Review of Environmental Factors

Brolgan Zone Substation

November 2024

Project No. 805896

Essential Energy

essentialenergy.com.au

REVISION HISTORY

VERSION	NATURE OF REVISION
Draft 01	Draft prepared for Essential Energy's Environmental Services review.
Final	Prepared for Essential Energy determination

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Acronyms and Abbreviations

ACRONYM/ABBREVIATION	DETAIL
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ADSS	All-dielectric self-supporting. A type of fibre optic cable which is nonconductive, self-supporting and is capable of being erected under tension between supports.
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASS	Acid Sulfate Soils
AASS	Actual Acid Sulfate Soils
AEMO	Australian Energy Market Operator
BDAR	Biodiversity Development Assessment Report
CEMP	Construction Environmental Management Plan
Consequence	The outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.
dB(A)	Decibels (A) weighted
DCCEEW (Cth)	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DCCEEW (NSW)	Department of Climate Change, Energy, the Environment and Water (New South Wales)
DPHI	Department of Planning, Housing and Infrastructure
DPE	Department of Planning and Environment (Former NSW Government Department)
DP	Deposited Plan
EMF	Electric and Magnetic Fields
Environmental Aspect	Any element of an organisation's activities, products or services that can interact with the environment.
Environmental Impact	Any change in the environment whether adverse or beneficial, wholly or partially resulting from organisation activities, products or services.
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Reg	*Environmental Planning and Assessment Regulation 2021*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPIs	Environmental Planning Instruments
ES Act	*Electricity Supply Act 1995*

ESD	Ecologically Sustainable Development
EWP	Elevated Work Platforms
FSC	Field Service Centre (Essential Energy)
FM Act	*Fisheries Management Act 1994*
GHG	Greenhouse Gas
Ha	Hectare
IPC	Independent Planning Commission
kV	Kilovolts
LALC	Local Aboriginal Land Council
Likelihood	A qualitative description of probability or frequency
LEP	Local Environmental Plan
LG Act	*Local Government Act 1993*
LGA	Local Government Area
mG	Milligauss
MVA	Mega Volt Amps
NES	National Environmental Significance
NO_x	Oxides of Nitrogen
NPW Act	*National Parks and Wildlife Act 1974*
PAP HVSP	Parkes Activation Precinct High Voltage Supply Project
PASS	Potential Acid Sulfate Soils
pHF	Field pH
pHFOX	Field pH peroxide test
POEO Act	*Protection of the Environment Operations Act 1997*
REF	Review of Environmental Factors
RF Act	*Rural Fires Act 1997*
Roads Act	*Roads Act 1993*
RMS	Roads and Maritime Service
SAP	Special Activation Precinct
SCADA	Supervisory control and data acquisition. A computer-based system for gathering and analysing real-time data to monitor and control equipment that deals with critical and time-sensitive materials or events.
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory

SHR	State Heritage Register
SIS	Species Impact Statement
SWMP	Soil and Water Management Plan
T&I SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
WM Act	***Water Management Act 2000***

REF Approval Form

PROJECT AND PROPONENT DETAIL

REF Name	Brolgan Zone Substation
Project Number	805896
REF Addendum prepared by	Nathan Hegerty
Title	Environmental Senior Specialist
Qualifications	Bachelor of Environmental Science Master of Environmental Law
Proponent Name	Essential Energy
Proponent Address	8 Buller Street, Port Macquarie NSW 2444

This Review of Environmental Factors (REF) assesses the potential impacts that may result from the proposed activities as outlined in "Description of the Proposal" section of this report.

Essential Energy is a state-owned corporation and is a determining authority as defined in the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal satisfies the definition of an 'activity' under the EP&A Act, and as such Essential Energy must assess and consider the environmental impacts of the proposal before determining whether to proceed. This REF has been prepared in accordance with Section 5.5 of the EP&A Act and Section 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg). The EP&A Act requires Essential Energy to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. The EP&A Reg sets out environmental factors to be considered in making that assessment. If the activity is considered likely to significantly affect the environment, additional assessment requirements under the EP&A Act would be required.

Section 5.7 of the EP&A Act states that a determining authority shall not carry out an activity, or grant an approval in relation to an activity, that is likely to significantly affect the environment (including critical habitat) or threatened species, populations or ecological communities, or their habitats, unless the determining authority has examined and considered an Environmental Impact Statement or Species Impact Statement in respect of the activity.

The REF has addressed the matters that are required to be considered by Part 5 of the EP&A Act, with the conclusion that if the activity is carried out as described, it is not likely to have a significant effect on the environment (including critical habitat) or threatened species, populations, ecological communities or their habitats, and accordingly an Environmental Impact Statement is not required. The mitigation strategies forming part of the activity are fully considered and discussed in the REF.

The activity was also assessed against the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). As the proposed activity will not have, and is not likely to have a significant impact on matters of national environmental significance, a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) is not required.

The proposed activity is permissible under all relevant state and federal legislation, including the EPBC Act and the *Biodiversity Conservation Act 2016* (NSW).

Under *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) the activity is classified as development for the purpose of an electricity transmission or distribution network undertaken by or on behalf of a public authority, and is hence permitted on the land without the requirement for development consent.

Declaration

The Review of Environmental Factors for the proposed activity has been assessed by Essential Energy.

Considering the assessment of the impacts, including Sections 1.7 and 5.5 of the Environmental Planning and Assessment Act 1979 and clause Section 171 of the Environmental Planning and Assessment Regulations 2021, it is concluded that:

- There is not likely to be a significant environmental effect as a result of the construction, operation and maintenance of the activity and an Environmental Impact Statement is not required; and
- A Species Impact Statement (SIS), or Biodiversity Development Assessment Report (BDAR) is not required.

AUTHOR DECLARATION

I affirm that the information provided within this assessment is accurate to the best of my knowledge, belief and information

REF prepared by	Nathan Hegerty
Signature	Nathan Hegerty Digitally signed by Nathan Hegerty Date: 2024.11.26 12:31:06 +11'00'
Title	Environmental Senior Specialist
Date	26 November 2024

PEER REVIEW DECLARATION

I affirm that the information provided within this assessment is accurate to the best of my knowledge, belief and information

Peer Review by	Tim Haydon
Signature	Tim Haydon Digitally signed by Tim Haydon Date: 2024.11.26 12:38:32 +11'00'
Title	Environmental Senior Specialist
Date	26 November 2024

PROJECT MANAGER REVIEW DECLARATION

The assessment has been reviewed and it is recommended that the Activity may now proceed subject to the implementation of the recommendations and mitigation measures contained in the REF documentation.

Project Manager Review by	Adam Hawke
Signature	Adam Hawke Digitally signed by Adam Hawke Date: 2024.11.26 13:39:53 +11'00'
Title	Senior Program / Project Manager
Date	

DETERMINATION

1. Considering the assessment of the impacts, including sections 1.7 and 5.5 of the *Environmental Planning and Assessment Act 1979* and clause section 171 of the *Environmental Planning and Assessment Regulation 2021*, it is determined that there is not likely to be a significant environmental effect as a result of the construction, operation and maintenance of the Brolgan Zone Substation. Neither an Environmental Impact Statement (EIS), nor SIS, nor BDAR is required.
2. The Activity may now proceed subject to obtaining and complying with the relevant approvals as identified in the original REF and subject to the implementation of the recommendations and mitigation measures contained in the REF documentation.

Signature	Brett Hayward Digitally signed by Brett Hayward Date: 2024.11.26 14:21:14 +11'00'
Determining Authority	Brett Hayward
Title	Environmental Services Manager
Date	

Executive Summary

Background / Justification

Essential Energy has received a connection request from Regional Growth NSW Development Corporation (NSW RGDC) to service the new 4,800 hectare (ha) Parkes SAP, located approximately 3km west of Parkes. SAPs are dedicated areas identified by the NSW Government to bring together planning and investment to drive jobs and economic activity. Situated at the only junction of Australia's two rail spines, the Inland Rail and the Trans-Australian Railway, the Parkes SAP will become an inland port, transferring export-ready goods to every major city and freight centre in Australia. It will build on already-planned private and government investments, creating up to 3,000 jobs across a range of industries, including agriculture, freight and logistics, manufacturing, energy and resource recovery and transport (NSW RGDC, 2024).

In order to facilitate the connection of the Parkes SAP and improve local electricity infrastructure, Essential Energy is proposing to design, construct, operate and maintain a new section of high voltage electricity supply network, referred to as the Parkes Activation Precinct High Voltage Supply Project (PAP HVSP). An integral component of the new high voltage supply will be the construction and operation of a new 132/11kV ZS, proposed to be located off Brolgan Road, within Parkes Enterprise Sub-precinct of the broader Parkes SAP development site. High voltage electricity connection works will also include installation of approximately 8km of new high voltage (single circuit 132kV and dual circuit 132/66kV) powerline from connection points at Essential Energy's Quorn Park 132kV Switching Station (currently under construction) and TransGrid's existing Parkes 132/66kV Substation, to the new proposed Brolgan 132/11kV ZS. Together, the proposed new Brolgan ZS and high voltage powerline form the PAP HVSP (refer **Figures 1** and **2**).

The proposed new 132/11kV Brolgan ZS is the subject of this REF, prepared under Part 5, Division 5.1, of the Environmental Planning and Assessment Act 1979 (EP&A Act). Construction, operation and maintenance of the proposed new high voltage powerline, making up the other component of the PAP HVSP, will be subject to a separate REF prepared under Part 5, Division 5.1, of the EP&A Act. The separation was required to align with the construction schedules of early site preparatory activities and civil works associated construction activities for the new Brolgan ZS, while refinement of the alignment and design for the high voltage powerline was ongoing.

Figure 3 depicts the various components of PAP HVSP, while **Figure 4** confirms the proposal site subject to assessment in this REF.

Construction, operation and maintenance of the new 132/11kV Brolgan ZS, as an integral component of the PAP HVSP, will ensure the local electricity infrastructure meets the current and future needs for the new Parkes SAP. It will thereby support the development of a declared SAP, supporting regional jobs and economic activity, while minimising negative social and environmental impacts. The new ZS will also strengthen Essential Energy's existing electricity network in the broader area, as well as increase its capacity, which will help support future electricity connections.

The Proposal

The proposal comprises the construction, operation and maintenance of the Brolgan 132/11kV ZS. Together with a proposed new high voltage powerline (to be assessed separately), the proposal will support the master planned Parkes SAP development site, and strengthen Essential Energy's electricity network in the broader area.

The proposal involves the construction of a new 132/11kV ZS, within Enterprise Sub-precinct of the broader Parkes development site, and would include the following elements:

- Two transformer bays, and two new 132/11kV transformers
- Two 132kV feeder bays and four future 132kV feeder bays
- High voltage switchgear operating at 132kV and 11kV
- Three prefabricated buildings (control, battery and telecommunications and switch rooms)

- Control equipment
- Underground cabling and associated conduits
- Auxiliary equipment and structures, including lightning masts, fencing and driveways.

