kV 1000 PM substation with 2 FDR RMU to ring into conductor running along Mitchell Pl, to establish inherent network backup in event of an outage, via two new HV UGOHs and cable.**
3. **Substation to have its switches automated.**

John Le | Customer Solutions Engineering Specialist

P 9853 7658 M 0447 170 224
Level 40-42, 8 Parramatta Square, 10 Darcy Street
Parramatta NSW 2150. Dharug Country
endeavourenergy.com.au |    



**Endeavour
Energy**

**POWER
together**



Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past, present and emerging.

The information contained in this e-mail and/or attachments to it may contain confidential or privileged information. If you are not the intended recipient, any dissemination, use, review, distribution, printing or copying of the information contained in this e-mail message and/or attachments to it is strictly prohibited. If you have received this communication in error, please notify us by reply e-mail and permanently delete the message and any attachments. Endeavour Energy respectfully acknowledges the Traditional Custodians on whose lands we live, work, and operate and their Elders past and present..

Appendix F – Indicative Site Services Plan



NOTE:
ELEMENTS SHOWN FOR DESIGN INTENT PURPOSES ONLY. FINAL DETAILING TO BE SUBJECT TO DETAILED DESIGN.

ELECTRICAL PILLAR-5
SIZE 1mW X 0.4mD X 1.2mH.
ALLOW 1.4m CLEAR SPACE IN FRONT OF PANEL LV
PILLAR PROVIDED WILL SERVE:
- POWER TO EXTERNAL LIGHTING / CAR PARKING BAYS
- POWER TO FACILITATE ZONE A AND C

ELECTRICAL PILLAR-4
SIZE 1mW X 0.4mD X 1.2mH.
ALLOW 1.4m CLEAR SPACE IN FRONT OF PANEL LV
PILLAR PROVIDED WILL SERVE:
- POWER TO EXTERNAL LIGHTING / CAR PARKING BAYS
- POWER TO FACILITATE ZONE B, D1 AND E

ELECTRICAL PILLAR-1 (CHAPEL)
SIZE 1mW X 0.4mD X 1.2mH.
ALLOW 1.4m CLEAR SPACE IN FRONT OF PANEL LV
PILLAR PROVIDED WILL SERVE:
- POWER TO EXTERNAL LIGHTING / CAR PARKING BAYS
- POWER TO CHAPEL BUILDING

ELECTRICAL PILLAR-3 (CREMATORIUM)
SIZE 1mW X 0.4mD X 1.2mH.
ALLOW 1.4m CLEAR SPACE IN FRONT OF PANEL LV
PILLAR PROVIDED WILL SERVE:
- POWER TO EXTERNAL LIGHTING / CAR PARKING BAYS
- POWER TO CREMATORIUM BUILDING

ELECTRICAL PILLAR-2 (ADMINISTRATION)
SIZE 1mW X 0.4mD X 1.2mH.
ALLOW 1.4m CLEAR SPACE IN FRONT OF PANEL LV
PILLAR PROVIDED WILL SERVE:
- POWER TO EXTERNAL LIGHTING / CAR PARKING BAYS
- POWER TO ADMINISTRATION BUILDING

SITE MAIN SWITCHBOARD (MSB)
SIZE 2mW X 0.5mD X 2.1mH.
ALLOW 1.4m CLEAR SPACE IN FRONT OF MSB
MSB PROVIDED WILL SERVE:
- RETAILER METER AND CURRENT TRANSFORMER
- POWER TO CARE TAKER SWITCHBOARD
- POWER TO ELECTRICAL PILLARS 1 - 5
- ILLUMINATED SIGNAGE (IF ANY)

PAD MOUNT SUBSTATION
FOR ELECTRIC CREMATORIUM. REQUIREMENT OF PAD MOUNTED SUBSTATION (UP TO 1500kVA) EASEMENT ON SITE:
-SUBSTATION EASEMENT SIZE TO BE 2.75 X 5.5m.
-SUBSTATION EASEMENT TO BE OPEN TO SKY.
-SUBSTATION EASEMENT NEEDS TO BE FLUSH WITH THE FRONTAGE OF PROPERTY BOUNDARY
-EASEMENT MUST BE LOCATED AS SUCH THAT THE SUBSTATION CUBICLE IS 3m FROM THE NEIGHBOUR BOUNDARY.
-FIRE RATING OF ANY BUILDING STRUCTURE WITHIN THE FIRST 1.5m FROM THE SUBSTATION CUBICLE NEEDS TO BE 2HRS FIRE RATED AND IN THE FOLLOWING 1.5m TO 3m NEEDS TO BE 1hr FIRE RATED.
-ANY BUILDING STRUCTURE WITHIN 3m FROM THE SUBSTATION CUBICLE NEEDS TO BE BLAST RESISTANT.
-MINIMUM 6m CLEARANCE FROM SUBSTATION CUBICLE TO ANY OPENING/VENTILATION DUCT, OF OWNER OR NEIGHBOUR BUILDING, MUST BE MAINTAINED.
-SUBSTATION CUBICLE NEEDS TO BE AT LEAST 10M AWAY FROM ANY FIRE HYDRANT BOOSTER.
NOTE: IF A FIRE PUMP ROOM IS WITHIN 10m OF SUBSTATION, FIRE AUTHORITY APPROVAL MAY BE REQUIRED.
-NO UTILITIES, OTHER SERVICES OR ANY FOREIGN STRUCTURES ARE ALLOWED TO ENCRROACH THE SUBSTATION EASEMENT.
-COMPLY WITH 1:100 FLOOD LEVELS, FOR WHEREVER THE EASEMENT IS LOCATED.
-24/7 ACCESS TO THE SUBSTATION MUST BE PROVIDED WITH PARKING AT THE FRONTAGE OF THE SUBSTATION.

WATER METER ASSEMBLY
4.5m L x 0.75m W x 0.5m H

1500 FIRE HYDRANT PIPEWORK TO SERVE
HYDRANTS AS PER BUSH FIRE REPORT.

SEPTIC WASTEWATER HOLDING TANK
BELOW GROUND TRAFFICABLE SEPTIC WASTEWATER
HOLDING TANK WITH 900mm DIAMETER COVER.
NOMINAL 50,000 LITRE CAPACITY COMPLETE WITH
MID LEVEL AND HIGH LEVEL ALARM

SEPTIC TANK
5.0m DIAMETER BELOW GROUND SEPTIC TANK
WITH 1m x 1m x 1m BLOWER / FILTER BOX
ABOVE GROUND ON TOP OF THE TANK.
NOTE: BLOWER / FILTER BOX AND SEPTIC
TANK MUST BE LOCATED IN NON-TRAFFICABLE
AREA AND MUST BE PROTECTED FROM
VEHICLE DAMAGE.

