Building Services Infrastructure Report

231262 GLENDENNING ROAD DATA CENTRE

Client:
LCI

Revision:
C

Date:
27/02/2025

REPORT INFORMATION

Project	Glendenning Road Data Centre
Title	Building Services Infrastructure Report
Client	LCI
Revision	C
Revision Date	27/02/2025
Prepared By	LCI Consultants Sydney Office Level 5, 73 Miller Street North Sydney, NSW 2060
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REVISION SCHEDULE

Revision	Date	Issue Name	Author	Authorised
A	20/09/2024	Draft for Comment	LCI	MF
B	13/11/2024	SSDA Submission	LCI	MF
C	27/02/2025	Issued for Public Exhibition – SSDA 73761707	LCI	MF

CONTENTS

1 Introduction

1.1 Purpose

This infrastructure report has been prepared on behalf of Lehr Consultants International (Australia) Pty Ltd (LCI) in support of a State Significant Development Application SSD **SSD-73761707** (SSDA) submitted to the Department of Planning, Housing and Infrastructure (DPHI) under Part 4 of the *Environmental Planning and Assessment Act 1979 (EP&A Act 1979).*

The proposed development is known as the Glendenning Road Data Centre and includes the construction and operation of three (3) data centre buildings and associated infrastructure.

The intent of this report is to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the SSDA (**SSD-73761707**) and will outline the electrical infrastructure requirements.

1.2 The Site

The subject site is located at 2 Glendenning Road, Glendenning and is legally described as Lot 2 DP 1137162. It is zoned E4 General Industrial under the *Blacktown Local Environmental Plan 2015.*

The subject site comprises a total area of 10.44ha and exhibits a primary frontage to Glendenning Road at the western boundary for approximately 295m. A secondary frontage to Woodstock Avenue is located along the southern boundary, for a length of approximately 335m.

The subject site comprises three (3) existing warehouse buildings that undertake various operations, including storage and logistics and a transport vehicle centre. The buildings are positioned toward the Glendenning Road frontage and cover approximately one half of the subject site. The remainder of the subject site to the rear is vacant and contains a mix of grass, native vegetation and sporadic trees. A patch of mature native vegetation exists along the southern boundary, which is identified as outstanding biodiversity value. An established landscaping strip is located along the Glendenning Road frontage, providing some screening of the existing buildings.

Vehicle access is obtained via four (4) vehicles crossings off Glendenning Road, which provide separate access for the two (2) large tenants. Vehicle access is also provided off Woodstock Avenue for the southern tenant.

The subject site is traversed by overhead 132kV transmission lines and towers, managed by Endeavour Energy. A drainage reserve also exists directly north of the subject site, which is managed by Blacktown City Council.

The subject site is surrounded by industrial land to the north, west and south (refer to the site context in Figure 2). Directly adjoining the subject site to the east is the Nurragingy Reserve, which falls under the jurisdiction of the Western Parklands. The Eastern Creek is located within the reserve and runs along the eastern boundary of the subject site. The closest residential area is located approximately 400m to the west of the subject site on the opposite side of the Westlink M7 Motorway.

The subject site is depicted in Figure 1 below.

Figure 1 Aerial Map of Subject Site (Source: NearMap, 2024)

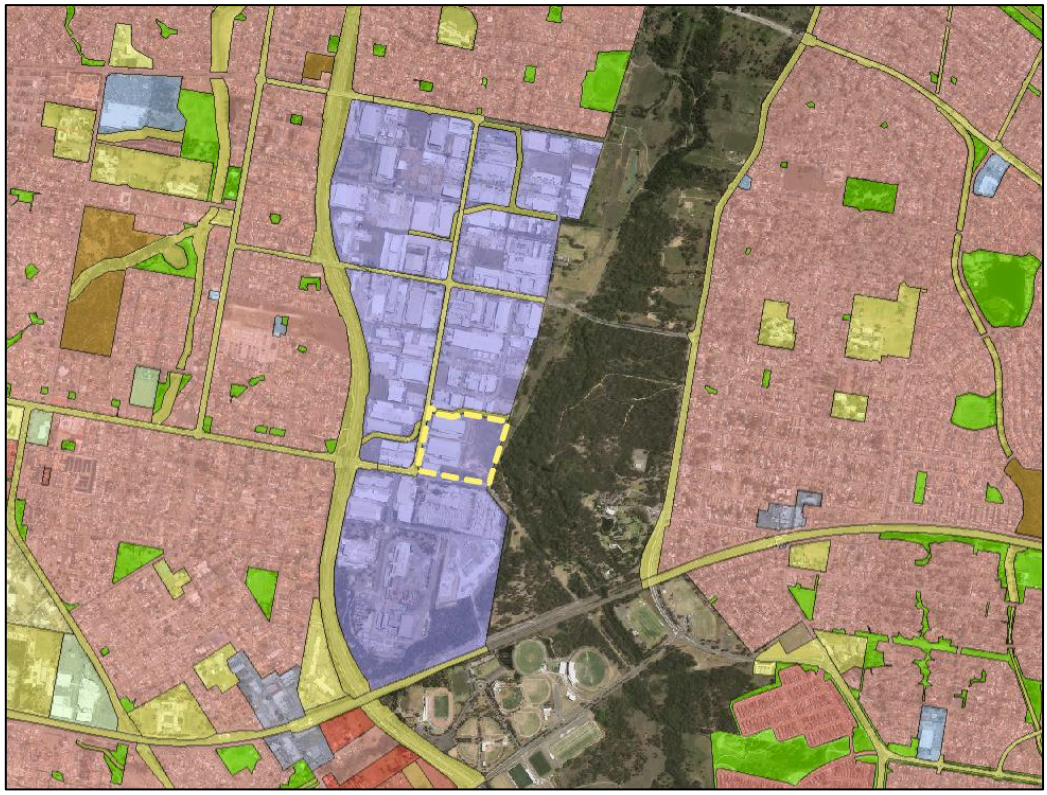


Figure 2 Site Context and Zoning (Source: Blacktown Local Environmental Plan, 2024)

1.3 Proposed Development

The proposed development is known as the Glendenning Road Data Centre and includes the construction and operation of three (3) data centre buildings and associated infrastructure, with a total power consumption of approximately 235MW.

The proposal involves the staged construction and operation of a data centre development, comprising:

- Site preparation and establishment works including:
  - Bulk earthworks to create proposed site levels;
  - In-ground building services and utility work;
  - Clearance of trees and vegetation within the proposed development extent;
- Construction and operation of three data centre buildings, known as DC01, DC02 and DC03, comprising:
  - A total Gross Floor Area (GFA) of 50,233m2 (DC01 – 19,985m2, DC02 – 10,263m2 and DC03 – 19,985m2);
  - A maximum building height of 45.3m, including five storeys for each building;
  - Three internal substations;
  - A total IT capacity of approximately 193.6MW (DC01 – 79.2MW, DC02 – 35.2MW and DC03 – 79.2MW);
- Total diesel fuel storage of 2,736,030L within underground bulk fuel storage tanks and generator day tanks;
- 97 back-up generators across the full development;
- External plant and equipment (including water tanks and pump rooms);
- Installation of evaporative cooling units;
- Three vehicle crossovers to Glendenning Road and internal access roads;
- Security fencing surrounding the development, including a controlled entry and exit point;
- 165 on-site car parking spaces (including 6 accessible parking spaces and 12 Electric Vehicle (EV) parking spaces);
- Landscaping across the subject site;
- Hours of operation being on a 24 hours per day, seven days per week basis.

The proposed works would be constructed in three stages, as follows:

- Stage 1: The first stage would include the construction of DC01, located at the rear of the subject site. The three existing site buildings would be demolished.
- Stage 2: The second stage would involve the construction of DC02.
- Stage 3: The construction of DC03.

1.4 SEARS Table Response

Project SEAR SSD 73761707	Section of report
Infrastructure Requirements and Utilites (SEARS #22) In consultation with relevant service providers:	
• Assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site.	2.1.2, 2.1.3, 2.2.2
• 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.	2.1.1, 2.1.6, 2.1.7, 2.2.3, 2.2.4, 2.3.1
• Provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be co-ordinated, funded and delivered to facilitate the development.	2.1.1, 2.1.5, 2.1.7, 2.2.3, 2.2.1, 2.3.1

Table 1 SEARS Infrastructure Requirements and Utilities

2 Infrastructure Requirements

2.1 Hydraulic and Fire Infrastructure Connections

2.1.1 Governing Authorities Requirements – Hydraulic and Fire Services

The water supply authority that will serve the site with both potable water and fire protection water is Sydney Water. The wastewater authority that will serve the site is also Sydney Water.

Sydney Water permits a single potable water supply and a single fire water supply connection for each site.

Sydney Water permits a single sewer connection for each site.

2.1.2 Existing Sewer Assets

An existing 400mm VC Sydney Water trunk sewer main is present on the northern side of the site. The trunk main is located approximately 2m inside the northern property boundary and there are two Sydney Water sewer manholes located within the property. This trunk main will be the sewer service that serves this development.

Refer to Figure 3 below for the map of the location of Sydney Water trunk sewer main.