Project Alternatives

One option would be to refrain from undertaking any further development of the network in the area. The consequences of Essential Energy doing nothing is that there is insufficient capacity within the existing electricity supply network to meet the demand anticipated to be required by the Parkes SAP. The proposed Brolgan ZS is an integral component of the PAP HVSP, required to supply the Parkes SAP, and without the augmentation of high voltage supplies, additional electricity supplies at the distribution level are not possible. Due to Essential Energy's network licence obligations, the 'do nothing' option is not a viable alternative to the proposed new electricity supply to the Parkes SAP development, of which the proposed new 132/11kV ZS is a vital component.

In response to the connection request from NSW RGDC, plus several other new major customer connection requests in the Parkes region, Essential Energy has been considering and investigating several 132kV network augmentation options. For the Parkes SAP connection request Essential Energy has been working closely with NSW RGDC to ensure siting of the new Brolgan ZS within the overall Parkes SAP site was appropriate for both future distribution of electricity services within the new Precinct, and to avoid future land use conflicts. Several alternative options were canvassed, but ultimately it was decided that siting the new ZS in the Parkes Enterprise Sub-precinct of the broader Parkes SAP development site was most appropriate for the following reasons:

- Being most accessible to a new connection with the proposed new high voltage supply
- Being located on already heavily modified and disturbed land from historical land uses
- Being located on land not designated for future residential land use
- Being located on land above the 1% Annual Exceedance Probability (AEP) for flooding
- Being located away from land with more sensitive ecological and Aboriginal heritage values
- Access from newly upgraded Brolgan Road.

Statutory Planning and Legislation

Clause 2.44 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) applies to electricity transmission and distribution activities undertaken by an energy supply authority. Clause 2.44 states that development for the purpose of a transmission or distribution network may be carried out by or on behalf of an electricity supply authority or public authority without consent on any land, with additional requirements for land reserved under the *National Parks and Wildlife Act 1974*.

As the activity does not require development consent, Essential Energy is the designated determining authority. Additionally, whilst Essential Energy does not require development consent to undertake the proposed activity, it has an obligation under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to consider the environmental impacts of the activity.

Specifically, Essential Energy has a statutory obligation to examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of this activity. This REF has been prepared to facilitate the determination through consideration of the relevant factors specified in section 5.5 of the EP&A Act and clause 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg).

Environmental Impact Assessment

This REF has been prepared in accordance with Part 5, Division 5.1 of the EP&A Act to assess the environmental impacts associated with the construction, operation and maintenance of the proposed activity. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the project.

A number of potential environmental impacts associated with the project have been avoided or reduced to acceptable levels during the design development and assessment stages. However, the project may still result in some impacts including air quality (dust), noise, traffic, waste generation, and visual amenity during construction and operation, as outlined in **Section 6**. Management and mitigation measures to alleviate these impacts have been developed as part of this REF and would be implemented during construction and operation of the proposal. Cumulative impacts associated with all components of the PAP HVSP, and other nearby developments, have been considered. These impacts will be minimised and would not be significant.

Considering the assessment of the impacts detailed in this REF, it is concluded that the proposed activity is not likely to have a significant impact on the environment. On balance, the project is justified on the basis of supporting the Parkes SAP development site and strengthening Essential Energy's electricity network in the broader area, whilst minimising potential environmental impacts.

1. Introduction

1.1 The Proposal

This Review of Environmental Factors (REF) assesses the potential environmental impacts associated with the construction, operation and maintenance of the proposed Brolgan 132/11 kilovolt (kV) Zone Substation (ZS), located off Brolgan Road, approximately 8 kilometres (km) west of Parkes, New South Wales (NSW). The proposal forms part of a broader high voltage electricity connection services agreement for the Parkes Special Activation Precinct (SAP), which includes the construction of approximately 8km of single circuit 132kV and dual circuit 132/66kV powerline. The significance of impact has been determined and appropriate mitigation measures recommended.

1.2 Context and Justification of the Proposal

Essential Energy has received a connection request from Regional Growth NSW Development Corporation (NSW RGDC) to service the new 4,800 hectare (ha) Parkes SAP, located approximately 3km west of Parkes. SAPs are dedicated areas identified by the NSW Government to bring together planning and investment to drive jobs and economic activity. Situated at the only junction of Australia's two rail spines, the Inland Rail and the Trans-Australian Railway, the Parkes SAP will become an inland port, transferring export-ready goods to every major city and freight centre in Australia. It will build on already-planned private and government investments, creating up to 3,000 jobs across a range of industries, including agriculture, freight and logistics, manufacturing, energy and resource recovery and transport (NSW RGDC, 2024).

In order to facilitate the connection of the Parkes SAP and improve local electricity infrastructure, Essential Energy is proposing to design, construct, operate and maintain a new section of high voltage electricity supply network, referred to as the Parkes Activation Precinct High Voltage Supply Project (PAP HVSP). An integral component of the new high voltage supply will be the construction and operation of a new 132/11kV ZS, proposed to be located off Brolgan Road, within Parkes Enterprise Sub-precinct of the broader Parkes SAP development site. High voltage electricity connection works will also include installation of approximately 8km of new high voltage (single circuit 132kV and dual circuit 132/66kV) powerline from connection points at Essential Energy's Quorn Park 132kV Switching Station (currently under construction) and TransGrid's existing Parkes 132/66kV Substation, to the new proposed Brolgan 132/11kV ZS. Together, the proposed new Brolgan ZS and high voltage powerline form the PAP HVSP (refer **Figures 1** and **2**).

The proposed new 132/11kV Brolgan ZS is the subject of this REF, prepared under Part 5, Division 5.1, of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Construction, operation and maintenance of the proposed new high voltage powerline, making up the other component of the PAP HVSP will be subject to a separate REF, prepared under Part 5, Division 5.1, of the EP&A Act. The separation was required to align with the construction schedules of early site preparatory activities and civil works associated construction activities for the new Brolgan ZS, while refinement of the alignment and design for the high voltage powerline was ongoing.

Figure 3 depicts the various components of PAP HVSP, while **Figure 4** confirms the proposal site subject to assessment in this REF.

Construction, operation and maintenance of the new 132/11kV Brolgan ZS, as an integral component of the PAP HVSP, will ensure the local electricity infrastructure meets the current and future needs for the new Parkes SAP. It will thereby support the development of a declared SAP, supporting regional jobs and economic activity, while minimising negative social and environmental impacts. The new ZS will also strengthen Essential Energy's existing electricity network in the broader area, as well as increase its capacity, which will help support future electricity connections.