BESTEC®
DOCUMENT ISSUE
Date
9 – May – 25
BESTEC
ABN 38 459 407 863
BUILDING ENGINEERING
SERVICES TECHNOLOGIES
CONSULTING ENGINEERS

PRELIMINARY

Issue	Amendments	Date	Init.
P1	PRELIMINARY ISSUE	09.05.25	CY

PRINT IN COLOUR
THIS NOTE IS
SHOWN IN RED

North

Architect

Design Cubicle Pty Ltd
Address: 44, Sand Street, North
Perth 6150 NSW
Tel: 08 9272 4701
Fax: 08 9272 4701
Email: info@designcubicle.com.au
Web: www.designcubicle.com.au
ABN: 47 116 316 333

BESTEC®

BESTEC
ABN 38 459 407 863
T: (03) 9272 4700
F: (03) 9272 4701
E: consulting@bestec.com.au
A: Suite 1, Level 13,
80 Collins Street, North Tower
Melbourne, 3000
Victoria
W: bestec.com.au

Project DOUGLAS PARK CEMETERY	Drawn CY	Checked	Date MAR 2025
Title HYDRAULIC SERVICES	Designed OJL	Checked	Scale 1:1000 @A1
HYDRAULIC AND ELECTRICAL SERVICES SPATIAL ARRANGEMENT	Project Number 30711	Drawing Number BSK01	Issue P1

Appendix G – Waste Water Management: Site and Soil Evaluation and Pump Out Disposal



SEEC

Wastewater Management: Site & Soil Evaluation & Pump-Out Disposal

**For Proposed Douglas Park Memorial Park –
Concept Plan and Stage 1**

Prepared by: Erin Probert

**Strategic Environmental and Engineering Consulting (SEEC) Pty Ltd
PO Box 1098, Bowral NSW 2576
Tel. 02 4862 1633
Email reception@seec.com.au
Web www.seec.com.au**

SEEC Reference: 24000316

13 May 2025



SEEC

Strategic Environmental and Engineering Consulting

PO Box 1098, Bowral, NSW, 2576
phone: (02) 4862 1633
email: reception@seec.com.au
www.seec.com.au

Project Reference: 24000316-WW-02

Date of Assessment: 13/05/2025

Signed:

Document Certification

This report has been developed based on agreed requirements as understood by SEEC at the time of investigation. It applies only to a specific task on the nominated lands. Other interpretations must not be made, including changes in scale or application to other projects. The contents of this report are based on a professional appraisal of the conditions that existed at the time of our investigation. Where subsurface investigations have been done the results are only applicable to the specific sampling or testing locations and only to the depth(s) investigated. Because of natural geological variability, and/or because of possible anthropogenic influences, the subsurface conditions reported can change abruptly. Such changes can also occur after the site investigation. The accuracy of the conditions provided in this report is limited by these possible variations and influences and/or is limited by budget constraints imposed by others and/or by adequate accessibility.

Copyright

The information, including the intellectual property contained in this document is confidential and proprietary to SEEC. It may be used only by the person, company or organization to whom it is provided for the stated purpose for which it is provided. It must not be given to any other person, company or organization without the prior written approval of a Director of SEEC. SEEC reserves all legal rights and remedies in relation to any infringement of its rights in respect of confidential information. © SEEC

Document Issue Table

Version	Date	Author	Reviewed	Notes
DRAFT 0A	03/09/2024	EP	JF/CLIENT	
FINAL 01	16/04/2025	EP	LO/CLIENT	
FINAL 02	13/05/2025	EP	CLIENT	



SEEC

Consultant Declaration

Project Details	
PROJECT NAME	
Application Number	SSD- 68287712
Address of subject land	430-490 Douglas Park Road, Douglas Park
Lot / DP	Lot 2 DP 250359.
APPLICANT DETAILS	
Applicant name	Benima Pty Ltd
Applicant address	
REPORT DETAILS	
Name of report this declaration relates	Wastewater Management: Site & Soil Evaluation & Pump-Out Disposal - For Proposed Douglas Park Memorial Park – Concept Plan and Stage 1
Report reference no.	24000316-WW-01
Report date	13/05/2025
Company name (inc. ABN / ACN)	Strategic Environmental and Engineering Consulting (SEEC) Pty Ltd ABN: 97 155 426 289
Author name	E. Probert
Author qualifications	B. Env. Sci. &Mgt
Author address	PO Box 1098, Bowral, NSW, 2576
DECLARATION BY CONSULTANT	
Name	Erin Probert
Registration No.	N/A
Organisation registered with	N/A
Declaration	The undersigned declares that Wastewater Management: Site & Soil Evaluation & Disposal System Design 1: - Has been prepared in accordance with the following policy, guidelines, or legislative requirements: - AS/NZS 1547: 2012 On-site Domestic Wastewater Management (Standards Australia / Standards New Zealand, 2012). - Environment and Health Protection Guidelines: Onsite Sewage Management for Single Households (Department of Local Government, 1998). - WaterNSW (2023). Designing and Installing On-Site Wastewater Systems. A WaterNSW Current Recommended Practice. - Wollondilly Shire Council (2021) On-Site Sewage Management and Greywater Re-Use Policy. - Contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the Wastewater Management: Site &

	Soil Evaluation & Disposal System Design relates; • does not contain information that is false or misleading; • identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project; • identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the Wastewater Management: Site & Soil Evaluation & Disposal System Design relates; • contains a consolidated summary of the proposed or necessary mitigation measures
Signature	
Date	13/05/2025

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	SEARs Requirements.....	3
1.2	Agency Advice	3
2	SITE DETAILS	5
2.1	Site Description.....	5
2.1.1	Building Facilities and Operating Hours.....	5
2.1.2	Building Facilities Occupants	6
2.1.3	Cemetery Services	6
2.2	Design Wastewater Loading	6
3	REQUIREMENTS.....	1
3.1	Guideline and Reference Compliance.....	1
3.2	Referral Agency Advice	1
3.3	Proposed Wastewater Design	1
4	MONITORING PLAN.....	5
5	CONCLUSION	6
6	MITIGATION MEASURES.....	7
7	REFERENCES	8

1 INTRODUCTION

This Wastewater Site and Soil Assessment Report has been prepared by Strategic Environmental and Engineering Consulting (SEEC) on behalf of Benima Pty Ltd for a combined Concept Plan approval and Stage 1 detailed works for a new multi-denominational cemetery at 430-490 Douglas Park Drive, Douglas Park (Douglas Park Memorial Park - Concept Plan and Stage 1).