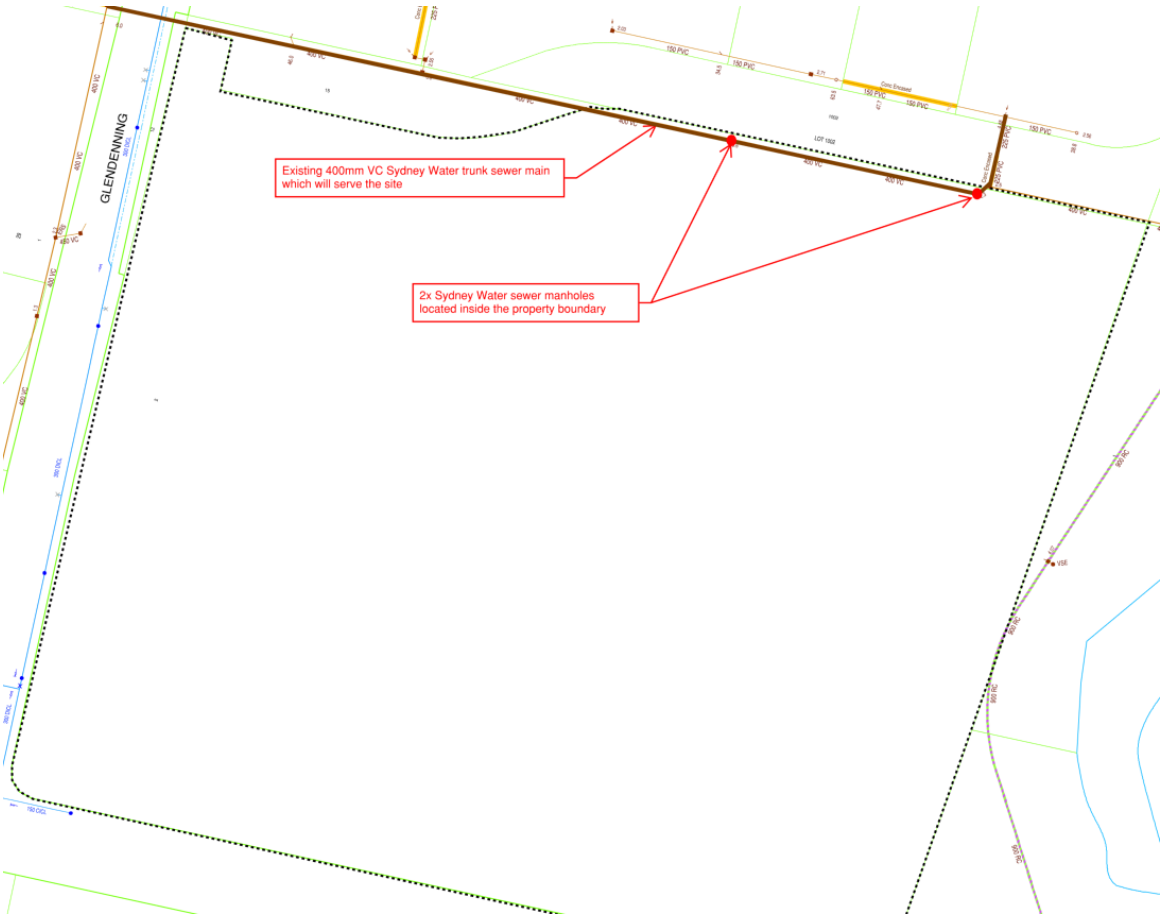


Figure 3 Sydney Water Before you Dig Australia (BYDA) Sewer Map

2.1.3 Existing Potable Water Assets

An existing 300mm DICL Sydney Water trunk water main is present on the nearside of Glendenning road outside the site. This trunk main will be the water service that serves this development.

Refer to Figure 4 below for the map of the location of Sydney Water trunk water main.

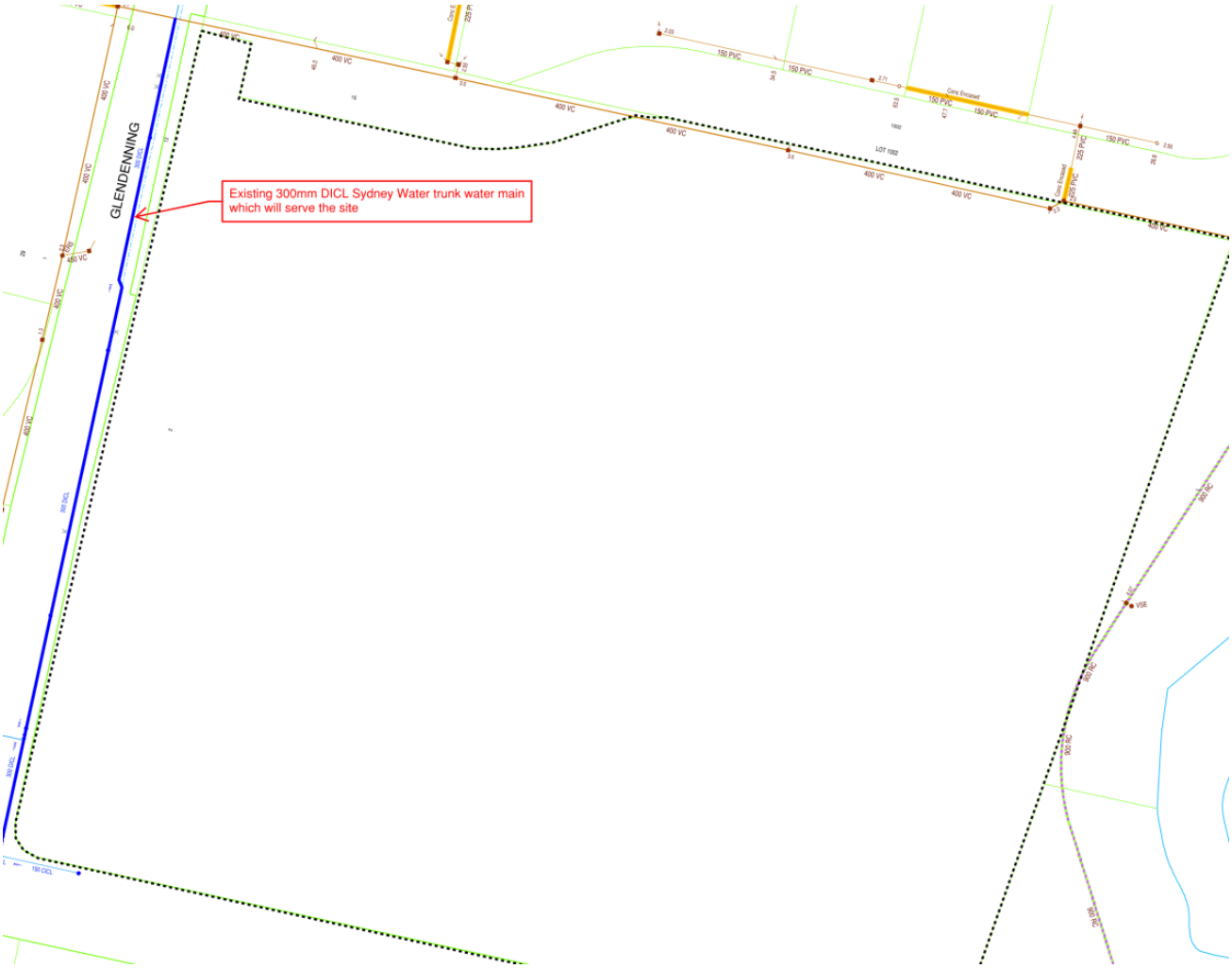


Figure 4 Sydney Water Before you Dig Australia (BYDA) Water Map

2.1.4 Potable Water Main Pressure & Flow Enquiry

A pressure and flow enquiry has been lodged to determine the available pressure in the Sydney Water trunk water main in Glendenning Road. The results of the enquiry indicated that at static flow conditions the water main would have a pressure of 59m of head and at a flow rate of 60 l/s the water main would have a pressure of 52 l/s.

From this pressure & flow enquiry, we can determine that the water main has sufficient pressure and flow to serve both the potable/industrial water and the fire water requirements of the site.

2.1.5 Sydney Water Applications

Feasibility Application

The Sydney Water Feasibility Application has been completed and a Feasibility Letter has been received from Sydney Water.

Please refer to Appendix 1 for the full Feasibility Letter.

The key results of the Feasibility Letter is that it is believed that the Sewer main will likely have sufficient capacity for the full development of the Water Main does not have capacity to supply the peak demands. The Feasibility Application included a peak demand which was significantly higher than what the development requires. Once the development consent is approved, a Section 73 Application will be submitted which will involve a more detailed analysis of the required peak demand of the site and the capacity of the Sydney Water Main.

Section 73 Application

The Section 73 Application has not been submitted at the time this report has been produced. The application will be submitted once the SSDA is approved. The results of the feasibility application will form the basis of the information and requirements of the Section 73 Application.

Building Plan Approval

The Building Plan Approval has not been submitted at the time this report has been produced. The application will be submitted once the SSDA is approved. The project is currently having a sewer peg-out survey conducted to form part of the building plan approval application.