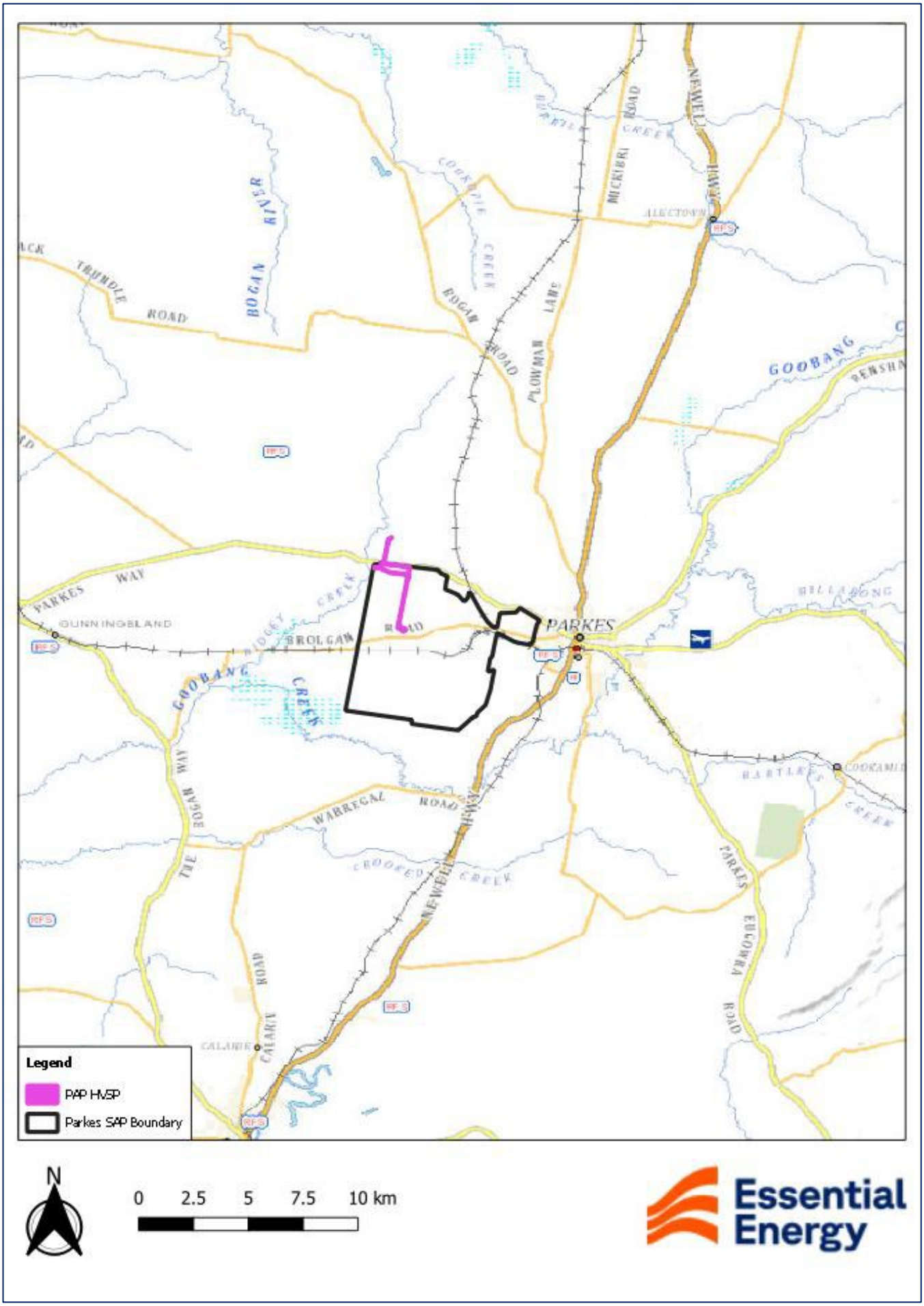

Figure 1: PAP HVSP in regional context

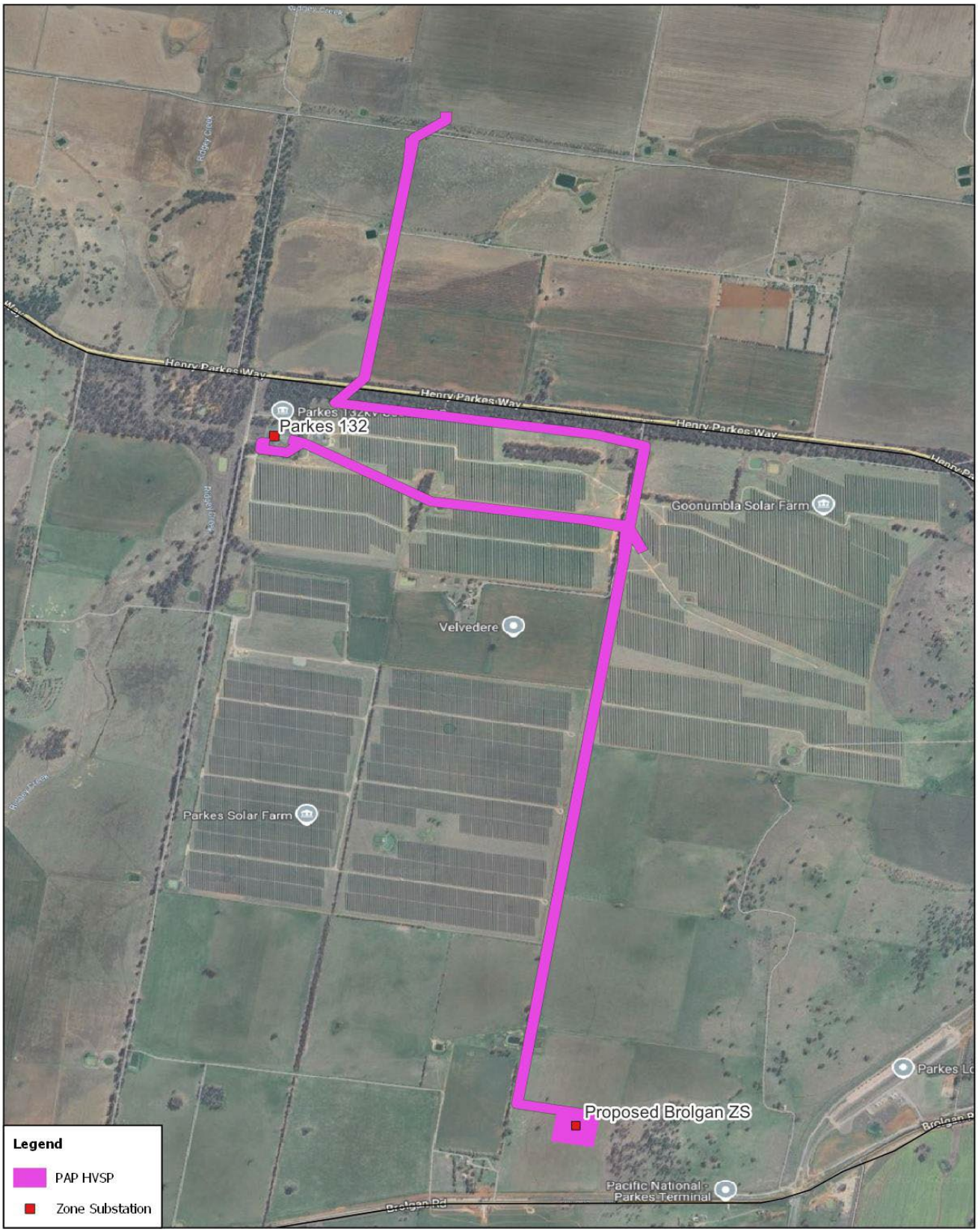

Figure 2: PAP HVSP in local context

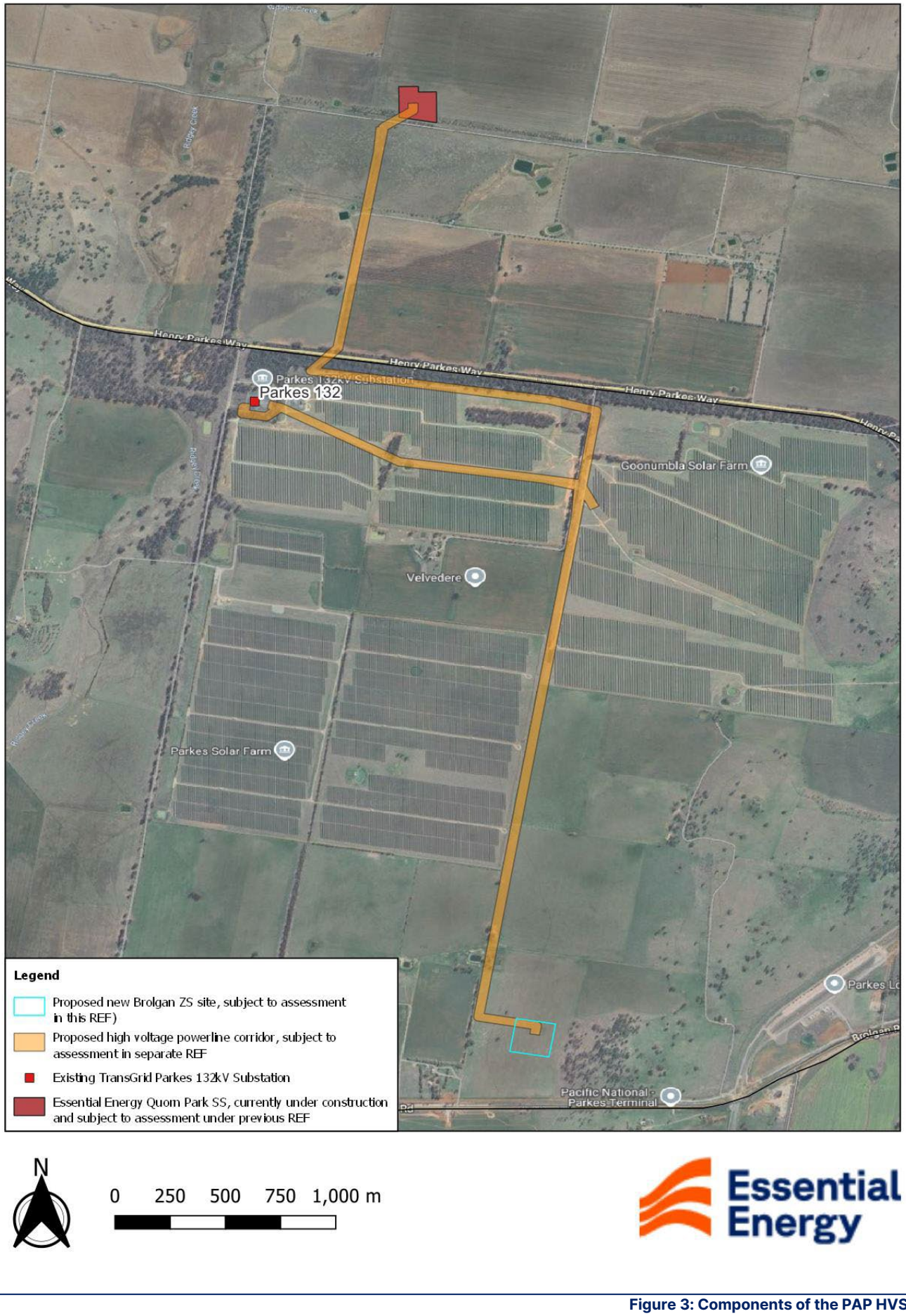

Figure 3: Components of the PAP HVSP

Figure 4: Proposal Brolgan ZS site subject to assessment in this REF

1.3 Network Investment Criteria

Network asset investment by Essential Energy is generally required to:

- Meet Essential Energy's duty of care
- Connect customers to the supply network
- Provide a satisfactory standard of supply to customers.

The overall performance of the network is driven by the reliability of individual network components and the redundancy provided by the network to enable maintenance of supply at times when critical parts of the network are out of service (due to maintenance or repair requirements). To maintain acceptable standards of customer service it is necessary to ensure:

- Infrastructure performance (reliability) is maintained at acceptable levels
- The network design provides adequate security (redundancy).

The reliability of equipment and infrastructure is managed through maintenance and replacement of that infrastructure and construction of new infrastructure. For Essential Energy, the decision to replace or construct new infrastructure is based on an assessment of equipment condition and consideration of the strategic needs of the network.

1.4 Proposal Objectives

The primary objective of the project is to design, construct, operate and maintain a new 132/11kV ZS, which as part of the PAP HVSP will service the new master planned Parkes SAP development site. The proposal will also strengthen Essential Energy's existing electricity network in the broader area. Secondary objectives associated with the project are to:

- Maximise social and economic benefits; and
- Minimise the environmental and social impacts.

1.5 Proposal Site

The proposed new 132/11kV Brolgan ZS site is located in the central west of NSW, within the declared Parkes SAP. The nearest population centre is Parkes, located approximately 8km to the east. The proposed new ZS site will be located off Brolgan Road, within the Parkes Enterprise Sub-precinct of the broader Parkes SAP development site (refer **Figure 5**). The new ZS site is currently located on land recognised as Lot 69 DP1299386. Ultimately, this lot will be subdivided into separate lots to accommodate future land uses, including the ZS, within the Parkes Enterprise Sub-precinct. The new ZS lot will be square in shape, measuring approximately 180m by 180m, encompassing approximately 32,400 square metres (m^2) or 3.24ha. It will accommodate all buildings, electrical plant, equipment and site drainage, forming "the proposal site" for the purposes of this assessment (refer **Figures 4**). A temporary access road will be constructed to the east of the proposed ZS lot, connecting to Brolgan Road to the south. It will initially be used as access to facilitate construction of the ZS, but will ultimately be constructed as a permanent new road as part of the subdivision works in the sub-precinct. Construction of the temporary access road is being undertaken by NSW RGDC, and will be subject to a separate environmental assessment. As such it does not form part of the proposal site being assessed in this REF.

Figure 4 shows the location of the proposal site in the context of the immediate surround landscape.

The proposal site is located within the Parkes Shire Local Government Area (LGA). The land is currently zoned REZ – Regional Enterprise Zone according to the "State Environmental Planning Policy (Activation Precincts) 2020 Parkes Activation Precinct Land Application Map", listed in *State Environmental Planning Policy (Precincts—Regional) 2021*.