The site is located at 430-490 Douglas Park Drive, Douglas Park within the Wollondilly Local Government Area (LGA). The site is irregular in shape with a total size of 16,7940m². It is legally described as Lot 2 in DP 250359. The site is mostly vacant with scattered vegetation and a single, residential dwelling with driveway accessible from Douglas Park Drive. The site comprises two street frontages, to the east is Mitchell Place and to the west is Douglas Park Drive.

This report accompanies a State Significant Development Application that seeks approval for a combined Concept Plan approval and Stage 1 detailed works for a new multi-denominational cemetery.

Concept approval is sought for the use and operation of the site as a cemetery with a maximum, staged capacity of up to 37,107 burial plots including a crematorium, chapel, administration building, vaults, remembrance sanctuaries, general site layout and all associated groundworks, roads, parking, pathways, landscaping and ancillary buildings. Refer to Figure 1.

The Stage 1 works comprise the following (refer to Figure 2):

- All preparatory site works including vegetation protection, enhancement and removal, demolition of existing structures, bulk excavation for burial zones, general ground works and utility service augmentation;
- Vehicular access / egress from Douglas Park Drive with separate vehicular egress only to Mitchell Place;
- Construction of internal roads, pathways and parking areas for approximately 118 car parking spaces inclusive of 1 hearse car parking space;
- Perimeter memorial pedestrian pathway with remembrance sanctuaries;
- Burial zones with a maximum capacity of 15,447 comprising shallow, single and triple layered burial plots;
- Construction of single storey chapel, single storey administration building and single storey storage shed and garage;
- Site landscaping, fencing, lighting and entry signage; and
- The cemetery operating hours, including public access, will be between the hours of 6:00am and 6:00pm, 7 days a week. The opening hours of the Chapel and Administration Building (including café) will be between 8:00am and 5:00pm, 7 days a week.

The burial zone preparation works within Stage 1 will be carried out sequentially within each burial zone and will be based on the demand for burial plots.

For a detailed project description refer to the Environmental Impact Statement prepared by Ethos Urban.



Figure 1 - Concept Site Plan. Source: Arcadia Landscape Architecture.



Figure 2 - Extent of Stage 1 Works. Source: Arcadia Landscape Architecture.

1.1 SEARs Requirements

Table 1-1 details each of the relevant requirements stated within the Planning Secretary's Environmental Assessment Requirements (SEARs) and the relevant section of the report that addresses them.

Table 1-1: SEARs Requirements

Item	SEARs Requirements	Relevant Report Section
Issues and Assessment Requirements – Concept Proposal		
17	Provide an overarching Integrated Water Management Plan for the Concept Proposal that: - is prepared in consultation with the local council and any other relevant drainage or water authority. - includes the overall proposed concept drainage design (stormwater and wastewater) for the site including any on-site treatment, reuse and detention facilities, water quality measures, and the nominated discharge points.	See Sections 3.2, 3.3 & 5
	Provide details that demonstrate satisfactory arrangements for drinking water, wastewater, and recycled water (if required).	See Section: 3.3 & 5
	Demonstrate that the development does not adversely impact on any existing water, wastewater or stormwater main, or other Sydney Water asset, including any easement or property.	See Section 3.3
Issue and Assessment Requirements – Stage 1		
15	Provide an Integrated Water Management Plan for development that: - details the proposed drainage design (stormwater and wastewater) for the site including any on-site treatment, reuse and detention facilities, water quality management measures and nominated discharge points. - demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse downstream impacts.	See Sections 3.2 & 3.3

1.2 Agency Advice

outlines the details of the specific agency advice in relation to wastewater management.

Table 1-2 - Referral Authority Requirements

Referral Authority	Consultation Requirement	Relevant Report Section
Wollondilly Shire Council	Details of wastewater management - It is noted that the site is not currently serviced by Sydney Water sewer infrastructure. Any proposed development is to include a detailed wastewater report. The report is to consider all activities on the site and the	See Sections 2.1.1, 2.1.2, 2.2, 3.2 & 3.3

	maximum usage of the site. Accompanying site plans shall demonstrate potential buildings and uses, and consider any events which may occur at the site, effluent distribution zones and all required buffer distances. Demonstrate compliance with the National Water Quality Management Strategy Australian Guidelines for Water Recycling: Managing Health and Environmental Risks.	
--	---	--

2 SITE DETAILS

Table 2-1 Site details.

Site Address	Lot 2 DP 250359 No. 430 – 490 Douglas Park Drive, Douglas Park
GPS Reading	N: 6213366.255, E: 289040.427
Allotment Size	16.71 ha (approx.)
Proposed Development	New multi-denominational cemetery including administration building with café, chapel, storage shed/garage and crematorium.
Water Supply	Tank
Number of people	• Administration: estimated 5 full-time staff with Café serviced by 2 full-time staff and with capacity allowance of 50 customers. • Chapel: estimated 2 full-time staff and estimated 200 visitors per day • Crematorium Building: estimated capacity of 80 visitors per day with estimated 2 full-time staff • Storage Shed / Garage: estimated a maximum of 2 full-time staff.
Local Government Authority	Wollondilly Shire

2.1 Site Description

Lot 2 DP 250359 is a 16.71 ha (approx.) rural lot located on the north-eastern side of Douglas Park Drive. The site is currently occupied by a residential dwelling and tennis court within the central-southern portion.

The proposed cemetery structures include an administration building with cafe, chapel, and crematorium to be located along the central-southwestern boundary of the site, and a storage shed/garage to be located in the southern corner of the site.

2.1.1 Building Facilities and Operating Hours

The facilities are expected to conduct the following operating hours:

- The cemetery and parklands will be open from Sunrise to Sunset (6am – 7pm), seven (7) days a week;
- The Administration building is expected to be open 8am – 5pm , seven (7) days a week;
- The Café and Flower Shop is expected to be open 8am – 5pm , seven (7) days a week;
- The Chapel is expected to be operating between 8am – 5pm , seven (7) days a week (unless booked for private services); and
- The Crematoria (Cremations) is expected to be operating between 10am – 4pm , Monday to Friday (TBC in Future Development Applications).

2.1.2 Building Facilities Occupants

The following table outlines the estimated average occupants of the proposed development:

Building	Estimated Average Occupants / Day	Estimated Average Visitors / Day	Total Average Occupants / Day
Administration	5	10	15
Café / Flower Shop	2	50	52
Chapel	2	200 (per service)	402
Storage Shed / Garage	2	0	2
Crematorium (Concept)	2	80 (per service)	162

2.1.3 Cemetery Services

The following estimations and assumptions of the cemetery services have been included in the calculations herein:

- All buildings will be staffed between 6 am and 7pm daily;
- Cremation services will operate between 10 am and 4 pm, Monday to Sunday, seven (7) days per week;
- Burials will take place between 10 am and 4 pm, seven (7) days per week;
- Chapel and Burial services are estimated to last 30 minutes to 90 minutes, varying by cultural and religious customs (additional time can be booked in advance if required);
- Estimated average of two (2) Crematorium services per day; and
- Estimated average of two (2) Chapel services per day.