2.1.6 Water and Sewer Demand Breakdown

A detailed breakdown of the water and sewer demands for the site at different stages of development has been completed for the project. The site is to have 3 separate Data Centres constructed and the water and sewer demand at each stage has been calculated and supplied to Sydney Water as part of the Feasibility Application.

Please refer to Table 2 below which details the water usage and sewer discharge rates at each stage. The usage and discharge is separated into domestic water usage which is water for amenities, irrigation and general cleaning and industrial water usage which is water which serves the evaporative cooling equipment within each data center. Each building shall have a rainwater harvesting system which supplements the sites potable water usage. These figures have been subtracted from the annual water usage to accurately represent the estimated potable water usage.

Stage	Usage	Instantaneous Peak Water Flow Rate (l/s)	Instantaneous Peak Sewer Flow Rate (l/s)	Peak Day Water Usage (l/day)	Peak Day Sewer Discharge (l/day)	Annual Water Usage (l/year)	Annual Sewer Discharge (l/year)
Stage 1 (2026)	Domestic Water Usage	0.84	0.50	2,000	1,600	730,000	584,000
	Industrial Water Usage	31.89	13.04	2,755,296	511,059	21,897,000	4,379,400
	Rainwater Supplementary Usage	N/A	N/A	N/A	N/A	2,542,000	N/A
	Total	**32.73**	**13.54**	**2,757,296**	**512,659**	**20,085,000**	**4,963,400**
Stage 2 (2028)	Domestic Water Usage	1.17	0.70	3,000	2,400	1,095,000	876,000
	Industrial Water Usage	46.04	18.79	3,990,000	798,000	31,531,680	6,306,336
	Rainwater Supplementary Usage	N/A	N/A	N/A	N/A	3,660,480	N/A
	Total	**47.21**	**19.49**	**3,993,000**	**800,400**	**28,966,200**	**7,182,336**
Stage 3 (2033)	Domestic Water Usage	1.52	0.91	5,000	4,000	1,825,500	1,460,000
	Industrial Water Usage	78.48	31.83	6,750,000	1,350,000	53,428,680	10,685,736
	Rainwater Supplementary Usage	N/A	N/A	N/A	N/A	6,202,480	N/A
	Total	**80.00**	**32.74**	**6,755,000**	**1,354,000**	**49,051,700**	**12,145,736**

Table 2 Water and Sewer Demand

Please note, fire water is not listed within the usage table above as usage of fire water is strictly reserved for in the event of a fire for sprinkler & fire hydrant use. The water supply for the fire protection systems shall be in accordance with NCC 2022, AS2118.1-2017, AS2118.6-2012 and AS2419.1-2021. Where NFPA 13 2022 are more stringent than the Australian standards, provisions for NFPA13 (2022) will apply. In addition, the evaluation of any water supply shall consider the anticipated peak concurrent domestic and industrial water demands for a fully constructed campus in accordance with the client's fire protection design guidelines.

A combined sprinkler and hydrant system shall be provided with two acceptable water supplies (dual supply), as per NCC 2022 for buildings with an effective height exceeding 25m. The system water supply for the wet fire protection services shall be sourced from two separate storage tanks (dual supply). The duration and the capacity of the storage tanks shall be the combination of the sprinkler system requirements and the fire hydrant system requirements.

The combined fire water demand for the site is 77.17 L/s as shown in Table 3. The authority water main can provide maximum flow of 120 L/s. However, the maximum flow rate available for the site is 60 l/s in accordance with the authority requirements. The 60 L/s from the authority main is not sufficient to provide the required flow rate for the fire water, therefore, a water storage tank shall be required.

SYSTEM	WATER DEMAND (L/s)
Fire Sprinkler System	47.17
Fire Hydrant System	30.0
Minimum Fire Water Demand	77.17

Table 3 Fire water demand

No upgrades are required to the water or sewer mains for the proposed works.

2.1.7 Proposed Water and Sewer Connections

Calculations have been completed to determine the suitable size of the new potable water connection and new sewer connection to the Sydney Water infrastructure. The calculations have been completed based on the peak flow rates detailed in Table 2.

It has been determined that that a 250mm potable water connection will be required to the Sydney Water trunk water main on the near side of Glendenning Road.

It has also been determined that a 225mm sewer connection will be required to the Sydney Water trunk sewer main on the northern side of the site.

Refer to Figure 5 below for proposed potable water and sewer connection locations.

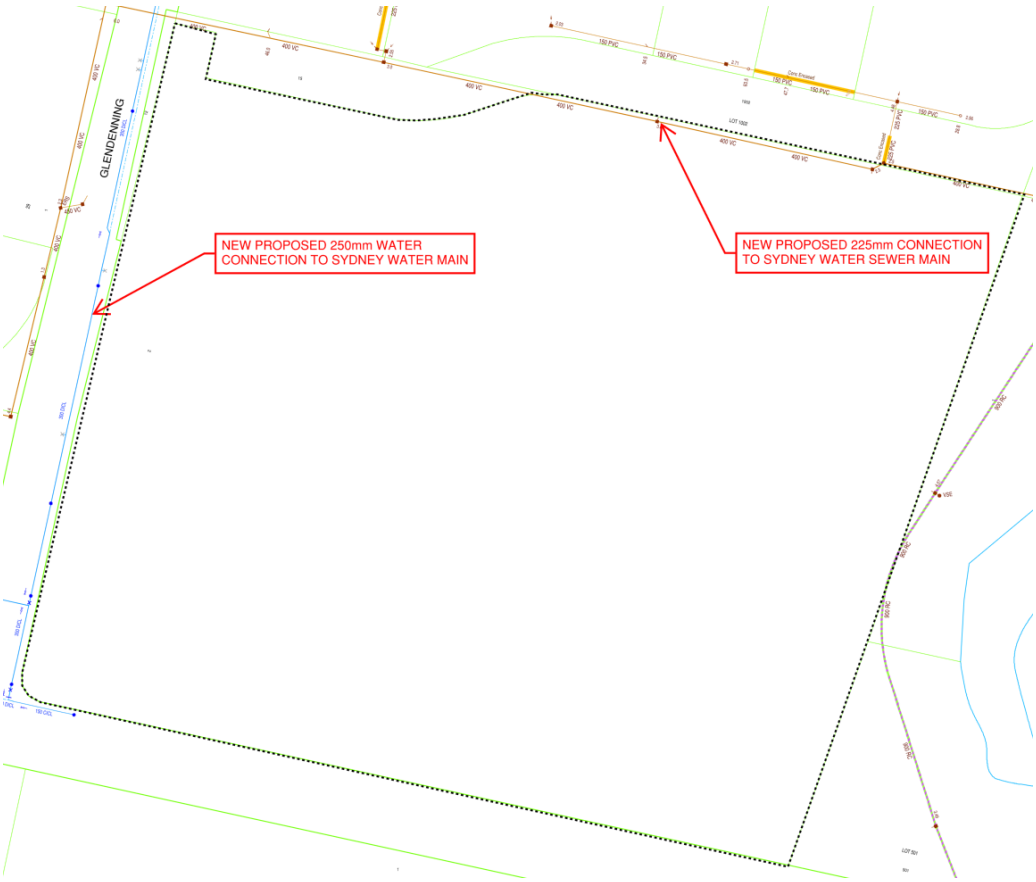


Figure 5 Sydney Water Before you Dig Australia (BYDA) Water and Sewer Connections Map

2.2 Electrical

2.2.1 Introduction

The proposed development site is within the authority of Endeavour Energy (EE) network, with existing Endeavour Energy electrical assets within the site and adjacent to the site boundary.

Preliminary negotiations with the supply authority have already commenced between the client and Endeavour Energy, with a connection offer received on 14th March 2023. The connection offer from Endeavour Energy is attached in Appendix 2.

2.2.2 Existing

There is currently an existing Endeavour Energy pad mounted substation on the western side of the site, adjacent Glendenning Road. It is proposed to retain this kiosk substation in its current location, until the existing building on the northwest side of the site is demolished.

To the south of the site, there is also a 132kV Endeavour Energy transmission tower and easement. These transmission towers are proposed to be retained and not impacted by the proposed site works.

Refer to Figure 6 below for the approximate of the pad mounted substation and 132kV transmission towers.