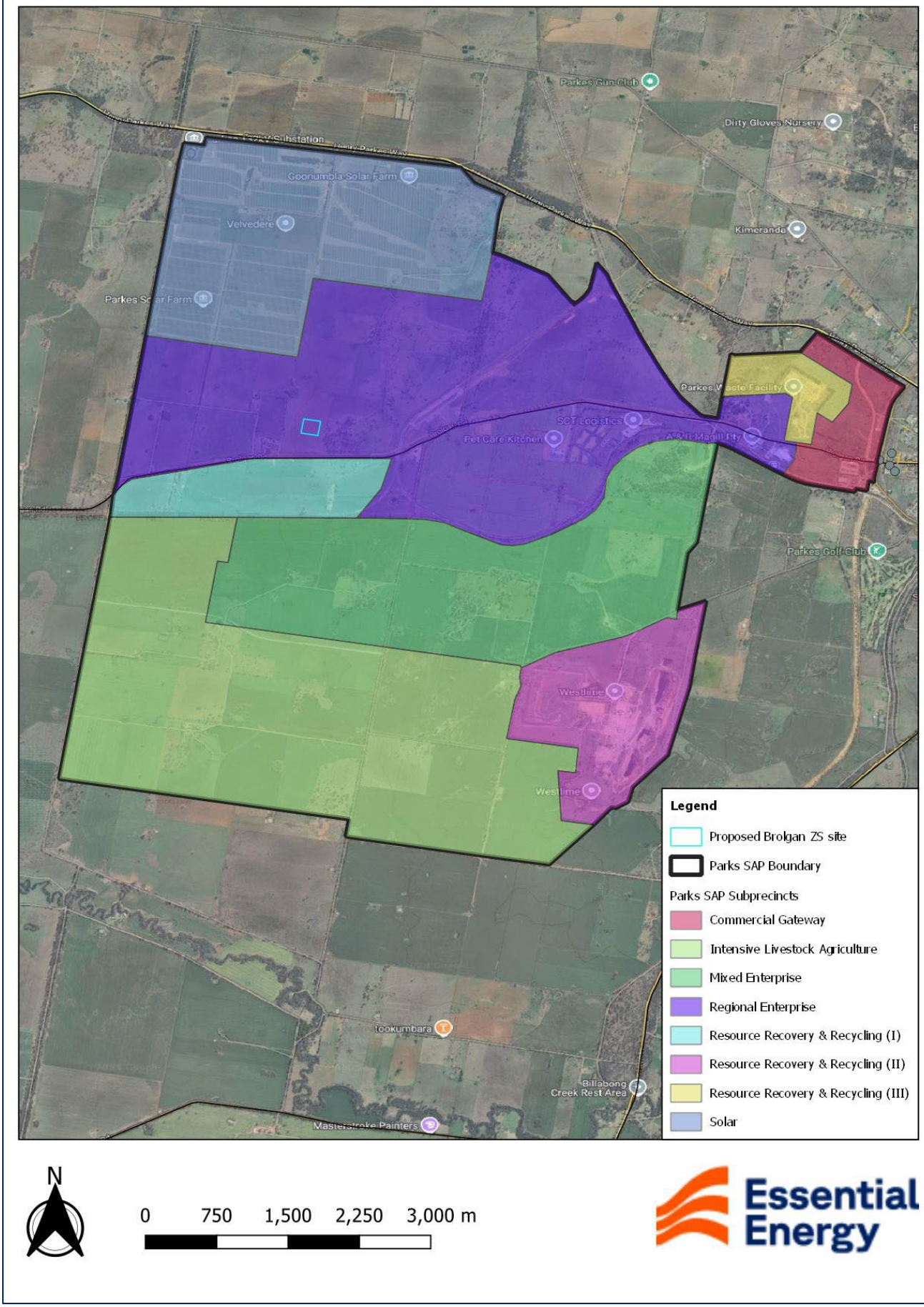

Figure 5: Proposal Brolgan ZS in the context of the broader Parkes SAP

The proposal site will be accessed via a new access road to be constructed from Brolgan Road to the south. This access road will ultimately become a formalised road as a part of subdivision within the Parkes Enterprise Sub-precinct of the broader Parkes SAP development site.

Site inspections undertaken by Essential Energy's Environmental Senior Specialist on 24 July and 17 September 2024 indicated the proposal site comprises of a heavily modified and cleared farm paddock, with only groundcover species present, dominated by exotic pasture grasses and weeds, with limited native species. Historic disturbance is likely to also have include ploughing, as evidenced by soil disturbance and cultivated grass species. The proposal site has been cleared of all woody vegetation. There are no trees or shrubs present (refer **Plates 1** and **2**).

Review of the NSW State Vegetation Type Map (SVTM) (DPE, 2023) indicates that the proposal site is mapped as Plant Community Type (PCT) 0 – not classified (refer **Figure 10**). Further review and assessment of the vegetation types present at, and nearby the proposal site, as well as potential impacts on threatened species, communities and their habitats, is provided in **Section 6.5**

The surrounding existing land uses were noted to comprise:

- **North**: Cleared farmland immediately north, with Goonumbla Solar Farm, Henry Parkes Way and predominately cleared farmland further north beyond
- **East**: Cleared farmland immediately to the east, with partially vegetated farmland rising into rounded hills, a railway and Brolgan Road further east beyond
- **South**: Cleared farmland immediately to the south, with Brolgan Road and predominately cleared farmland and a railway further south beyond.
- **West**: Predominately cleared farmland immediately to the west, with a strand of semi mature trees and predominately cleared farmland further west beyond.

The closest sensitive receivers are two rural premises (R1 and R2) located approximately 370m and 390m southwest of the proposal site, respectively, on the northern side of Brolgan Road. A third (R3) is located approximately 540m southeast of the proposal site on the southern side of Brolgan Road. These are shown in **Figure 7.**

The closest named waterway is Ridgey Creek, located approximately 2.6km northwest of the proposal site at its closest point (refer **Figure 9**). There are several farm dams located in all directions in the general vicinity of the proposal site, the closest being approximately 290m northwest. Current drainage at the proposal site would be expected to follow overland flow to the west. Once constructed, the proposal site would have its own internal drainage.

1.6 Study Area

The broader study area includes the predominately cleared, rural and partially vegetated areas, rural properties and existing road and powerline infrastructure in the general vicinity of the proposal site. Sensitive environmental areas within the broader region include waterways, wetlands, areas with biodiversity values, Aboriginal and non-Aboriginal heritage, and other environmental values, that form part of the immediate surrounding landscape.

1.7 Purpose of the REF

The purpose of this REF is to document the assessment of potential environmental impacts of the proposal, and identify if there are likely to be any significant environmental impacts. It informs Essential Energy's determination of the proposal under Part 5, Division 5.1 of the EP&A Act.

Plate 1 View from near centre of the proposal site looking northwest towards remnant, partially vegetation land on rolling hills to the east. The photo shows the cleared nature of the proposal site with ground cover only comprising a mixture of predominately exotic pasture grasses and weeds

Plate 2 View from near the western boundary of the proposal site looking south towards Brolgan Road, showing areas of soil disturbance and evidence of historic ploughing

2. Description of the Proposal

2.1 Scope of Works

The proposal includes the construction and operation of a new 132/11kV ZS, within an approximately 180m by 180m parcel of land (3.24ha).

A preliminary site layout for the proposed ZS is provided in **Figure 6**. Further detail is provided in the civil, and building design plans (**Appendix A**).

2.1.1 SITE ESTABLISHMENT

Site establishment works include:

- Installation and maintenance of erosion and sediment control measures
- Arrangement of suitable builder's power and water supply to site
- All vegetative matter to be cleared, grubbed and removed from ZS bench area, strip topsoil and stockpile.

2.1.2 CIVIL WORK

The civil works include:

- Bulk earth works to create ZS bench
- Excavation work for building, transformer bays, electrical equipment, lightning masts and security fence footings
- Excavation and trenching work for installation of underground conduits and cables
- Excavation for installation of site drainage, including stormwater pipes and pits
- Excavation for installation of earth grid

2.1.3 BUILDING WORK

Three prefabricated buildings will be installed at the proposed ZS site:

- Control room
- Battery and telecommunications room, with amenities
- Switchroom

Building works associated with the installation of these buildings include:

- Foundations, concreting and blockwork
- Structural reinforcing
- Installation of power and lighting systems
- Installation of air conditioning systems
- Installation of fire protection systems
- Installation of security systems
- Installation of conduits, paths and all finishes as per design drawings.

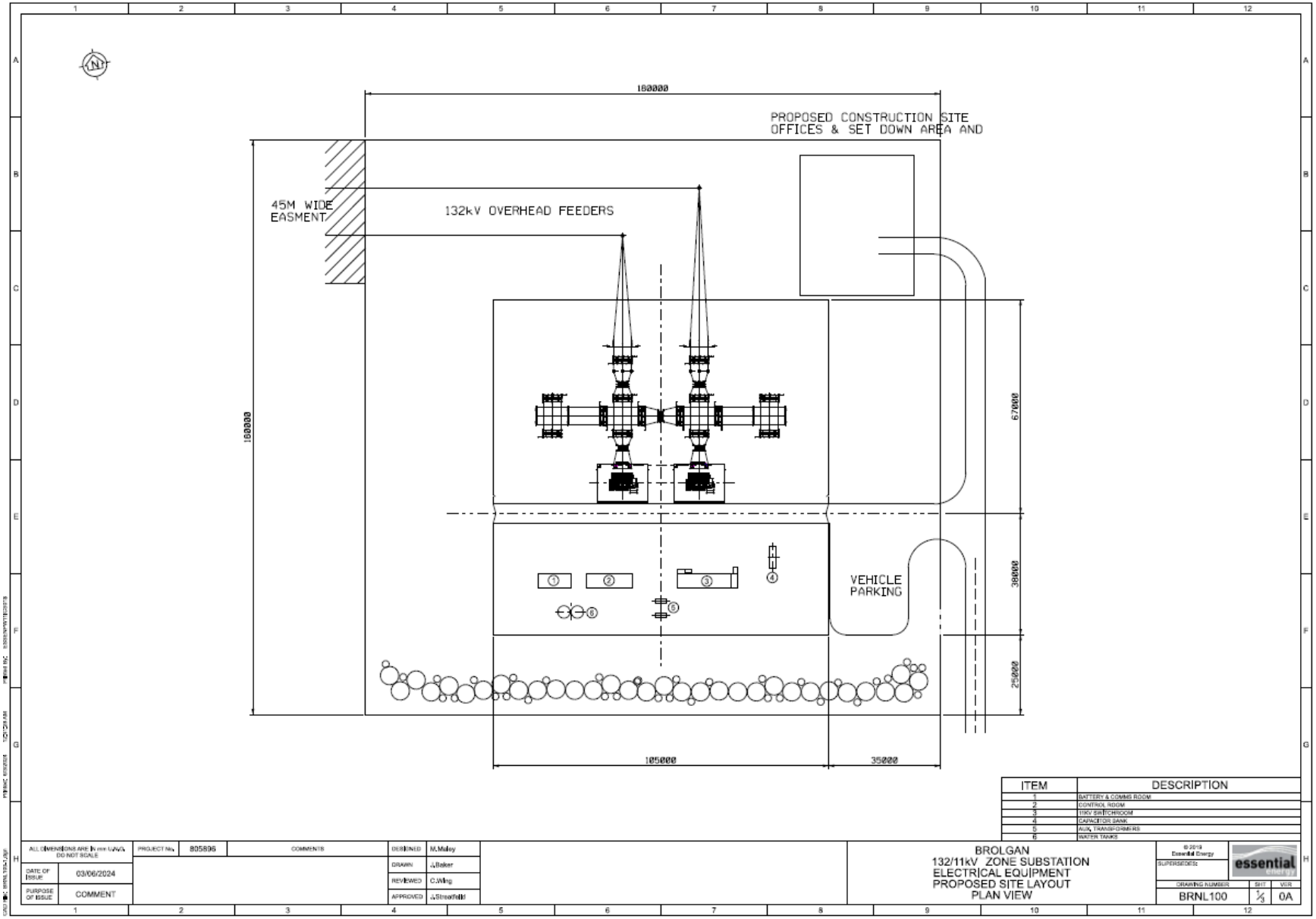

Figure 6: Brolgan ZS Preliminary Site Layout

2.1.4 UNDERGROUND CONDUIT

Installation of all conduits as per design drawings.