2.2 Design Wastewater Loading

NSW Health (2001) *Septic Tank and Collection Well Accreditation Guideline* gives a daily flow (litres/person/day) for commercial premises. Wastewater design flows adopted are outlined in Table 2.

Table 2-2 Design wastewater loading calculations (NSW Health, 2001)

Type of Premises	Wastes	Typical wastewater design flows (L/person/day)
Factories and Offices	WC, basin, shower, kitchen (staff)	41
Restaurant	WC, urinal basin, kitchen (staff)	28
	WC, urinal, basin (visitors)	12
Theatres and Public Halls	WC, urinal, basin (visitors)	2

It should be noted that the typical wastewater design flow for 'Theatres and Public Halls' has been used to calculate design wastewater loading for visitors attending services and

attending the administration building at the proposed development due to the limited service timing (between 30 minutes and 90 minutes) and nature of premise attendance.

Therefore, the Design Wastewater Loading Rates have been calculated in accordance with NSW Health (2001), as shown below:

Building	Estimated Wastewater Loading (Staff) (L/day)	Estimated Wastewater Loading (Visitors) (L/day)	Total Wastewater Loading (L / day)
Administration	5 persons x 41 L = 205 L/ day	10 persons x 2 L = 20 L/ day	225 L/ day
Café / Flower Shop	2 persons x 28 L = 56 L/ day	50 persons x 12 L = 600 L/ day	656 L/ day + 775 L/ day (dishwashing allowance*) + 15.45 L/ day (kitchen floor washdown allowance**)
Chapel	2 persons x 41 L = 82 L/ day	200 persons x 2 L/ day x 2 services / day = 800 L/ day	882 L/ day
Storage Shed / Garage	2 persons x 41 L = 82 L/ day	-	82 L/ day
Crematorium (Concept)	2 persons x 41 L = 82 L/ day	80 persons x 2 L/ day x 2 services per day = 320 L/ day	402 L/ day
Total Design Wastewater Allowance:			3,037.45 L/ day

*Dishwashing allowance based on 1,550 L/100 persons (licensed clubs, NSW Health, 2001).

** Kitchen floor washdown allowance of 2.48 L per square metre of café footprint.

3 REQUIREMENTS

This wastewater management report has been prepared in accordance with the following guidelines and references:

- National Water Quality Management Strategy (2006). Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1);
- AS/NZS1547:2012 On-site Domestic Wastewater Management
- NSW Health (2001). Septic Tank and Collection Well Accreditation Guideline.

3.1 Guideline and Reference Compliance

The wastewater management outlined in this report has been proposed to minimise the public and ecological exposure and exposure to receiving environments of potential hazards of treated effluent by installing a pump-out system to dispose of treated effluent off-site.

3.2 Referral Agency Advice

SEEC contacted Mark Griffiths, Environmental Health Officer of Wollondilly Shire Council on Tuesday 11th March 2025 via email correspondence to confirm appropriate wastewater management advice. Advice was given by Wollondilly Shire Council that *“Any proposed pump-out system in an unsewered area in Wollondilly Shire requires a septic tank located upstream of the collection well to collect sludge and provide primary treatment of the effluent”*. SEEC have therefore proposed the following wastewater design outlined in Section 3.3.

3.3 Proposed Wastewater Design

Wastewater would be gravity-drained into an approved septic tank and a collection well with the minimum volumes below. Both tanks would be anchored to minimise the risk of uplift.

The septic tank (or chamber) must be fitted with an outlet filter and have a minimum capacity of 4,587.45 L (3,037.45 L/day + 1,550 L sludge allowance) to allow for approximately 24-hour settling volume. SEEC recommends that a septic tank of at least 6,000 L be installed. The septic tank must be baffled to provide two chambers where the capacity of the first chamber is twice the capacity of the second chamber.

The septic tank (or chamber) would overflow into a collection well. The collection well must have a minimum capacity 30,375 L = (3,037.45 L x 10 days). This allows for a weekly pump-out with a factor of safety. However, we recommend installing a collection well with a capacity of 50,000 L to allow for an approximate fortnightly (14 day) pump-out.

The collection well must be fitted with a pump line that reaches from the tank to the pump-out point. The pump-out point must comprise of a pump-out stand which is concreted to the ground or lid of the collection well and fitted with a “camlock” (or similar) cover which can be easily accessed by a pump-out tanker. The location of the pump-out point will be determined in consultation with the liquid waste contractor to ensure safe access. SEEC have shown an indicative location on Figure 3.

The wastewater management infrastructure must be fitted with warning signs. The signs shall read "WARNING: RECLAIMED EFFLUENT/RECYCLED WATER, DO NOT DRINK, AVOID CONTACT" or similar. Lettering must be clearly visible from three meters away.

SEEC recommend installing full water reduction plumbing fixtures throughout the proposed development to minimise wastewater generation on this site. Full water reduction fixtures include 3/6 litre dual flush toilets, shower flow restrictors, aerator taps, front load washing machines, and flow/pressure control valves on all water use outlets.

Liquid detergents must be used in the facilities as powders contain elevated concentrations of salt which could alter the soil's chemistry and reduce its ability to percolate water. All cleaning products must be "Septic Friendly".