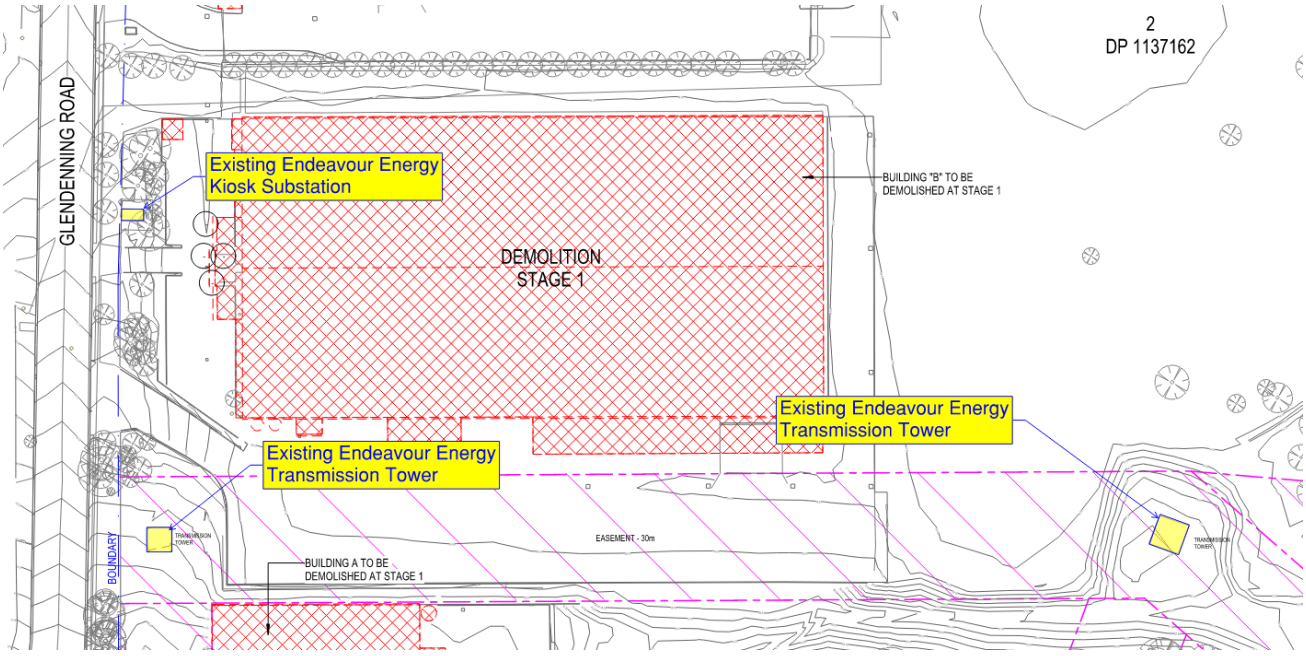


Figure 6. Location of Endeavour Energy Assets.

2.2.3 Proposed

It is proposed that the new development will be supplied via an underground 132kW feeder connected to the local 132kV Endeavour Energy network. This underground feeder will reticulate from the Endeavour Energy easement at the south of the site, along the eastern site boundary and into GIS switchroom located with the first data centre building (DC01). The final location and arrangement of the incoming 132kV feeder is subject to further design

development and coordination with Endeavour Energy. Refer to Figure 7 below for the proposed 132kV underground feeder pathway (pending design development and further coordination).

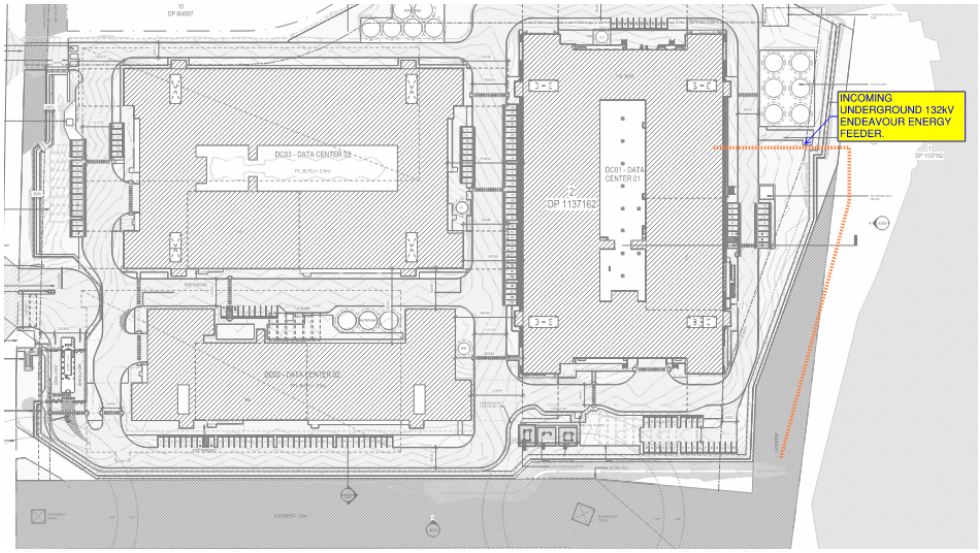


Figure 7 Proposed 132kV Incoming Endeavour Energy Feeder (pending design development and coordination with Endeavour Energy)..

Within the site, there will be separate 132kV and 22kV underground feeders to provide HV electrical supplies from DC01 to DC02 and DC03. These underground feeders will be privately owned and operated by the client and not managed by Endeavour Energy. Refer to Figure *8* below.

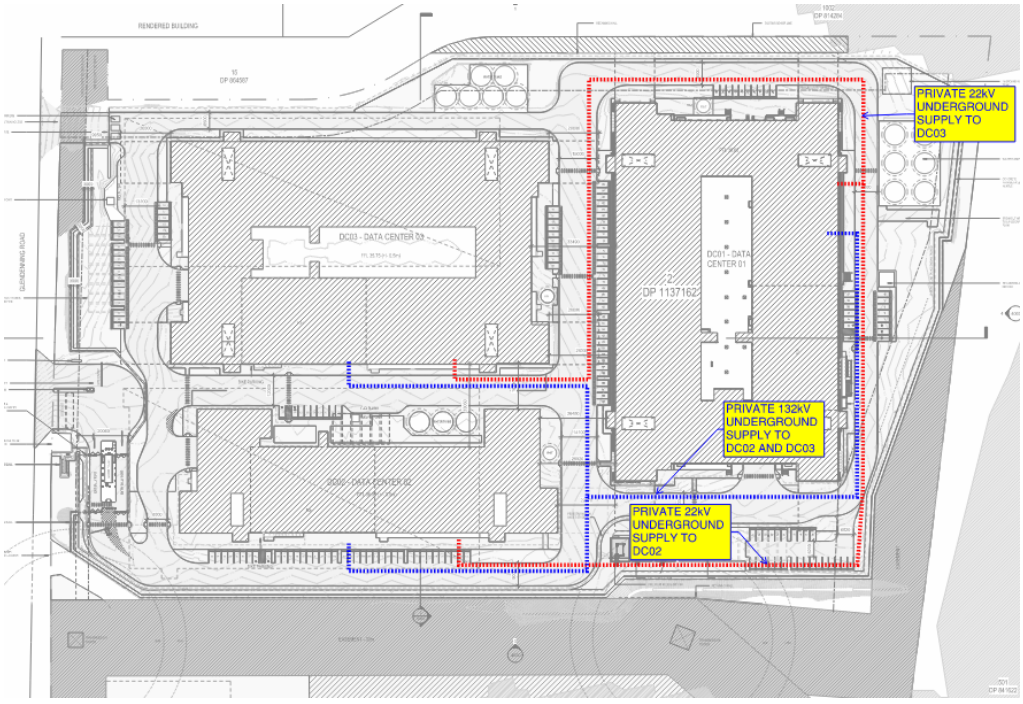


Figure 8 Proposed private 132kV (blue) and 22kV (red) feeders within the site.

Each data centre building will contain the following 132/22kV transformer arrangement, which will supply multiple 22kV switchboards within each building:

- **DC01:** 2 x 80/100MVA 132/22kV oil type transformers.
- **DC02:** 1 x 60/65MVA 132/22kV oil type transformer.
- **DC03:** 1 x 80/100MVA 132/22kV oil type transformer.

The 22kV network within each building will be arranged in a ring topology, supplying multiple ring main units and 22kV/0.4kV dry type transformers on each floor.

2.2.4 Back-up Power Supplies

Low voltage diesel generators will be provided for each building on the site to support the site loads during mains power failure events. These generators are designed to operate in standby in the case of a power outage only.

Each generator will be housed in a prefabricated generator enclosure with noise attenuation and an internal day tank designed to comply with AS1940. These generator enclosures will be located in external generator plantrooms on each floor (excluding the roof level).

The proposed generator are as follows:

- **DC01:** 38 x 2.8MV + 1 x 1.5MV containerised diesel generators.
- **DC02:** 16 x 2.8MV + 1 x 1.25MV containerised diesel generators.
- **DC03:** 38 x 2.8MV + 1 x 1.5MV containerised diesel generators.

The above generator sizes are estimates only, with the final sizing pending further development and coordination.

2.2.5 Alternate Back-up Power Supplies

As part of the design development process, the project team has considered alternatives to diesel fuel for providing the requisite standby power which is fundamental to ensuring the buildings redundancy requirements. The investigation concluded that given the scale of the electrical power demand of the site, coupled with redundancy requirements and risk associated with any failure, a diesel generator standby power provision is justified and the most appropriate.

The reality is that diesel generator technology is a mature industry with minimal risk given the level of expertise present and proven reliability of a well maintained installation. Alternative technologies with any comparable energy diesel fuel are still in their infancy, and It is not reasonable to apply the risk to the continuity of operations for the life of the project.

Technologies which have been considered in some form are described below.