2.1.5 ELECTRICAL WORK

1 x 132kV Feeder Bay to Transgrid, each bay includes:

- 1 x 132kV OH Conductor termination structure
- 1 x 132kV dead tank circuit breaker
- 3 x 132kV voltage transformers
- 2 x 132kV isolators with earth switches per isolator
- 3 x 132kV surge divertors
- Associated bus/cable support structures and bus work
- 1 x duplicate line diff feeder control/protection panel
- Secondary control cabling.

1 x 132kV Feeder Bay to Quorn Park, each bay includes:

- 1 x 132kV OH conductor termination structure
- 1 x 132kV dead tank circuit breaker
- 3 x 132kV voltage transformers
- 2 x 132kV isolators with earth switches per isolator
- 3 x 132kV surge divertors
- Associated bus/cable support structures and bus work
- 1 x duplicate line diff feeder control/protection panel
- Secondary control cabling.

4 x Future 132kV Feeder Bays, each bay includes:

- 1 x 132kV Bus isolator with 1 earth switches per isolator.

1 x 132kV Bus Section Circuit Breaker:

- 1 x 132kV dead tank circuit breaker
- 2 x 132kV isolators with 2 earth switches per isolator
- Associated bus/cable support structures and bus work
- 1 x Duplicate control/protection panel
- Secondary control cabling.

2 x 132kV Main Bus Sections, each section includes:

- 100mm x 4mm Aluminium tube and selenium conductor (61/3.25 AAAC) - 2/PH bus.
- Associated bus support structures and fittings.
- Bus Isolators as per BRNE904-1.
- Duplicate Bus Bar protection.

2 x 132/11kV Transformer Bays, each bay includes:

- Install new 132/11kV 30/45MVA power transformer.

- Associated bus/cable support structures and bus work.
- 3 x 630mm2 CU 11kV cables per phase.
- 1 x duplicate transformer control/protection panel
- Secondary control cabling.

11kV 2500A Switchboard:

- 2 x 11kV 2500A incomer circuit breakers
- 1 x 11kV 2500A bus section circuit breaker
- 15 x 11kV 630A feeder circuit breakers
- 1 x 11kV 630A capacitor bank circuit breaker
- Single Bus Bar protection

11kV feeder cable terminations:

- Termination and testing of new 11kV feeder cables.

Secondary Systems:

- 2 x 110v Battery systems.
- Duplicate 110/48v DC/DC convertors and associated equipment.
- SCADA.
- Telecommunications systems to suit a Type 1 AEMO monitored substation.

2.1.6 STAGING AREAS

The designated ZS lot will house all the construction equipment and stockpile area required for the activity.

The design plans presented in **Appendix A** provide an overview of the proposed works.

2.2 Design Criteria

The proposed new 132/11kV ZS will be primarily constructed to form a component of the PAP HVSP required to facilitate power supply to the new Parkes SAP development site and strengthen Essential Energy's existing electricity network in the broader area.

Siting of the proposed ZS has been selected based on careful consideration to ensure the ZS is strategically located with the SAP to ensure optimal and efficient delivery of electricity distribution and minimise future land use conflicts. The design has also been sympathetic to the future surrounding building infrastructure by minimising direct views of certain pieces of electrical infrastructure from vehicle and pedestrian traffic along Brolgan Road. The design also avoids other sensitive and critical infrastructure within the immediate vicinity.

The design has been developed to meet the following criteria:

- Meet the design life requirements
- Be cost effective when assessed on a life cycle cost basis
- Be capable of being constructed cost-efficiently and within time constraints
- Provide durability and reliability of the intended function
- Minimise potential environmental impacts.

2.3 Building Code of Australia

Essential Energy's design standards for buildings and substations meet the requirements of the BCA where appropriate; and the relevant Australian standards (such as AS2067 2008 Substations and high voltage installations exceeding 1kV a.c.).

2.3.1 UTILITIES

Until such time that formal sewer and water connections are provided to the new Enterprise Sub-precinct, the proposed new ZS will need to be self-sufficient for water supply and wastewater services. As such, it is proposed to install rainwater tanks and an on-site wastewater system (i.e., a septic system) to service the new substation. At a future date, once water and sewer services are provided for the Parkes Enterprise Sub-precinct, it is likely a connection to these services will be facilitated.

2.3.2 FENCING AND SIGNAGE

Security of a substation is of paramount importance due to the extreme dangers which energised electrical equipment can pose to untrained individuals. Adequate security fencing will be provided. The fence will be designed in accordance with Essential Energy's zone substation security fencing requirements.

2.3.3 ACCESS AND PARKING

The proposal site will be accessed via a new access road to be constructed from Brolgan Road to the south. This access road is being designed and constructed by RGDC and will ultimately be a shared right of access for both the ZS and future lots created as a part of subdivision with the Parkes Enterprise Sub-precinct of the broader Parkes SAP development site.

Car parking will be provided within the substation yard. Given that the substation will be an unmanned facility, this will provide for sufficient off-street parking.

2.4 Construction Activities

2.4.1 TIMING AND WORK HOURS

Construction work is expected to commence in late 2024/early 2025, and take approximately 18 months to complete, weather dependant.

In considering the remote nature of the proposed ZS site location, being at least 370m away from the nearest sensitive residential receiver, work that has the potential to create audible noise at the nearest sensitive receiver, will be between 7am and 6pm Monday to Saturday. On occasions, works outside these hours may be undertaken where the following requirements are met:

- Neighbours (and other sensitive receivers) adjacent to the works or the local council or the Environment Protection Authority (EPA) have been notified; and
- The works are justified on the basis that they are emergency works, or, because of supply security network outages or construction limitations, it is deemed that the works can only be achieved outside these hours.

2.4.2 RESOURCES AND EQUIPMENT

The following equipment is likely to be used on site to complete the work:

- Excavator
- Backhoe
- Elevated work platforms (EWP)
- Trucks
- Concrete trucks
- Cranes
- Grader
- Roller
- Bulldozer
- Concrete pump truck
- Forklift
- Under borers
- Bobcat
- Water truck
- Trencher
- Cable trucks
- Light vehicles.

2.4.3 IMPACT MITIGATION

The mitigation measures as detailed in **Section 6** form part of the proposed activity and will be implemented, as required, as part of the construction and operational phases.

2.5 Operation and Maintenance Requirements

Once the project is constructed, periodic maintenance will be required. Regular inspections of the infrastructure will be undertaken to help identify defects and hazards such as damaged components and vandalism. The site will not accommodate staff or contractors on a permanent basis. Periodic collection of waste may be required.

Likely maintenance activities include:

- Vegetation maintenance around perimeter of new ZS
- General landscape maintenance within the new ZS site
- Regular inspection and maintenance of ZS equipment.

3. Consultation

3.1 Overview

Community consultation defines the processes we use to seek views or provide information about projects. The term consultation can describe processes ranging from simply delivering information to residents, community information displays, or holding meetings with community representatives designed to actively seek feedback from local communities into a particular project.

The population as a whole is more aware than ever of their social, environmental and economic needs. They want to know about what is planned for their area and how it would impact on them.

Incorporating community consultation as a key business practice is both a necessary and a desirable path for Essential Energy to take. It must be undertaken in good faith and be transparent in all activities.

Essential Energy has in place a policy for community consultation on all major projects. The policy ensures that the community is informed about proposed development, and that concerns and issues are taken into consideration.

Essential Energy has consulted extensively with NSW RGDC regarding the siting of the ZS, to ensure the location is fit for purpose and poses the least land use conflict with the broader Parkes SAP.

Landholder consultation regarding the overall PAP HVSP, in particular with the residents located along the Brolgan Road has commenced and is continuing. These residents would also be advised of the works schedule and provided with details of a site contact.

Essential Energy will continue to work closely with NSW RGDC on community relations and communications.

3.2 Consultation Requirements under the T & I SEPP

Under the EP&A Act, Essential Energy is the determining authority for certain developments defined under the T&I SEPP as being permissible without consent. While the nature of work being undertaken does not require council consent, Part 2.2, Division 1 of the T&I SEPP does provide consultation requirements with the local council where works are anticipated to impact upon council infrastructure, local heritage items, flood liable land and certain land within the coastal zone. In addition, consultation may be required with the State Emergency Service (flood liable land) and other specified public authorities in certain circumstances.

The proposed construction and operation of the new 132/11kV ZS will be limited to the designated lot for ZS site. The proposal site will include its own site drainage, and will likely require connection to the local stormwater system, which will ultimately be installed as part of subdivision works for the Parkes Enterprise Sub-precinct, however, this is unlikely to have a substantial impact on the stormwater system. The proposal site will initially be required to be self-sufficient for water supply and wastewater services. As such, it is proposed to install rainwater tanks and an on-site wastewater system (i.e., a septic system) to service the new ZS. At a future date, once water and sewer services are provided for the Parkes Enterprise Sub-precinct, it is likely a connection to these services will be required, however given it is an unmanned site, it will not result in any substantial impact to either. While some disruption to local roads may occur during the delivery of large plant and equipment, the works are considered to be minor and inconsequential and will not involve significant disruption of pedestrian or vehicle traffic. Consultation with the local council is therefore not triggered under clause 2.10 of the T&I SEPP.

The proposal site is not located within a mapped area of local heritage, according to Parkes Shire LEP. Consultation with the local council is therefore not triggered under clause 2.11 of the T&I SEPP.

The proposal site is not located on flood liable land (refer **Section 6.5.3**). Consultation with the local council or State Emergency Services (SES) is therefore not triggered under clauses 2.12 and 2.13, respectively.