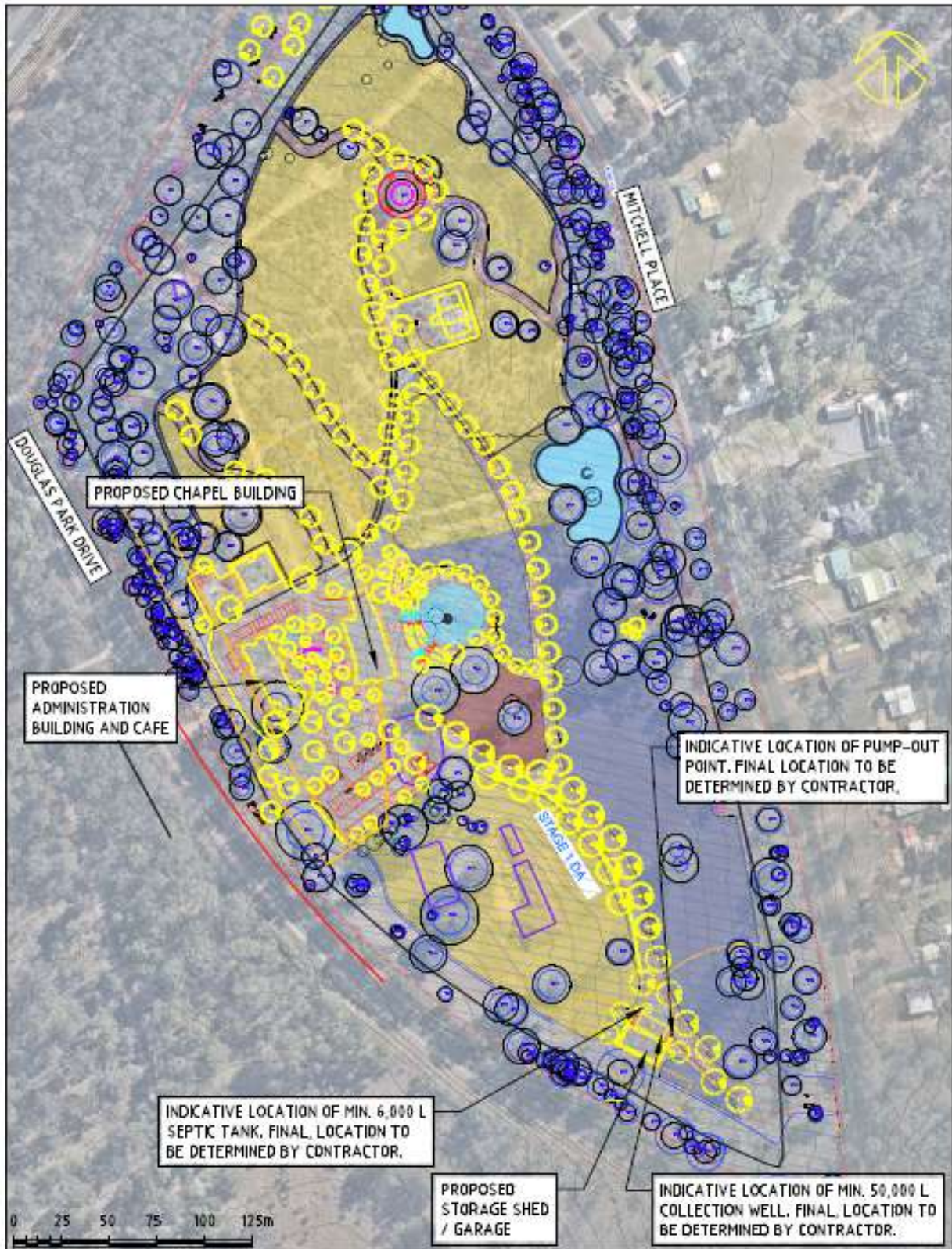


Figure 3 - Site Plan

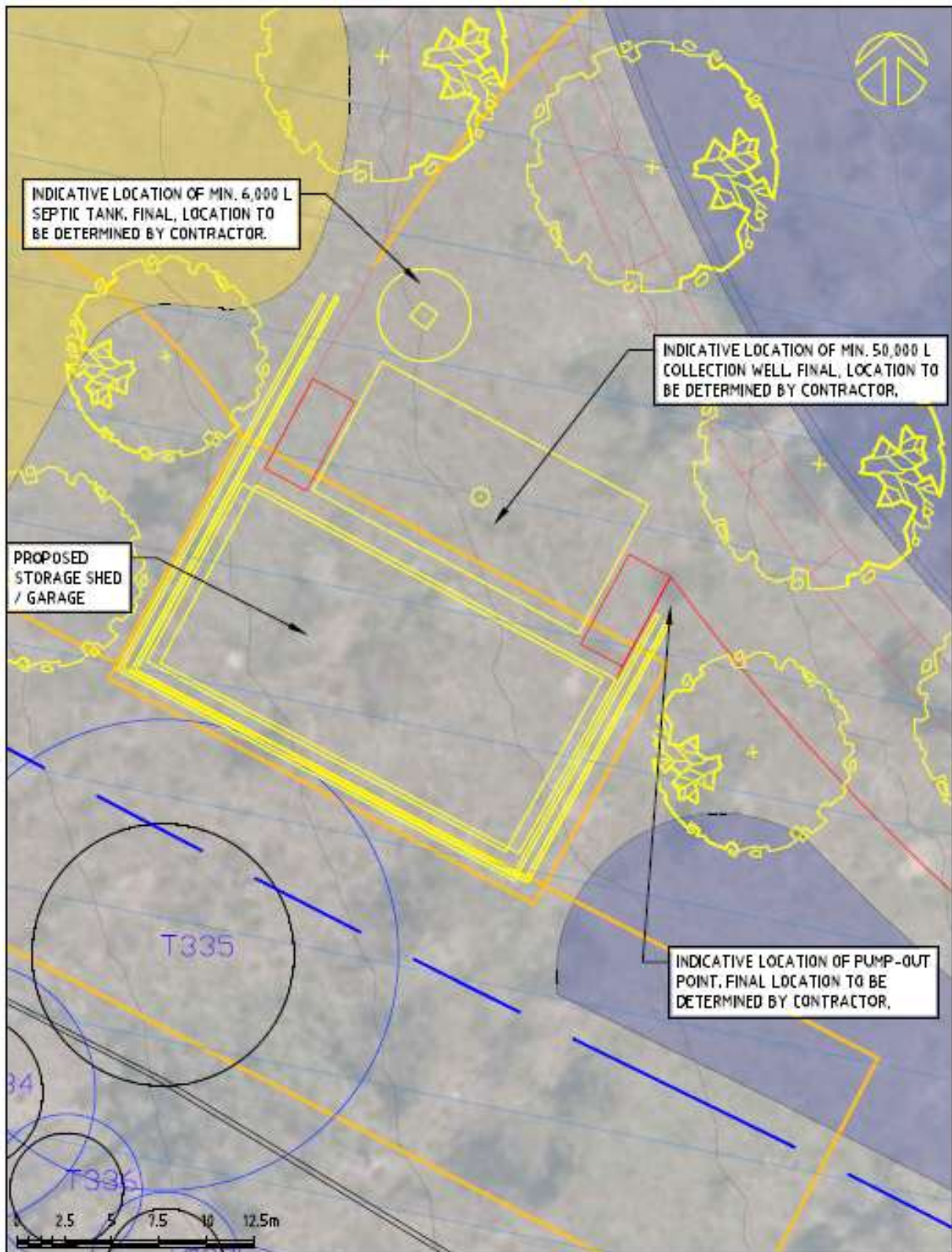


Figure 4 - Site Plan - Wastewater Infrastructure

4 MONITORING PLAN

As in accordance with the required advice provide by Wollondilly Shire Council letter titled Secretary's Environmental Assessment Requirements – 430-490 Douglas Park Drive, Douglas Park (Lot 2 DP 250359) (Ref. CM 14798: mb, dated 26 March 2024), the following monitoring plan is outlined below.