- **PV Solar System**

  Whilst PV systems are a common renewable technology, they are unable to provide continuous power availability, or the reliability required by the project without some form of battery storage. The site electrical demand is circa. 230 megawatts, with a 48 hour back up availability. The scale of any installation required to store and recharge a battery solution via a PV system is not feasible from a spatial, cost or infrastructure perspective.
- **Alternative Fuel Generators (Hydrogen)**

  One of the more promising technologies is the substitution of diesel with hydrogen as a fuel source for generators. A large benefit of this is that the infrastructure downstream of the engine is essentially the same as a typical diesel generator. However, the engines would require a reliable source of fuel in large quantities. The current market or industry does not offer any known supplier which could cater for the

demand. Additionally, the size of each engine would need to be equivalent to the current diesel engines, which cannot be procured in the required scale at this stage. Another issue to consider is the safety implication of introducing such an energy dense, explosive fuel which must be stored under pressure. A benefit of diesel fuel is that it is not flammable, but combustible under the classification of AS1940. This means it is relatively difficult to ignite.

2.2.6 Onsite Fuel Storage

To supplement the containerised generator day tanks, each data centre building will have multiple underground bulk fuel storage tanks to provide a total of 24 hours fuel storage for all generators operating at 100% load, consisting of:

- **DC01:** 9 x 110kL underground fuel storage tanks.
- **DC02:** 6 x 110kL underground fuel storage tanks.
- **DC03:** 9 x 110kL underground fuel storage tanks.

2.3 Information and Communication Technology

2.3.1 Telecommunications Lead-Ins

Multiple carrier point-of-entries (POEs) into the campus are provided at the Eastern and Western boundaries of the development. Multiple POEs are required for capacity and resiliency. Alternate carriers may be also used for capacity and resiliency.

These POEs act as a telecommunications pathway demarcation point between the private property and the telecommunications carriers. Telecommunications carriers will meet and connect into these POEs for regional connectivity between the campus and other major telecommunications facilities including exchanges, gateways, other data centres etc. There is a total of 4no. POEs at the front development with 2no. along Glendenning Road, near entrance, and 2no. along the eastern boundary as shown in Figure 9. The pathways are provided via underground telecommunications pit and pipe. This lead-in pipe is owned by the carrier up until the POE at the property boundary. A sub-duct may then be provided with a carrier cable contained within it. This is routed via the private pathways to the appropriate termination point within the campus.

Some Telecommunications pathways are adjacent to easements, and the client's Telecommunications Team will coordinate these pathways in conjunction with utilities providers outside of the property boundary,

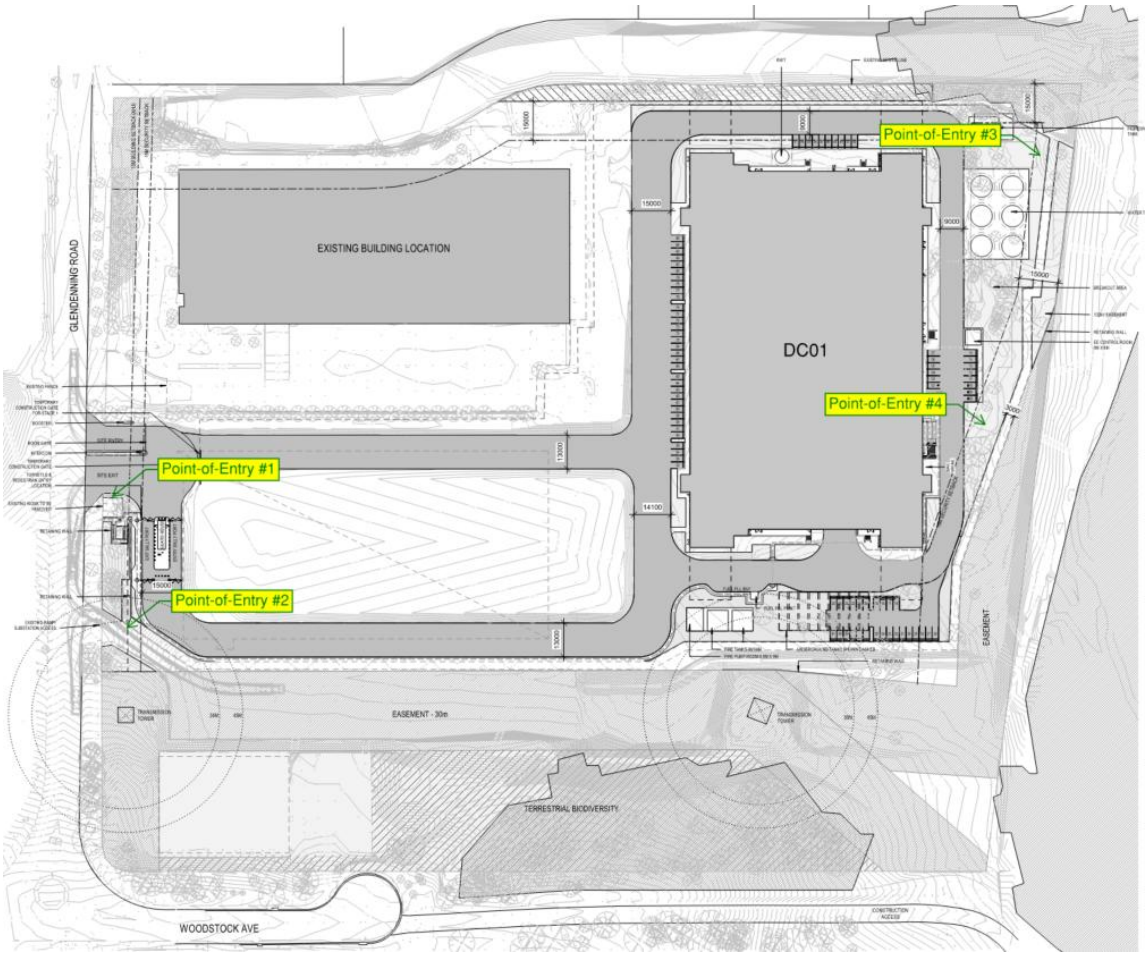


Figure 9 Point-of-Entries for Telecommunications

Initial pit and pipe carrier connectivity will be provisioned to enable the facility. Where increased capacity and resiliency is required to meet the operational demand during the operation of the facility, subsequent further connections to the POE may be made.

Carrier connectivity usually ties into already available infrastructure routed along the road reserve near-by. To meet resiliency or capacity requirements, runs of new conduit pathways may be made between the existing carrier pit and pipe within the road reserve, and to the point of demarcation/POEs. External reticulation to the POEs will require careful carrier planning. This is typically handled by the telecommunications carriers on application for connection.

All the internal reticulation between the POEs to the building structure is via private infrastructure consisting of telecommunication vaults and communications conduits spanning between these vaults. These pathways will be sized to minimise subsequent on-site excavation activities during the life of the facility.

Appendix A Sydney Water Feasibility Letter

Case Number: 216245

September 12, 2024

LCI Consultants
c/- AUSFLOW PTY LTD

Feasibility Letter

Developer:	**LCI Consultants**
Your WSC's reference:	**AE0011**
Development:	**Lot 2 DP 1137162 2 GLENDENNING RD, Glendenning**
Development Description:	**The development will include the construction of three data centres on the site which will require new sewer and water connections to Sydney Water Infrastructure.**
Your application date:	**July 5, 2024**

Dear Applicant

This Feasibility Letter (Letter) is a guide only. It provides general information about what our requirements could be if you applied to us for a Section 73 Certificate (Certificate) for your proposed development. **The information is accurate at today's date only.**

We have not allocated any system capacity to your proposal from the investigation into this Feasibility advice. This advice is only an indication of our systems and possible requirements as of today. Where there is system capacity, it may have been fully utilised by the time you obtain a Consent. The requirements applied to any approved Development proposal may differ significantly in the future since the original advice was issued.

If you obtain development consent for that development from your consent authority (this is usually your local Council) they will require you to apply to us for a Section 73 Certificate. You will need to

submit a new application (and pay another application fee) to us for that Certificate by using your current or another Water Servicing Coordinator (WSC).

We'll then send you either a:

- Notice of Requirements (Notice) and Developer Works Deed (Deed)
  or
- Certificate.

These documents will be the definitive statement of our requirements.

There may be changes in our requirements between the issue dates of this Letter and the Notice or Certificate. The changes may be:

- if you change your proposed development eg the development description or the plan/site layout, after today, the requirements in this Letter could change when you submit your new application

- if you decide to do your development in stages then you must submit a new application (and pay another application fee) for each stage.

You have made an application for specific information. Our possible requirements are:

WATER

The closest existing trunk infrastructure to the development is a DN300. However, ***the water supply zone does not have the capacity to supply peak demands as advised by this feasibility application.***

You will need to engage a hydraulic consultant to identify alternative options to service the development.

The assessment needs to include a review of the annual demand and peak daily, peak instantaneous demand for each stage. The option assessment will also need to demonstrate that on site storage is used to balance the peak instantaneous demand to reduce the impact to Sydney Water network and Reserve Storage Level (RSL) at Minchinbury reservoirs and other customers.

SEWER

The high-level assessment indicates that the trunk system (DN400) may have capacity to service this development. This will be confirmed during the Sec 73 application.
Design will be assessed during section 73 application.

The discharge from Data Centre should meet the quality requirement of wastewater discharge onto sewer network.

1. Infrastructure contributions

You will need to pay an infrastructure contribution towards the cost of each Sydney Water system that will serve your development.