The proposal site is not located within the coastal zone. Consultation with the local council is therefore not triggered under clause 2.14.

The proposal is not located on land, or adjacent to land, that would trigger consultation with other specified public authorities under clause 2.15 of the T&I SEPP.

The proposal is not a development type listed in clause 2.16(1) of the T&I SEPP, and therefore there is no requirement to consider *Planning for Bushfire Protection* guide.

In addition to consultation requirements, additional notification and approval requirements are outlined in **Table 2.**

4. Project Alternatives

4.1 Do Nothing (Maintain Current Supply Infrastructure)

One option would be to refrain from undertaking any further development of the network in the area. The consequences of Essential Energy doing nothing would be that there is insufficient capacity within the existing electricity supply network to meet the demand anticipated to be required by the Parkes SAP.

The proposed Brolgan ZS is an integral component of the PAP HVSP, required to supply the Parkes SAP, and without the augmentation of high voltage supplies, additional electricity supplies at the distribution level are not possible. Due to Essential Energy's network licence obligations, the 'do nothing' option is not a viable alternative to the proposed new electricity supply to the Parkes SAP development, of which the proposed new 132/11kV ZS is a vital component.

4.2 Project Planning Options

Essential Energy has been working closely with NSW RGDC to ensure siting of the new Brolgan ZS within the overall Parkes SAP site was appropriate for both future distribution of electricity services within the new Precinct, and to avoid future land use conflicts. Several alternative options were canvassed, but ultimately it was decided that siting the new ZS in the Parkes Enterprise Sub-precinct of the broader Parkes SAP development site was most appropriate for the following reasons:

- Being most accessible to a new connection with the proposed new high voltage supply
- Being located on already heavily modified and disturbed land from historical land uses
- Being located on land not designated for future residential land use
- Being located on land above the 1% Annual Exceedance Probability (AEP) for flooding
- Being located away from land with more sensitive ecological and Aboriginal heritage values
- Access from newly upgraded Brolgan Road.

5. Environmental Legislation

The following section addresses the regulatory and statutory context of the proposed activity including its definition, land use permissibility, and compliance with the relevant environmental planning instruments (EPIs).

5.1 Environmental Planning and Assessment Act, 1979 (EP&A Act)

The EP&A Act is the primary piece of legislation regulating land use planning in NSW. It provides the framework for the development of state and local planning instruments which, through their hierarchy, determine the statutory process for environmental impact assessment. Under the EP&A Act there are two distinct processes, which are:

- Part 4 - 'development' proposals which require consent, including state significant development; and
- Part 5, which regulates 'activities' and requires an approval by a determining authority (e.g. Essential Energy). Part 5 also includes an assessment pathway for state significant infrastructure.

The proposal can therefore proceed under Part 5, Division 5.1 of the EP&A Act, given the proposal:

- May be carried out without development consent
- Is not exempt development
- Would be carried out by a determining authority or requires the approval of a determining authority.

A determining authority, for the purposes of this activity, is defined in Part 5 of the EP&A Act to include, but not be limited to, a state-owned corporation within the meaning of the *State Owned Corporations Act 1989*. Essential Energy is listed as a state-owned corporation, and would therefore be the determining authority for the activity covered by this REF.

In accordance with state and local EPIs (described below), this REF has been prepared under Part 5, Division 5.1 of the EP&A Act to assess the possible environmental outcomes of the proposed activity. In determining the proposal and degree of impact, Essential Energy is required to consider Section 5.5 of the EP&A Act and clause 171 of the EP&A Reg which are summarised in **Section 9** of this REF.

In accordance with clause 171(4) of the EP&A Reg, Essential Energy is required to publish this REF on the NSW planning portal, as the capital value of the ZS will exceed $5 million, prior to the activity commencing.

5.2 Environmental Planning Instruments

EPIs regulate the permissibility to undertake an activity and the type of assessment process that is required. EPI's comprise state environmental planning policies, and local environmental plans (LEPs). EPIs that apply to this development are outlined below.

5.2.1 STATE ENVIRONMENTAL PLANNING POLICIES

5.2.1.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) enables the efficient delivery of new infrastructure. Subject to certain exemptions the T&I SEPP allows development for the purpose of an electricity transmission or distribution network to be carried out by or on behalf of an electricity supply authority or public authority without consent on any land.

Exemptions to this broad (on any land) application include developments which require Part 4 approval under *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) or

activities triggering designated development under *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazard SEPP) (refer below).

The proposed activity falls within the scope of the T&I SEPP as being permissible without development consent.

Consultation requirements under the T&I SEPP are addressed in **Section 3.2**, whilst notification provisions are detailed in **Table 2.**

5.2.1.2 State Environmental Planning Policy (Precincts—Regional) 2021

State Environmental Planning Policy (Precincts—Regional) 2021 (Precincts-Regional SEPP) was introduced on 1 March 2022. The Precincts-Regional SEPP facilitates a planning framework for special activation precincts in regional NSW, streamlining planning processes and guiding the delivery of the precincts. The Precincts-Regional SEPP requires a master plan and delivery plan to be finalised before development starts for each activation precinct. When preparing an application for development, the applicant must complete a strategic merit assessment step to obtain an Activation Precinct Certificate from NSW RGDC.

In relation to the Parkes Activation Precinct, Schedule 1, Part 4, Clause 11A of the Precincts-Regional SEPP states that the Chapter 2 of the T&I SEPP applies to land in the Parkes Activation Precinct, subject to the modifications set out in that clause. The proposed activity falls within the scope of the T&I SEPP as being permissible without development consent, and therefore does not require an Activation Precinct Certificate from NSW RGDC prior to undertaking the activity.

5.2.1.3 State Environmental Planning Policy (Resilience and Hazards) 2021

State Environmental Planning Policy (Resilience and Hazards) 2021 (R&H SEPP) provides provisions for land use planning within the coastal zone, and to manage hazardous and offensive development. It also provides a state-wide planning framework for the remediation of contaminated land and to minimise the risk of harm.

The proposal site is not located on land identified as coastal wetlands or littoral rainforest on the Coastal Wetlands and Littoral Rainforests Area Map, according to Resilience and Hazard SEPP. As the proposal is not seeking development consent, the provisions relating to hazardous and offensive development and contaminated land do not apply. Notwithstanding, the risk of potential contamination is assessed in **Section 6.8.**

5.2.1.4 State Environmental Planning Policy (Planning Systems) 2021

State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) identifies state or regionally significant development, state-significant infrastructure, and critical state-significant infrastructure. It also provides for consideration of development delivery plans by local Aboriginal land councils in planning assessment, and allows the planning secretary to elect to be the concurrence authority for certain development that requires concurrence under nominated state environmental planning policies.

Chapter 2 of the Planning Systems SEPP identifies land which is State Significant Development (SSD), State Significant Infrastructure (SSI), Critical State Significant Infrastructure (CSSI), and Regionally Significant Development (RSD). Clause 2.6(1) of the Plannings Systems SEPP declares development to be SSD, pursuant to section 4.36 of the EP&A Act, if:

(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and

(b) the development is specified in Schedule 1 or 2.

The proposal does not meet the development specified in Schedule 1 or 2, and is permissible without consent pursuit to the T&I SEPP, as discussed in **Section 5.3.1**. The proposal therefore does not meet the requirements to be declared SSD.

Clause 2.13(1) of the Planning Systems SEPP declares development to be SSI, pursuant to section 5.12(2) of the EP&A Act, if:

(a) the development on the land concerned is, by the operation of a State environmental planning policy, permissible without development consent under Part 4 of the Act, and

(b) the development is specified in Schedule 3.

Clause 2.14 also declares development to be SSI, pursuant to section 5.12(4) of the EP&A Act, if the development is specified in Schedule 4 of the Plannings Systems SEPP.

The proposal is permissible without consent under Part 5 (Division 5.1) of the EP&A Act and does not satisfy the criteria for SSI under Schedule 3 or 4 of the Planning Systems SEPP. The proposal therefore does not meet the requirements to be declared SSI.

Clause 2.15 of the Planning Systems SEPP declares development to be CSSI if the development is specified in Schedule 5 of the Planning Systems SEPP —

(a) may be carried out without development consent under Part 4 of the Act, and

(b) is declared to be State significant infrastructure for the purposes of the Act if it is not otherwise so declared, and

(c) declared to be critical State significant infrastructure for the purposes of the Act

The proposal does not meet the requirements to be declared CSSI.

Clause 2.19 declares development to be RSD, pursuant to section 4.5(b) of the EP&A Act, if the development is specified in Schedule 6, generally above a certain value and requiring development consent. The proposal does not require consent and therefore there is no basis to be declared to be RSD.

5.2.1.5 State Environmental Planning Policy (Biodiversity and Conservation) 2021

State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP), among other things, provides planning rules and controls for the clearing of native vegetation in NSW and the land use planning and assessment framework for koala habitat.

No vegetation clearing is proposed at the site, and while the provisions relating to Koala habitat do not apply to Part 5 assessments under the EP&A Act, potential impacts to Koalas has been considered in **Section 6.5**.

5.2.2 LOCAL ENVIRONMENTAL PLANS (LEPS)

LEPs are developed by councils (they become law only after Ministerial approval) and guide planning decisions for local government areas. According to the NSW Planning Group, now part of the NSW Department of Planning, Housing and Infrastructure (DPHI), LEPs, through zoning and development controls, allow councils to regulate the ways in which land is used. Council LEPs also list heritage items that are of local heritage significance.

The application of the T&I SEPP overrides the need to consider zoning controls, as electricity transmission or distribution network works are identified by the T&I SEPP as being permissible on any land without consent. However, the T&I SEPP provides consultation and notification provisions where activities are likely to substantially impact upon council-related infrastructure, or items of local heritage significance (refer **Section 3.2**).

5.3 Key Legislation

5.3.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (COMMONWEALTH) (EPBC ACT)

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance (NES). Approval from the Commonwealth is in addition to any approvals under NSW legislation.

The EPBC Act lists nine matters of NES which must be addressed when assessing the impacts of a project. An assessment of how the project may impact on matters of NES is provided in **Table 1**.