The collection well has been sized for a fortnightly pump-out. However, if water saving practices are implemented by the facility management, a fortnightly pump-out may not be required. Therefore, the collection well must be fitted with a high-level alarm set at 80% capacity, positioned in a prominent place (e.g. the storage shed/ garage). The maintenance personnel must contact the pump-out contractor immediately if it is activated. Pump-out records will be kept by the Facility Manager (or nominated personnel) and might need to be submitted to Council to prove compliance. The septic tank must be de-sludged every three to five years depending on sludge build-up. The outlet filter will require periodic (quarterly) cleaning.

5 CONCLUSION

We conclude the site is suited to remove primary-treated effluent by a liquid waste contractor. Specifically, our recommendations are:

1. To install 6,000 L (minimum) septic tank to primary-treat all wastewater generated by the proposed development. If not already done so, the septic tank must be fitted with an outlet filter and must be baffled;
2. To install a collection well with a minimum capacity of 50,000 L to collect all primary-treated effluent from the septic tank;
3. To install a pump-line connected to a pump-out point on this site to allow for easy tanker access to the wastewater management infrastructure;
4. To install a high-water alarm in the collection well at 80% capacity, positioned in a prominent place (e.g. the storage shed/garage) to alert the management that a pump-out is required;
5. To install full water reduction fixtures in the proposed structures to reduce wastewater loads;
6. To ensure that no other structures (existing or planned) are connected to the proposed pump-out system unless the proper approval is granted;
7. To erect Warning Signs on the wastewater management infrastructure. Refer to Section 4;
8. To keep a record of all pump-outs. Records may be required by Council;
9. To only use septic friendly cleaning products to maintain optimal functioning of the septic tank;
10. To install and manage the wastewater system according to the details of this report, its appendices and the manufacturer's recommendations; and

6 MITIGATION MEASURES

In accordance with SEARs requirements, mitigation measures are outlined in Table 6-1 below.

Table 6-1: Mitigation Measures

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of Report
D/O	Install full water reduction plumbing fixtures throughout the proposed development.	Section 3
O	Collection well must be fitted with a high-level alarm set at 80% capacity.	Section 4.1
D/C	Collection well pump-out point must comprise of a pump-out stand (concreted to the ground and fitted with a “camlock” (or similar) cover which can be easily accessed by a pump-out tanker.	Section 3

7 REFERENCES

Department of Local Government (1998). Environment and Health Protection Guidelines: *Onsite Sewage Management for Single Household*.

NSW Health Department (2001). *Septic Tank and Collection Well Accreditation Guideline*

Standards Australia / Standards New Zealand (2012). AS/NZS 1547:2012 *On-site Domestic Wastewater Management*

Wollondilly Shire Council (2021). *On-site Sewage Management and Greywater Re-use plan*.

Wollondilly Shire Council (2024). *Secretary's Environmental Assessment Requirements – 430-490 Douglas Park Drive, Douglas Park (Lot 2 Dp 250359)*. Dated 26 March 2024. Ref: CM 14798 :mb.

NSW Government Department of Climate Change, Energy, the Environment and Water (2024). *SEARs - Douglas Park Cemetery - Concept Plan and Stage 1 (SSD-68287712)*. Dated 19 March 2024. Ref: DOC24/189352.

Appendix H – Sydney Water Correspondence

Building plan assessment application

Application number: 1902543

Property address: 432-490 Douglas Park Dr, Douglas Park 2569

Lot details: Lot 2, Deposited Plan 250359

04/06/2024

Dear Ondrej Labaj

Your building plan assessment application has been

APPROVED

This Approval is provided subject to the Conditions and Important Information issued to you by Sydney Water, which you are taken to have accepted by using the approval.

This Approval is based on the information you provided to us through Sydney Water Tap in.

If any of the information you have provided is incorrect or incomplete, Sydney Water may revoke this Approval.

This approval is valid until 04/06/2025 (one year).

ANY QUESTIONS?

Email us

swtapin@sydneywater.com.au

Call us

1300 082 746

STRUCTURES

The structures and information you supplied are displayed below.

Structure(s) that will not impact Sydney Water infrastructure

Structure 1	cemetery buildings	35.0 m x 25.0 m x 1.0 m
-------------	--------------------	-------------------------