The infrastructure contributions are calculated in accordance with the Development Servicing Plans registered with the Independent Pricing and Regulatory Tribunal (IPART) under the *Independent Pricing and Regulatory Tribunal Act*.

An estimate of your infrastructure contributions is shown in the table below. These amounts have the NSW Government-directed cap applied for the current financial year**. These amounts are subject to the NSW Government transition pathway and other factors and will change** – see Section 6.1 Price Changes for full details.

No payments can be accepted for these estimates. Should you obtain Development Approval for this proposal and apply for a Section 73 Certificate in the future, then we'll advise you of the applicable charges to your Development.

Development Servicing Plan (DSP)	**Basis of Calculation**	**Charge ($) for Applicable Period (12/9/24-30/6/25)**
Greater Sydney Drinking Water	Other Flow 625.116 @ $850 per ET = $531348.84 based on Flow rates in paragraph below less Credit of $0.0 for previous payment/use	$531,348.84
Lower South Creek Wastewater	Other Flow 175.263 @ $1601.48 per ET = $280680.44	$280,680.44

	based on Flow rates in paragraph below less Credit of $0.0 for previous payment/use	
DEVELOPER CHARGES TOTAL:		**$812,029.28**

- The charges in the table are based on your development needing an average day water demand of UPDATE BASED ON 269KL used in IC calculation kl and an average day sewer discharge of UPDATE BASED ON 67KL used in IC calculation kl.
- **If the** development **generates a greater demand, you may have to pay more in charges. If you are going to sell the** development**, you have to explain the situation to prospective buyers as part of the requirements of Vendor Disclosure.**

1.1 Price changes

The infrastructure contribution you must pay may also change due to:

1. Changes to the Consumer Price Index (CPI). Our prices increase by CPI each financial year. CPI is the weighted average of the capital cities CPI for the 12 months to the end of the previous March.

2. The NSW Government-directed transition pathway for infrastructure contributions for drinking water and wastewater infrastructure:

Financial Year payment is made	Percentage of infrastructure contribution payable
1 July 2023 to 30 June 2024	Infrastructure contribution capped at 0% of the full price
1 July 2024 to 30 June 2025	Infrastructure contribution capped at 25% of the full price
1 July 2025 to 30 June 2026	Infrastructure contribution capped at 50% of the full price
1 July 2026 onwards	Full price payable

3. Any updates to our Development Servicing Plans (including prices). Our Development Servicing Plans must be updated every five years. The next updates will be introduced by 31 December 2028.

Your infrastructure contributions become payable once your WSC has submitted all Project Completion Packages under each Developer Works Deed to us confirming that the works required under the Notice are complete.

No warranties or assurances can be given about the suitability of this document or any of its provisions for any specific transaction. It does not constitute an approval from us and to the extent that it is able, we limit its liability to the reissue of this Letter or the return of your application fee. You should rely on your own independent professional advice.

Appendix B Endeavour Energy Connection Offer

17 March 2023

Endeavour Energy Ref: [redacted]

[redacted]
[redacted]
SYDNEY
NSW 2000

Attention: [redacted]

CONNECTION OFFER – STANDARD CONNECTION SERVICE

[redacted] - 132KV SUPPLY CONNECTION | 180 MVA | [redacted] | 2 GLENDENNING ROAD, GLENDENNING

Dear [redacted],

Thank you for your application providing information of the proposed [redacted] [redacted] Data Centre development at the above location as shown below. Your application has been registered under the above reference number. Please quote this reference number on all future correspondence.

This connection offer is made in accordance with the Terms and Conditions of the Model Standing Offer for a Standard Connection Service available on our website. To accept this offer, please complete the enclosed Notice of Advice form and obtain your Level 3 Accredited Service Provider (ASP) signature on the form prior to returning it to Endeavour Energy.

Endeavour Energy has completed a preliminary desk top assessment of the information provided in your application and issued an enclosed Supply Offer. Your next step is to obtain the services of a Level 3 ASP to prepare and provide an electrical design to Endeavour Energy in the form of a Proposed Method of Supply. This activity is customer funded contestable work and you will need to pay for it. An estimate of fees related to review of your design is attached.

A list of the Accredited Service Providers is available at the NSW Trade and Investment website: *https://energysaver.nsw.gov.au/households/you-and-energy-providers/installing-or-altering-your-electricity-service* or can be obtained via phone 13 77 88.

Please note under the National Electricity Rules (NER) customer may choose to enter into a negotiated agreement. A negotiation framework describing this process is available on our website.

Should you have any enquiries regarding your application please contact the undersigned.

Yours faithfully,

David Ho

David Ho | Senior Customer Network Engineer | Customer Network Solutions
T 9853 7901 ✉ david.ho@endeavourenergy.com.au

17 March 2023

Endeavour Energy Ref: [redacted]

Endeavour Energy
PO Box 811
Seven Hills NSW 1730
cwadmin@endeavourenergy.com.au

Attention: Customer Connections Administrator

NOTICE OF ADVICE

APPOINTMENT OF ACCREDITED DESIGNER FOR THE PROPOSED DEVELOPMENT AT: [redacted] | 2 GLENDENNING ROAD, GLENDENNING

**** Please complete and return when a Level 3 Service Provider has been nominated****

Please accept this letter as notification that I intend to proceed with the development described above. I own or am developing the land and works on the land, (and/or where relevant on public land). I intend to supply this development to Endeavour Energy requirements.

By signing this Notice of Advice I am accepting the Terms and Conditions of Endeavour Energy's Model Standing Offer for a Standard Connection Service.

The Level 3 Service Provider appointed is:

The Fees will be Paid to Endeavour Energy by:

Name / Company: ……

Address: ……

Email: …… Phone: ……..

…… Signature of Level 3 ASP	…… Name of Level 3 ASP
…… Signature of Applicant/ Applicant's Representative	…… Name of Applicant/ Applicant's Representative
…… Date	…… Company Name

The signatory warrants that they are authorised to execute this Application.

APPLICATION NO: [redacted]
DATE: 14 March 2023

SUBJECT: SUPPLY OFFER FOR
2 Glendenning Road, GLENDENNING

Endeavour Energy has carried out a desk top assessment and has prepared the attached Supply Offer for this development.

The supply offer will assist your Level 3 ASP to develop the most efficient solution to meet your needs whilst complying with Endeavour Energy's standards and with the Terms and Conditions of the Model Standing Offer for a Standard Connection Service. Please find below a list of some requirements that will need to be addressed by your nominated Level 3 ASP.

- Field visit to verify physical details
- Trench length
- Cable length
- Length of cable using existing ducts
- Length of new ducts required to be installed
- Substation location shown on a preliminary sketch and HV switchgear numbers
- Types and number of poles to be replaced or installed
- Complexity of trenching (ie rock, under-bore, commercial area etc)
- Earthing requirements and complexity
- Overhead construction and isolation point requirements
- Asset Valuation form must be completed including any extraordinary costing requirements
- Environmental issues addressed in a fully documented Environmental Assessment
- Generation requirements
- Rail Crossing requirements

A sketch of the proposed design utilising the GIS as a base must be returned with the above information.

This Supply Offer is part of the Connection Offer for a Standard Connection Service and is valid for twelve (12) months from the date of issue.

Where this Connection Offer has lapsed, you or your Level 3 ASP must contact Endeavour Energy with the request to extend the Connection Offer. Endeavour Energy will assess your request and will inform you of the outcome. It must be recognised that the network is being constantly extended/augmented as new customers get connected. This means that for your Connection Offer to be extended, your Supply Offer may require alteration. If this is the case, additional fees to cover administrative costs may apply.

The fees applicable to this phase of the project will need to be paid prior to design certification and are outlined in the Network Price List available on the Endeavour Energy website.

14 March 2023

Endeavour Energy Ref: [redacted]

SUPPLY OFFER
(Based on a desktop assessment)

Development Details & Applicant's Assessed Load:

Endeavour Energy (Endeavour) acknowledges that [redacted] Data Centre would require ultimate load of 180MVA at 132kV by 2033 and initial supply of 25MVA will be required by March 2026.