Table 1: Matters of National Environmental Significance

MATTER OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	IMPACT
World heritage properties	There are no world heritage properties proximate to the proposed development, or that would potentially be affected by the proposal
National heritage places	There are no national heritage places proximate to the proposed development, or that would potentially be affected by the proposal
Wetlands of international importance	There are no Ramsar wetlands proximate to the proposed development, and the proposal is not likely to have a significant impact on the ecological character of a Ramsar wetland.
Commonwealth listed threatened species and ecological communities	The proposal is not expected to have any significant impact on threatened species, populations or ecological communities listed within Commonwealth (or State) legislation (refer **Section 6.5**)
Great Barrier Reef Marine Park	The proposal would not result in any impacts to the Great Barrier Reef Marine Park
Commonwealth listed migratory species	The proposal is not expected to have an impact on listed migratory species (refer **Section 6.5**)
Nuclear action	The proposal would not result in any nuclear action, nor would the activity require any nuclear action to be undertake
Commonwealth marine areas	There are no Commonwealth marine areas proximate to the proposed development, or that would potentially be affected by the proposal
Impacts on water resources resulting from large coal mining and coal seam gas developments	The proposal is not related to any large coal mining or coal seam gas developments. The project would not impact on water resources

Given that the project would not significantly impact on matters of NES and would not be carried out on Commonwealth land, the EPBC Act is not triggered and approval from the Commonwealth Minister for the Environment is not required.

5.3.2 NATIVE TITLE ACT 1993 (COMMONWEALTH) (NT ACT)

The *Native Title Act 1993* (Cth) (NT Act) as validated by the *Native Title (New South Wales) Act 1994* was part of the Commonwealth Government's response to the High Court's decision in Mabo v Queensland, which found that Australian common law can recognise the rights and interests over land and water possessed by Indigenous people in Australia under traditional laws and customs – 'native title'.

The High Court rejected the doctrine that Australia was terra nullius (land belonging to no-one) at the time of European settlement and said that native title can continue to exist:

- Where Aboriginal and Torres Strait Islander people have maintained their connection with the land through the years of European settlement; and
- Where their title has not been extinguished by valid acts of Imperial, Colonial, State, Territory or Commonwealth Governments.

The decision does not give native title primacy over valid interests in land granted by governments. A validly granted freehold title would extinguish native title.

In relation to development on land subject to a successful native title claim or Indigenous Land Use Agreement, certain future acts are valid to the extent that they are ".....acts involving facilities for services to the public (section 24KA)....."

The native title holders and any registered native title claimants or parties to an Indigenous Land Use Agreement (ILUA), in relation to land concerned, have a procedural right for their interests to be considered. Therefore, where land is subject to native title or an Indigenous Land Use Agreement, they are required to be notified of the proposed "future act" and are entitled to have matters considered including their native title rights and interests in the land.

The proposal is not located on land subject to an application for, or determination of, native title or an ILUA, and therefore notification to native title holders and any registered native title claimants is not required under the NT Act.

5.3.3 BIODIVERSITY CONSERVATION ACT 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides the process for listing threatened species, threatened ecological communities, and areas of outstanding biodiversity value, and details the process for assessing impacts on those matters.

Section 1.7 of the EP&A Act requires that assessment of an activity must consider its impact on threatened species, threatened populations, and threatened ecological communities or their habitats in accordance with Part 7 of the BC Act. The assessment for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats, referred to in section 7.3 of the BC Act, determines whether the proposed works are likely to have a significant impact. If a significant impact is determined, a species impact statement (SIS) is required, or if the proponent so elects, a Biodiversity Development Assessment Report (BDAR) can be prepared.

The proposed ZS site is not located within a declared area of outstanding biodiversity value. The proposed activity will be carried out on predominately and highly disturbed land associated with previous farming practices. A significant impact on threatened species, populations, ecological communities, or their habitats as a result of the proposal is considered unlikely (refer to **Section 6.5**).

5.3.4 BIOSECURITY ACT 2015

The *Biosecurity Act 2015* (Biosecurity Act) provides for the prevention, elimination, minimisation and management of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers. Section 22 of the Biosecurity Act requires that any person who deals with biosecurity matter, or a carrier, and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing, has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised. This obligation is referred to elsewhere within the Biosecurity Act as the "general biosecurity duty".

Given the excavation and disturbance of surface and sub soils associated with the proposed activity, Essential Energy has a general biosecurity duty to ensure the biosecurity risks posed by the potential for the introduction of weed species are prevented, eliminated or minimised.

5.3.5 CROWN LAND MANAGEMENT ACT 2016

The *Crown Land Management Act 2016,* (Crown Land Management Act) consolidates several pieces of legislation, including the repeal of the *Crown Lands Act 1989, the Crown Lands (Continued Tenures) Act 1989, the Western Lands Act 1901* and certain other legislation. Existing leases, licences or permits issued under previous legislation will continue for its agreed term. From 1 July 2018, all new leases, licences and permits will be issued under the new legislation.

The proposal site is located within the Parkes SAP, on land owned by the NSW Government, but is not Crown Land. No lease or licence agreements are required from Crown Land.

5.3.6 ELECTRICITY SUPPLY ACT 1995

The *Electricity Supply Act 1995* (ES Act) establishes a comprehensive wholesale and retail market in electricity and regulates the network operations, wholesale trading, and electricity supply in the retail market. The ES Act confers special powers on Essential Energy in respect of development and maintenance of electricity infrastructure and sets out the licencing regime. In particular, it allows Essential Energy to trim and remove trees, carry out works on public roads, and acquire land.

The ES Act also requires that no works (other than routine repairs or maintenance works) may be carried out unless 40 days' notice has been given to the local council to make a submission in relation to the proposal. Any submission must be considered by Essential Energy.

5.3.7 HERITAGE ACT 1977

The *Heritage Act 1977* (Heritage Act) provides for the protection of heritage items of local and state significance. Such items may include places, buildings, works, relics, moveable objects, or precincts with historical, scientific, cultural or aesthetic value to the state. Where works are likely to impact upon an item listed on the State Heritage Inventory (SHI), approval may be required under two sections of the Heritage Act:

- Section 60 approval relating to impacts on items listed on the SHI; and
- Section 140 approval requiring an excavation permit for activities with potential to excavate or disturb a relic.

As described in **Section 6.7.2** there is no foreseeable likelihood that an item listed on the SHI would be impacted by the proposal, therefore further assessment and a permit from the Department is not required. Further discussion of potential impacts and measures to minimise impacts to items of local heritage significance is provided in **Section 6.7.**

5.3.8 LOCAL GOVERNMENT ACT 1993

The *Local Government Act 1993* (LG Act) implements a commitment made under section 51 of the NSW Constitution Act 1902 that requires the continuance of local government. The LG Act provides the legislative framework in which local councils operate, and encourages local participation in the affairs of local government.

Whilst the central focus of the LG Act is about the governance of local councils and the participation of the local community in its affairs, the LG Act also includes provisions for approval of certain works. In areas outside of the operation of the Sydney and Hunter Water Boards, local councils have the responsibility for the regulation of water supply, sewerage and stormwater drainage work.

According to section 68 of the LG Act, approval from local council is required for water supply work, sewerage work, and stormwater drainage work. Water supply work includes the extension of any pipes or fittings of any water services communicating or intended to communicate, directly or indirectly, with any water main of a council. Sewerage work includes not only works related to the sewer system, but also septic tank disposal systems.

Until such time that formal sewer and water services are provided to the new enterprise precinct, the proposed new ZS will need to be self sufficient in terms of water supply and wastewater services. As

such, the proposal will require installation of water tanks and an on-site wastewater system (i.e., a septic system). A section 68 approval will be required from the local council for the installation of an on-site wastewater system. At a future date a separate section 68 approval may be required for connection to the local water a sewerage reticulation networks.

5.3.9 LOCAL LAND SERVICES ACT 2013

The *Local Land Services Act 2013* (LLS Act), established Local Land Services, a government agency with the responsibility for providing advice on biosecurity, natural resources and agricultural advisory services in NSW. The LLS Act includes provisions for the regulation of native vegetation including the approval of certain activities.

Under the LLS Act, approval is required from the Minister for the Environment or delegate to clear native vegetation (exemptions apply). Exemptions include, but are not limited to, urban areas, electricity line maintenance and Part 5 activities under the EP&A Act.

The LLS Act is administered by the various local land services under delegated authority by the Minister for the Environment.

Given that the proposal will be assessed under Part 5, Division 5.1 of the EP&A Act, the provisions relating to the LLS Act are not applicable.

5.3.10 NATIONAL PARK AND WILDLIFE ACT 1974

The *National Parks and Wildlife Act 1974* (NPW Act) provides for the management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas and state game reserves. It also provides for the protection and care of native flora and fauna, and Aboriginal places and objects throughout NSW. Under the NPW Act it is an offence, without authorisation, to:

- Harm an Aboriginal object or place without consent;
- Pick or harm any plant or animal that is protected or is a threatened species, population or ecological community; or
- Damage any critical habitat, or habitat of a threatened species, an endangered population or an endangered ecological community or reserved land.

When an activity is likely to harm an Aboriginal object or place, approval under section 90 is required.

The NPW Act also serves to direct the management and protection of reserved land. In relation to utility installations, the Minister for the Environment may grant easements or rights of way through reserved land for the conveyance or transmission of electricity.

The proposal site is not located on reserved land. Approval under the NPW Act is not required in respect of the proposed activity.

As described in **Section 6.6.2**, based on the design, and mitigation measures, the proposal is not likely to impact upon Aboriginal objects.

5.3.11 PROTECTION OF ENVIRONMENT OPERATIONS ACT 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) provides a framework for the licencing of activities that have potential to result in pollution of the environment. The POEO Act is administered by OEH. An environment protection licence is not required for the proposed activities as they do not fall within Schedule 1 of the POEO Act; however, the following restrictions apply:

- The proposal must not pollute waters;
- Waste from the works must not be wilfully or negligently disposed of in a manner that harms or is likely to harm the environment;
- Waste must not be transported to a place that cannot lawfully be used as a waste facility for that waste;

- There must be no litter in or on a public place or an open private place caused by workers; and
- Any environmental incident that involves actual or potential harm to the health or safety of human beings or to ecosystems must be reported to the Environment Protection Authority (EPA).

During construction, there is the potential for discharge to surface waters from excavation, and trenching activities. A number of management strategies are available to Essential Energy for the discharge to surface waters, including discharging water over grassed or well vegetated areas away from waterways, or the use of filter bags in urban environments.

5.3.12 ROADS ACT 1993

The *Roads Act 1993* (Roads Act) provides for the ownership and management of public roads, and also requires the consent of the appropriate roads authority for various works in respect of certain public roads.

Section 138 of the Roads Act requires the consent of the appropriate roads authority for various works in respect of public roads and classified roads. Under Schedule 2 (5) (1) of the Roads Act Essential Energy is exempt from obtaining approval for works on or over an unclassified road other than a Crown road. However, works that require a connection to or crossing of a classified road must be approved by Transport for NSW (TfNSW).

The proposed activity will be limited to private property and connection to Brolgan Road. However, no work within, on, or over a classified road is required, therefore there is no requirement for a Section 138 approval from TfNSW.