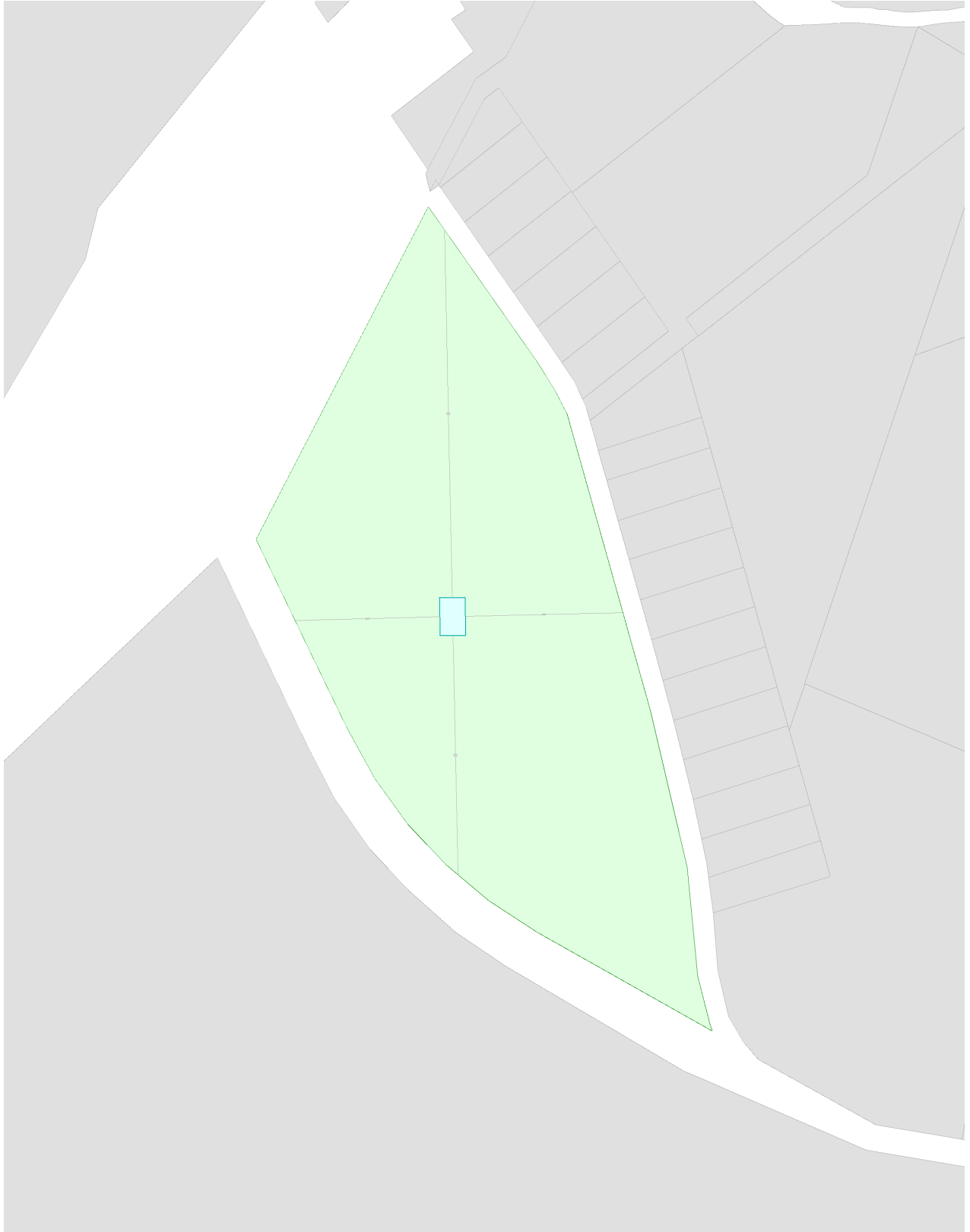
Structure 1 of 1: cemetery buildings

Application number: 1902543

Property address: 432-490 Douglas Park Dr, Douglas Park 2569

Lot details: Lot 2, Deposited Plan 250359

This structure will not impact Sydney Water infrastructure.



CONDITIONS AND IMPORTANT INFORMATION

Conditions and Important Information

Attention: You must read the information below.

- 1 The approval of your building plan by Sydney Water (Approval) has been generated by an automated system based on the information you have provided to Sydney Water through the Sydney Water Tap in. Sydney Water does not make any representation or give any guarantee, warranty or undertaking (express or implied) as to the currency, accuracy, completeness, effectiveness or reliability of the Approval.
- 2 It is your responsibility to ensure that the information is correct and complete when submitting your building plan for approval through Sydney Water Tap in and, if any of the information is incorrect or incomplete, to resubmit information that is correct and complete. If any of the information that you have provided is incorrect or incomplete, this may result in the revocation of the Approval.
- 3 The Approval is provided on each of the following conditions which you are taken to have accepted by using the Approval. To the fullest extent permitted by law:
 - (a) all conditions and guarantees concerning the Approval (whether as to quality, outcome, fitness, care, skill or otherwise) expressed or implied by statute, common law, equity, trade, custom or usage or otherwise are expressly excluded and to the extent that those statutory guarantees cannot be excluded, the liability of Sydney Water to you is limited to either of the following as nominated by Sydney Water in its discretion, which you agree is your only remedy:
 - i. the supplying of the Approval again; or
 - ii. payment of the cost of having the Approval supplied again;
 - (b) in no event will Sydney Water be liable for, and you release Sydney Water from all Losses arising out of or in connection with you providing incorrect or incomplete information to Sydney Water in connection with the Approval:
 - i. whether arising under statute or in contract, tort or any other legal doctrine, including any negligent act, omission or default (including wilful default) by Sydney Water; and
 - ii. regardless of whether Sydney Water is or ought to have been aware of, or advised of, the possibility of such loss, costs or damages;
 - (c) you will indemnify, defend and hold harmless Sydney Water from and against all Losses of Sydney Water in respect of, or in connection with loss or damage to any property, personal injury (including death or illness of any person), arising out of or in connection with:
 - i. you providing incorrect or incomplete information to Sydney Water in connection with the Approval; or
 - ii. any third party claim against Sydney Water; and
 - (d) you assume all risks associated with the use of the Sydney Water Tap in and Sydney Water websites, including risk to your computer, software or data being damaged by any virus, and you release and discharge Sydney Water from all Losses which might arise in respect of your use of the websites.

- 4 Subject to condition numbered 3(c) in this document, your liability under condition numbered 3(c) in this document is reduced to the extent that the loss, liability, expense or damage:
- (a) is caused solely and directly by any negligent act or omission of Sydney Water; or
 - (b) could not reasonably be foreseen and was not reasonably within the contemplation of you and Sydney Water at the time of the loss, liability, expense or damage.
- 5 The position of the proposed building/building works in relation to Sydney Water's pipes and structures is satisfactory. You are responsible for, amongst other things:
- (a) protecting underground structures, including Sydney Water's pipelines, from damage and interference;
 - (b) maintaining minimum clearances between Sydney Water's structures and structures belonging to others;
 - (c) preventing loss or damage to any property, personal injury (including death or illness of any person) arising out of or in connection with you providing incorrect or incomplete information to Sydney Water in connection with the Approval;
 - (d) repairing or making good loss or damage to any property or the environment arising out of or in connection with you providing incorrect or incomplete information to Sydney Water in connection with the Approval;
 - (e) ensuring that connections to Sydney Water's sewer, watermain or stormwater are only be made following the issue of a permit to a licensed plumber/drainer;
 - (f) ensuring that all proposed fittings will drain to Sydney Water's sewer;
 - (g) ensuring that all plumbing and/or drainage Work is to be carried out in accordance with the NSW Code of Practice, AS 3500 and the Sydney Water Act 1994;
 - (h) ensuring that gullies, inspection shafts and boundary traps are not placed under any roof, balcony, verandah, floor or other cover unless otherwise approved by Sydney Water; and
 - (i) notifying Sydney Water immediately of any damage caused or threat of damage to Sydney Water's structures.
- 6 **"Sydney Water"** means Sydney Water Corporation and its employees, agents, representatives and contractors. References to "you" include references to your employees, agents, representatives, contractors, executors, administrators, successors, substitutes, assigns and anyone else using the Approval. References to "Losses" means all liabilities, losses, damages, expenses, compensations, fines, penalties, charges and costs (including legal costs on a full indemnity basis and whether incurred or awarded) of any kind or nature however they arise and whether they are present or future, fixed or unascertained, actual or contingent and including any loss of profits, loss of revenue or loss of opportunity. To the extent of any inconsistency, the conditions numbered 1 to 6 in this document will prevail over any other information provided or made available to you by Sydney Water.