Proposed Load Growth Profile

Year	Load Demand (MVA)	
	Required load	Accumulative
2026	25	25
2027	25	50
2028	25	75
2029	25	100
2030	20	120
2031	20	140
2032	20	160
2033	20	180

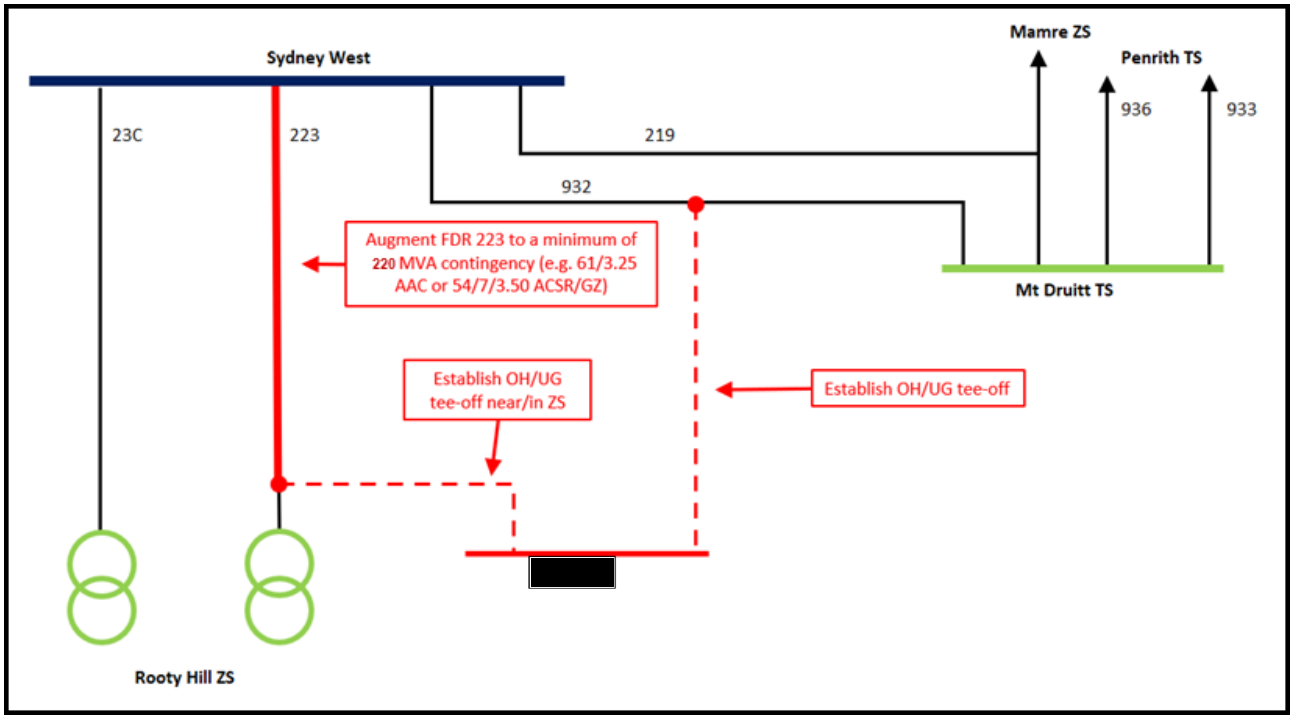
Endeavour Energy Assessed Load:

To accommodate the required load based on your load growth profile of the [redacted] Data Centre development, it is figured out that the development will be supplying from 132kV feeders, 932 and 223.

[redacted] must install one (1) x 132kV cables (roughly cable length 6.5km) from the development site and connect the cable on the 132kV feeder 932 at appropriated location and one (1) x 132kV cables (roughly cable length 1.5km) from the development site and connect the cable on the 132kV feeder 223 at appropriated location near or within Rooty Hill ZS.

Location Map and Simplified SLD are attached on the next page for further reference.

Because of capacity constraint of existing 132kV feeder 223, it can only available capacity to [redacted] the initial load 100MVA up to 2029, thereafter augment work is needed to increase the capacity to cater for the increase load of [redacted]. In principle, it is up [redacted] to augment the overhead conductors in one go or in stages, moreover ultimately the conductors must be augmented to a minimum capacity of 220MVA by 2033.



It is expected that the new 132kV feeders will terminate into the Customer's 132kV substation, however the exact location is dependent on the Customers substation type and layout and will require easements in Endeavour's favour prior to initiating construction works to install proposed assets for Endeavour ownership.

For an indoor type of substation, Endeavour has contemplated the Customer's primary Connection Points to be at the incoming terminals of the Customer's 132kV GIS switchgear; alternatively, for

an outdoor air insulated substation, this may be at the Endeavour cable sealing end stands or line side terminals at an overhead substation gantry.

For secondary Connection Points associated with Endeavour's feeder protection and communications systems, the Customer will have to provide an Endeavour Protection & Control room approximately five (5) metres by five (5) metres within the Customer's site. This room may be integrated into the Customer's substation building although ownership of this room is not to be transferred to Endeavour and appropriate easements to Endeavour standard MDI0044 and 24-hour unrestricted personnel and right of access will be needed. The above arrangement precludes the need for the Customer to establish an Endeavour owned 132kV switching station as connection assets on the Customer's property.

Connection Asset Requirements:

Load forecasted on 132kV feeder 223 is shown as below.

Year	[redacted] Load Demand (MVA)		EE Load (MVA)	Feeder 223 load (MVA)	
	Required	Accumulative		Normal	Contingency
2026	25	25	20 normal / 40 Contingency	45	65
2027	25	50		70	90
2028	25	75		95	115
2029	25	100		120	140
2030	20	120		140	160
2031	20	140		160	180
2032	20	160		180	200
2033	20	180		200	220

Endeavour has conducted a further investigation of 132kV feeder 223 based on available network characteristic, which we found there is discrepancy between conductors in network characteristics and GIS, and decide the following scenario.

- Sections A to E : Total 6.54km and is rated at 120MVA continuous and 175MVA emergency.
- Section F : Total 0.11km and is rated at 145MVA continuous and 175MVA emergency.
- Section G to H : Total 4.18km and is rated at 130MVA continuous and 130MVA emergency.

Conductors are listed below for reference.

Circuit		From	To		Ratings (A)				
		Conductor	Earth Wire	km	Tc	Cont.S	Cont.W	Emer.S	Emer.W
223	Σ	Sydney West BSP	Rooty Hill ZS	10.83		525	800	569	0
	A	ACSR/GZ Mango (54/7/3.00)	2x AAAC 1120 Krypton (19/3.25)	3.09	85	525	919	765	0
	B	2xACSR/GZ Olive (54/7/3.50)	2x SC/GZ (7/3.75)	0.99	85	525	919	765	0
	C	ACSR/GZ Mango (54/7/3.00)	2x AAAC 1120 Krypton (19/3.25)	0.47	85	525	919	765	0
	D	2xACSR/GZ Olive (54/7/3.50)	2x SC/GZ (7/3.75)	1.47	85	525	919	765	0
	E	ACSR/GZ Mango (54/7/3.00)	2x SC/GZ (7/3.75)	0.52	85	525	919	765	0
	F	ACSR/GZ Mango (54/7/3.00)	2x SC/GZ (7/3.75)	0.11	85	639	919	765	0
	G	ACSR/GZ Lime (30/7/3.50)	SC/GZ (7/3.25)	0.52	85	569	800	569	0
	H	ACSR/GZ Lime (30/7/3.50)	2x SC/GZ (7/3.75)	3.66	85	569	800	569	0

A proper detail mains assessment will be conducted sooner to verify about findings.

The Customer's next step is to obtain the services of a Level 3 ASP to prepare and supply a draft electrical design and submit to Endeavour as a Proposed Method of Supply. As noted above, the appointed Level 3 ASP must conduct transmission underground and substation design works. To accept this Offer, please complete the enclosed Notice of Advice form and obtain your Level 3 ASP signature on the form prior to returning it to Endeavour.

Once a Proposed Method of Supply is agreed, Endeavour can initiate preparation of a Technical Brief (TB) which is a detailed scoping document that will form part of Endeavour's Design Brief to the Level 3 ASP and Endeavour's internal staff for the design, construction and commissioning works, including the Customer's primary equipment requirements and secondary systems coordination. The TB will define Contestable and Non-contestable works and identify estimate of costs associated with Customer funded non-contestable works including protection, control, testing and commissioning works. Preparation of the TB will take minimum 12 weeks and if the customer accepts this Offer and can confirm the proposed Customer substation concept without nominating a Level 3 ASP, Endeavour can initiate preparation of the TB.

Network Constraints & Limitations

Subject to concept and feasibility studies, Endeavour would consider in principle accepting the connection to 132kV feeder 223 within Endeavour's Rooty Hill Zone Substation.

Access to 132kV feeder 932 is restricted in some seasons and a resonabele recall is required.

CONNECTION REQUIREMENTS

CUSTOMER'S INSTALLATION

The Customer's installation will originate at the Connection Points defined as the load side terminals where Endeavour's 132kV feeders connect to the Customer's 132kV substation. Secondary connection points will be where the Customers secondary systems are integrated into Endeavour's feeder Protection and Control room as mentioned earlier. The Customer's installation must be designed and constructed in accordance with AS2067, AS3000, Service and Installation Rules of NSW, and other relevant Australian Industry Standards.

It must be noted that supply will not be made available until the Customer's 132kV Installation has been inspected by Endeavour's Customer Installation Section. Certificate of Compliance for Electrical Works (CCEW), high voltage test reports and any other relevant documentation must be submitted prior to the initial inspection. Arrangements for this inspection can be made with Endeavour's Customer Installations Section no later than four (4) weeks prior to the Customer's proposed commissioning date. Inspections must be booked two weeks prior to the required inspection date via the following email Inspection@endeavourenergy.com.au.

Please allow a minimum of four weeks' notice to arrange a HV Customer's Installation audit prior to the proposed commissioning date.

SINGLE LINE DIAGRAM

The proposed Single Line Diagram (SLD) for the Customer's installation must be submitted for review. It is recommended that construction of the Customer's installation does not commence prior to Endeavour's review of the SLD. The SLD must include reference to Endeavour 132kV feeder, 132kV connection points, incoming control and protection devices, proposed line side earth switches, location and details of metering transformers, proposed protection schemes and bus sections (if applicable). Endeavour will need proposed SLD's of all voltages including location of

proposed UPS and generation systems including transition methodology.