In an emergency, or to notify Sydney Water of damage or threats to its structures, call 13 20 92 (24 hours, 7 days).

Statement of Available Pressure and Flow

Ondrej Labaj
175 Flinders Lane
Melbourne, 3000

Attention: Ondrej Labaj

Date: 12/06/2024

Pressure & Flow Application Number: 1902519

Your Pressure Inquiry Dated: 2024-06-04

Property Address: 432-490 Douglas Park Drive, Douglas Park 2569

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Mitchell Place	Side of Street: East
Distance & Direction from Nearest Cross Street	400 metres North from Douglas Park Drive
Approximate Ground Level (AHD):	135 metres
Nominal Size of Water Main (DN):	200 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	155 metre head
Minimum Pressure	59 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	59
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	2 15	61 57
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	4	58
Maximum Permissible Flow	15	51

(Please refer to reverse side for Notes)

For any further inquiries regarding this application please email :

hydraulicassessment@sydneywater.com.au

General Notes

This report is provided on the understanding that (i) the applicant has fully and correctly supplied the information necessary to produce and deliver the report and (ii) the following information is to be read and understood in conjunction with the results provided.

1. Under its Act and Operating Licence, Sydney Water is not required to design the water supply specifically for fire fighting. The applicant is therefore required to ensure that the actual performance of a fire fighting system, drawing water from the supply, satisfies the fire fighting requirements.
2. Due to short-term unavoidable operational incidents, such as main breaks, the regular supply and pressure may not be available all of the time.
3. To improve supply and/or water quality in the water supply system, limited areas are occasionally removed from the primary water supply zone and put onto another zone for short periods or even indefinitely. This could affect the supply pressures and flows given in this letter. This ongoing possibility of supply zone changes etc, means that the validity of this report is limited to one (1) year from the date of issue. It is the property owner's responsibility to periodically reassess the capability of the hydraulic systems of the building to determine whether they continue to meet their original design requirements.
4. Sydney Water will provide a pressure report to applicants regardless of whether there is or will be an approved connection. Apparent suitable pressures are not in any way an indication that a connection would be approved without developer funded improvements to the water supply system. These improvements are implemented under the Sydney Water 'Urban Development Process'.
5. Pumps that are to be directly connected to the water supply require approval of both the pump and the connection. Applications are to be lodged online via Sydney Water Tap in™ system - Sydney Water Website – www.sydneywater.com.au/tapin/index.htm. Where possible, on-site recycling tanks are recommended for pump testing to reduce water waste and allow higher pump test rates.
6. Periodic testing of boosted fire fighting installations is a requirement of the Australian Standards. To avoid the risk of a possible 'breach' of the Operating Licence, flows generated during testing of fire fighting installations are to be limited so that the pressure in Sydney Water's System is not reduced below 15 metres. Pumps that can cause a breach of the Operating Licence anywhere in the supply zone during testing will not be approved. This requirement should be carefully considered for installed pumps that can be tested to 150% of rated flow.

Notes on Models

1. Calibrated computer models are used to simulate maximum demand conditions experienced in each supply zone. Results have not been determined by customised field measurement and testing at the particular location of the application.
2. Regular updates of the models are conducted to account for issues such as urban consolidation, demand management or zone change.
3. Demand factors are selected to suit the type of fire-fighting installation. Factor 1 indicates pressures due to system demands as required under Australian Standards for fire hydrant installations. Factor 2 indicates pressures due to peak system demands.
4. When fire-fighting flows are included in the report, they are added to the applicable demand factor at the nominated location during a customised model run for a single fire. If adjacent properties become involved with a coincident fire, the pressures quoted may be substantially reduced.
5. Modelling of the requested fire fighting flows may indicate that local system capacity is exceeded and that negative pressures may occur in the supply system. Due to the risk of water contamination and the endangering of public health, Sydney Water reserves the right to refuse or limit the amount of flow requested in the report and, as a consequence, limit the size of connection and/or pump.
6. The pressures indicated by the modelling, at the specified location, are provided without consideration of pressure losses due to the connection method to Sydney Water's mains.

Application for order #SW-04328417

Drinking water connection

Application: 2099190

 **We need some more information to progress the assessment of your application**

See message 28/03/25 Shane Davenport

Documents

Date	21-03-2025
File name	<u>30711 BSK01 - HYDRAULIC AND ELECTRICAL SERVICES SPATIAL ARRANGEMENT.pdf (../getDocument/1926493).</u>
Description	Site Plan
Uploaded by	Customer

Messages

Reply

Sydney Water: Shane Davenport

28-03-2025 12:15

Hi Ondrej

I'll need a case number from either Dveloper Direct or an extenal WSC before I can approve the connection.

Please message me when you have a case number or application number.

Kind regards

Shane Davenport

Attachments (0)**Customer:** Ondrej Labaj

27-03-2025 14:25

Thanks Shane,

Noted that we will need to apply for a section 73.

We will be making application direct rather than using the services of a water servicing co-ordinator.

To make the section 73 application we require a Development Approval, however to get a Development Approval we need confirmation from Sydney Water that the site is able to be serviced.

Is it possible for Sydney Water to provide a statement confirming that the site is able to be serviced then once the DA is in hand we will proceed with the section 73 application?

Thanks

Attachments (0)**Sydney Water:** Shane Davenport

26-03-2025 11:30

Hi Ondrej

A section 73 certificate will be required so we can raise the infrastructure contribution charges for the new connection and assess the hydraulic demands for the development. Please advise me when you have a case number.

Kind regards

Shane Davenport

Attachments (0)**Customer:** Ondrej Labaj

26-03-2025 10:52

Hi,

It was explained to me that given the relatively simple request that a water servicing co-

ordinator was not required.
Is this not the case?

Attachments (0)**Sydney Water:** Shane Davenport

26-03-2025 10:46

Hi Ondrej

I note that a development application (Section 73) for the proposed works has not been lodged through a Water Servicing Coordinator. This application must be lodged prior to the approval to the connection.

The developer can apply for this approval through any Water Servicing Coordinator. Please refer to the following link for a list of these Coordinators
www.sydneywater.com.au/plumbing-building-developing/provider-information/listed-providers/water-servicing-coordinators.html (<http://www.sydneywater.com.au/plumbing-building-developing/provider-information/listed-providers/water-servicing-coordinators.html>)

Once this application has been lodged, you can message the Case Number for the application to me so I can finalise the connection approval.

Kind regards

Shane Davenport
Development Services

Attachments (0)