Endeavour does not allow customers to parallel supplies as this creates operational risks and can trigger operation of Endeavour's protection schemes. Paralleling of the incoming supplies is not allowed at any voltage unless under the direct control of Endeavour's System Operators.

Please ensure SLD's of the Customer's installation extending to all voltage levels is provided which include any generation facilities, and automatic or manual paralleling facilities, along with any proposed engineering or operational controls, intended to inhibit inadvertent paralleling of incoming supplies at any voltage level.

FAULT LEVEL

In conformity with Clause 7.4.4 of the Service and Installation Rules of NSW, the prospective fault level at the Connection Point is 40kA for 1 second. The customer's equipment up to (and including) the incoming protective device must meet this minimum fault level.

Please refers to Earth Fault Protection Information as shown on Appendix A for reference.

PROTECTION CHARACTERISTICS

The Customer's incoming protection device will form part of Endeavour's protection scheme for each of the Endeavour 132kV feeders.

A Protection Concept & Design Agreement (PCDA) will need to be drafted to ensure coordination of Endeavour's feeder differential protection schemes and the Customer's incoming protection device. As part of the PCDA Endeavour will also review and agree on the Customer's 132kV installation protection for back up protection requirements such as Cbfail, relay redundancy to ensure Endeavour maintains system security obligations under the National Electricity Rules.

Following the Project Definition, Endeavour will draft a Protection and Indication Equipment Schedule (PIES) for Endeavour protection requirements in line with Endeavour policy, at this time the Customer must provide details of the Customer's proposed incoming circuit breaker protection scheme to enable Endeavour's Protection Engineers to review the design and draft a PCDA.

To enable the Customer or their electrical consultants to prepare protection and earthing reports, when requested, Endeavour will provide the phase to phase and phase to earth fault levels, network characteristics at the proposed feeder connection points under normal network operating conditions.

REVENUE METERING

The Customer is responsible for the provision of separate metering on both incoming supplies. Metering transformers must be incorporated into the SLD to meet the minimum requirements of Type 3 Metering for a high voltage installation however it is recommended that Type 2 Metering is designed and reviewed by the Customer's Electricity Retailer or Meter Provider for compliance with Chapter 7 - "Metering" of the National Electricity Rules.

Prior to Commissioning the Customer's installation, Endeavour requires either the Meter Provider or the Electricity Retailer to provide written confirmation that compliant metering has been installed in accordance the National Electricity Rules and provide an NMI for each supply with the correct Standing Data and Network Tariff (N39 or Site Specific (GoR) - Refer Network Price List) for this type of connection. This written confirmation must be submitted to the Contestable Works Project Manager (undersigned) and received prior to commissioning of the Customer's High Voltage Installation.

It is further noted that metering transformer test certificates must be provided to Endeavour's

Customer Installation Section as part of the documentation during the installation inspection, prior to connection of the Customer's installation.

OPERATIONAL ARRANGEMENTS

The Customer is responsible for operation and maintenance of the high voltage installation including 132kV electrical assets, metering and any agreed site-specific conditions beyond the Connection Point.

Prior to connection, the Customer must contact Endeavour's Major Customer Manager, Mr Ahmad Chehade on mobile 0404 007 227 to draft High Voltage Operation and Maintenance Protocol (Protocol) between Endeavour and the Customer. The site-specific conditions, including the division of responsibility, and operational and emergency contacts are to be included in the Protocol.

Site-specific conditions will be negotiated prior to connection and commissioning and once the Customer's installation is commissioned and connection assets accepted by Endeavour under the MSO, these site-specific conditions will form part Deemed Standard Connection Contract for Large Customers.

POWER FACTOR

The installation Power Factor is to meet NSW Service and Installation Rules referring to National Electricity Rules requirements. These require a minimum 0.95 lagging Power Factor in accordance with section 5.3.5 'Power Factor Requirements' of National Electricity Rules.

It is expected that the installation will maintain unity (1.0) or less power factor and not enter a leading range.

If, following connection of this installation, the site power factor does not meet these requirements, it must be improved by connection of power factor correction units within the timeframe set at the time the improvement works are determined.

QUALITY OF SUPPLY REQUIREMENTS

The voltage regulation and harmonic content resulting from the load being connected to the Endeavour Energy network must not affect the supply of adjacent customers. Therefore compliance is required with the criteria defined in the following documentation:-

AS/NZS 61000 Series;

- Part 3.2 relates to Harmonic Currents
- Parts 3.3 and 3.5 relate to Voltage Fluctuations and Flicker
- Parts 3.6 and 3.7 relates to Assessment of Emission Limits for "Distorting" and "Fluctuating" loads in MV and HV power systems.

Endeavour will set parameters outside of these documents in relation to the equipment being connected as part of the installation, therefore Endeavour Energy have provided flicker and harmonic allocations consistent with the expected total load of the site.

Please see attached Power Quality Allocation document for reference

Validity

This Connection Offer for a Standard Connection Service and is valid for twelve (12) months from the date of issue.

Where this Connection Requirements letter has lapsed excluding customer installation requirements, you or your pre-qualified Level 3 ASP must contact Endeavour Energy with the request to extend the Connection Offer. Endeavour Energy will assess your request and will inform you of the outcome. It must be recognised that the network is being constantly extended/augmented as new customers get connected. This means that for your Connection Requirements to be extended, your Connection Requirements may require alteration. If this is the case, additional fees to cover administrative costs may apply.

14 March 2023

Endeavour Energy Ref: [redacted]

Initial Funding Arrangements

Endeavour Energy Supplied Materials:

Nil

Endeavour Energy Funded and Constructed:

Nil

Endeavour Energy Funded and Level1 ASP Constructed – Reimbursement Paid by Endeavour Energy

Nil

Reimbursement to be paid to Endeavour Energy by Customer:

Nil

Customer Funded Monopoly Services:

Network switching, commissioning, contractor inspection, ancillary fees, etc.

Customer Funded Contestable Works:

All other works required

Appendix A

Endeavour Energy

EARTH FAULT PROTECTION DATA FOR SUBSTATION EARTHING

Location:	[redacted]	Revision/Date:	Rev 0 – 14/03/2023
Study By:	Craig Muras		
Notes:	HVC substation to be fed by two teed feeders, 223 and 932. These feeders are to be on change-over. The HVC substation is not to be run in parallel. Protection on proposed teed feeders is assumed to be duplicate differential with duplicate communications paths.		

The data given below is the existing fault data (or anticipated near future fault data), which can be used to ensure that step & touch potentials are satisfactory in accordance with Endeavour Energy EDI 516 (Earthing in transmission/zone substations and switching stations). The current magnitudes given are the initial value of symmetrical fault current with an applied voltage factor (c) = 1.1 as required by AS3851-1991 for the calculation of maximum fault levels. The clearing times includes relay operating time and CB clearing time

Fault:	**132kV Φ-E Fault feeder 223 – Sydney West BSP to Rooty Hill ZS tee HVC** [redacted]		
	Fault Data		**Step Time**
Fault Level Data Step 1:	ENDEAVOUR ENERGY FAULT LEVEL DATA – IEC60909 1990/AS 3851 METHOD MAXIMUM Fault Levels: c-Factor = 1.10, Temp = 20.0 deg Bus Name V(kV) | 3ph(kA) 3ph(deg) X/R | 2ph-g(kA) 2ph-g(deg) 3*Io(kA) X/R | 1ph-g(kA) 1ph-g(deg) X/R Terminal(41) 132.0 | 11.64 -83.0 8.2 | 11.12 166.3 7.87 4.9 | 9.40 -80.2 5.8 R1(%) X1(%) R0(%) X0(%) 0.50 4.10 1.59 6.93		NA
Total Primary Clearing Time:	220ms	Notes: Standard clearing time for 132kV faults as per NER.	
Total Backup Clearing Time:	430ms	Notes: Standard clearing time for a CB fail condition on 132kV as per NER.	
Notes:	Only 132kV feeder 223 feeding the HVC busbar		

Endeavour Energy

Fault:	132kV Φ-E Fault feeder 932 – Sydney West BSP to Mount Druitt TS tee HVC [redacted]	
	Fault Data	**Step Time**
Fault Level Data Step 1:	ENDEAVOUR ENERGY FAULT LEVEL DATA - IEC60909 1990/AS 3851 METHOD MAXIMUM Fault Levels: c-Factor = 1.10, Temp = 20.0 deg Bus Name V(kV) | 3ph(kA) 3ph(deg) X/R | 2ph-g(kA) 2ph-g(deg) 3*Io(kA) X/R | 1ph-g(kA) 1ph-g(deg) X/R Terminal(42) 132.0 | 15.75 -85.2 11.8 | 15.50 166.2 10.13 3.3 | 12.40 -77.9 4.7 R1(%) X1(%) R0(%) X0(%) 0.26 3.04 1.92 5.30	NA
Total Primary Clearing Time:	220ms	Notes: Standard clearing time for 132kV faults as per NER.
Total Backup Clearing Time:	430ms	Notes: Standard clearing time for a CB fail condition on 132kV as per NER.
Notes:	Only 132kV feeder 932 feeding the HVC busbar	

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