5.3.13 WATER ACT 1912

Under the *Water Act 1912* (Water Act), for any temporary or permanent works not defined in a gazetted water sharing plan under the Water Management Act 2000 (WM Act), a licence or permit is required to:

- Extract water from a stream, river or water course via a pump or other work; or
- Extract groundwater via any type of bore, well, spear point or groundwater interception scheme (including dewatering).

The proposal site is located on land to which NSW Murray Darling Basin Fractured Rock Water Sharing Plan and Lachlan Unregulated and Alluvial Water Sharing Plan are in force. A licence or permit under the Water Act is therefore not required. Assessment of applicable licences, work or use approvals under the WM Act is provided in the following section.

5.3.14 WATER MANAGEMENT ACT 2000

The *Water Management Act 2000* (WM Act) governs the issue of new water licences and the trade of water licences and allocations for those water sources (rivers, lakes and groundwater) in NSW where water sharing plans have commenced. Under the WM Act, should water need to be extracted from a surface water or groundwater source, defined in gazetted water sharing plan, then four licence/approvals may apply, including:

- An access licence to obtain access to a share of the water source
- A water use approval to obtain permission for how the water would be used
- A water management works approval to obtain permission to install and use the works for water supply, drainage or flood mitigation work
- An activity approval, namely a controlled activity approval and/or aquifer interference approval.

The proposed activity would not trigger the need to obtain a water use approval or a water management works approval.

The proposal does not involve the taking of water from a surface water or groundwater source, however, a water licence is required whether water is taken for consumptive use or whether it is taken incidentally

by the aquifer interference activity. For example, dewatering of groundwater during building construction activity requires a water licence (unless an exemption applies) even where that water is not being used consumptively as part of the activity's operation.

The WM Act defines an aquifer interference activity as involving any of the following:

> *(a) the penetration of an aquifer,*
>
> *(b) the interference with water in an aquifer,*
>
> *(c) the obstruction of the flow of water in an aquifer,*
>
> *(d) the taking of water from an aquifer in the course of carrying out mining, or any other activity prescribed by the regulations,*
>
> *(e) the disposal of water taken from an aquifer as referred to in paragraph (d).*

An aquifer is defined as, *a geological structure or formation, or an artificial landfill, that is permeated with water or is capable of being permeated with water*.

A geotechnical investigation undertaken by Fortify Geotech (2024) identified that groundwater was not encountered in the eight boreholes established to a minimum depth of 1.3m below ground surface during geotechnical testing. Fortify Geotech (2024) indicated that permanent groundwater is not expected within at least 3m depth of existing ground surface levels. As such aquifer interference activity approval or water access licence is unlikely to be required.

A controlled activity approval confers a right on its holder to carry out a specified controlled activity at a specified location in, on or under waterfront land. Under the WM Act, a controlled activity means:

a) the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or

b) the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or

c) the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or

d) the carrying out of any other activity that affects the quantity or flow of water in a water source.

Waterfront land means—

(a) the bed of any river, together with any land lying between the bed of the river and a line drawn parallel to, and the prescribed distance inland of, the highest bank of the river, or

(a1) the bed of any lake, together with any land lying between the bed of the lake and a line drawn parallel to, and the prescribed distance inland of, the shore of the lake, or

(a2) the bed of any estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the estuary, or

(b) if the regulations so provide, the bed of the coastal waters of the State, and any land lying between the shoreline of the coastal waters and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the coastal waters,

where the prescribed distance is 40 metres or (if the regulations prescribe a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance. Land that falls into 2 or more of the categories referred to in paragraphs (a), (a1) and (a2) may be waterfront land by virtue of any of the paragraphs relevant to that land.

The proposal site is not located within 40m of waterfront land. Notwithstanding, in accordance with Section 41 of the *Water Management (General) Regulation 2018*, Essential Energy, a public authority, is

exempt from section 91E (1) of the WM Act in relation to all controlled activities that it carries out in, on, or under waterfront land. A controlled activity approval is therefore not required.

5.4 Summary of Licences, Permits, Approvals and Notifications

Specific approvals required for the construction, maintenance and operation of the proposal are outlined in **Table 2**.

Table 2: Summary of licences, Permits, Approvals and Notifications

LEGISLATION	AUTHORITY	REQUIREMENT
State Environmental Planning Policy (Transport and Infrastructure) 2021	Local Council and occupiers of adjoining land	21 days notification required for works involving new or existing substations. Essential Energy's Design Services will be responsible for this notification.
Electricity Supply Act 1995	Local Council	40 days notice of the proposed works must be given. Essential Energy's Design Services will be responsible for this notification.
Local Government Act 1993	Local Council	A section 68 approval will be required from the local council for the installation of an on-site wastewater system. At a future date a separate section 68 approval may be required for connection to the local water a sewerage reticulation networks

6. Environmental Assessment

6.1 Air Quality and Greenhouse Gases

6.1.1 EXISTING ENVIRONMENT

WSP (2019e) indicated the main industrial and non-industrial air emission sources contributing to the local airshed of the broader Parkes SAP development site include:

- Traffic using the local road network
- Freight and logistics operations
- Domestic fuel burning (gas, liquid and solid)
- Residential activities e.g. lawn mowers and barbecues
- Westlime milling and distribution centre (burning of fuels, heating of feed material, grinding and cooling).

These sources give rise to key pollutants including particulate matter of varying size fractions (PM10 and PM2.5) and emissions from fuel combustion.

The proposed Brolgan ZS site is situated on a cleared and highly disturbed landscape. Current land use and historic disturbance in the form of agricultural activities including cropping and grazing across the entire proposal site. The current influences on air quality in the locality are dust and vehicle emissions generated from agricultural activities and vehicle emissions from traffic movements on the Brolgan Road.

The closest sensitive receivers are two rural premises (R1 and R2) located approximately 370m and 390m southwest of the proposal site, respectively, on the northern side of Brolgan Road. A third (R3) is located approximately 540m southeast of the proposal site on the southern side of Brolgan Road. These are shown in **Figure 7**.

6.1.2 ASSESSMENT OF IMPACT

6.1.2.1 Air quality during construction

It is expected that during topsoil stripping and bulk earth works, including constructing the bench, as well as general excavation and trenching work, that there would be minor amounts of dust generated from the disturbance of soil, and wind erosion of any exposed surfaces and stockpiles. Dust also has the potential to be generated should vehicles transporting materials to site be uncovered.

There will be minimal exhaust emissions from vehicles. Exhaust emissions from construction equipment are likely to include nitrogen oxides (NOx), carbon monoxide (CO), sulphur oxides (SO_2), hydrocarbons, and total suspended particulates. All vehicles will be fitted with approved exhaust systems to maintain vehicle exhaust emissions within accepted standards.

Works will be limited to the proposal site itself. Impacts to air quality will be small in intensity, spread out over approximately months, and will be small in scope. It is unlikely that there will be an odour impact. Any impacts on air quality will be short-term and localised.

6.1.2.2 Air quality during operation

Once operational, the ZS will have negligible impacts on air quality. Ground surfaces exposed during construction will be stabilised, and gardening landscaping will ensure no dust is generated from open ground surfaces during the lifetime of the substation. All Essential Energy's assets are subject to regular maintenance and monitoring to ensure all equipment is operating effectively and are thus not generating odour or emissions.

Figure 7: Nearby sensitive receivers

6.1.3 ENVIRONMENTAL MITIGATION MEASURES

The following minimisation measures will be implemented to prevent air quality impacts:

- Any potential dust-borne materials transported to and from the activity site will be covered at all times during transportation
- Any exposed surfaces or temporary stockpiles of surplus excavated material will be covered or wet down during dry and windy conditions
- All vehicles and machinery will be maintained according to manufacturer requirements to ensure emissions are kept within acceptable limits.

6.1.4 CONCLUSION

The proposal is not anticipated to result in substantial or uncontrollable dust or exhaust emissions in the area during construction or operation. Any air quality impacts would be short-term and minor during construction or future maintenance. Given the mitigation measures outlined in this assessment the overall environmental risk is considered to be low.

6.2 Geology and Soil

6.2.1 EXISTING ENVIRONMENT

Reference to the NSW Geology Simplified layer, which can be viewed on the NSW Government's Central Resource for Sharing and Enabling Environment Data in NSW (SEED) website, indicates the proposal site is underlain by Quaternary colluvial deposits, comprising unconsolidated sediments that are found downslope from hills, formed by erosion of hills and by creep or sheetwash. According to the Parkes 1:100 000 Geological Sheet 8531, 1st Edition, 2000, the proposal site is also located within the Parkes Fault Zone, a zone comprising a northeast to southwest trending regional thrusts (WSP, 2019d).

Review of the Mitchell Landscapes Mapping V3 (Department of Environment, Climate Change and Water [DECCW] 2010a) indicates that the proposal site is located on the Goonumbla Hills Landscape comprising rounded low hills on Ordovician and Silurian sandstone, andesite, siltstone and phyllite with a partial blanket of Tertiary quartz gravels and sands. General elevation is 290 to 390m, with local relief of 70m. Soils are characterised by stony yellow earths on the sands, thin brown structured loams on the hills, merging with red-brown and red texture-contrast soils on the flats.

Figure 8 shows mapped Mitchell Landscapes relative to the proposal site.

The geotechnical investigation for the proposed ZS undertaken by Fortify Geotech (2024) indicated that subsurface conditions at the proposed ZS site comprises topsoil, underlain by natural alluvial soils. A summary of the subsurface profile is presented in **Table 3**.

Table 3: Summary of subsurface profile

GEOLOGICAL PROFILE	DEPTH (M)	UNIT	DESCRIPTION
TOPSOIL	0.0-0.1	Unit 1: Silty SAND	Silty SAND; fine to coarse sand, low plasticity silt, trace of grass roots & fine to medium gravel, dark brown, dry to moist, loose.
ALLUVIAL SOIL	0.1-0.6	Unit 2a: Sandy CLAY	Sandy CLAY; low to medium plasticity clay, fine to coarse sand, red-brown, dry to moist, stiff.
ALLUVIAL SOIL	0.6-refusal (1.1-1.3)	Unit 2b: Clayey SAND	Clayey SAND; fine to coarse sand, low to medium plasticity clay, trace of fine to medium sub-rounded to sub-angular gravel, brown, red-brown, dry to moist, dense to very dense.

Figure 8: Mitchell landscapes relative to the proposal site

6.2.2 ASSESSMENT OF IMPACT

The proposed works will involve site disturbance through bulk earthworks, which will include cut and fill, benching, excavations and trenching. It is estimated that approximately 2,730 cubic metres (m^3) of material will be cut to fill. An additional approximately 6,680m^3 of select material will be imported and compacted to create final ZS bench height.

These activities have the potential to impact on soil stability and erosion potential within the proposal site. The extent of these impacts will be restricted to the ZS site. With implementation of appropriate erosion and sediment control measures, the proposed activity is expected to have a low impact on soils and geology in the area.

Mitigation measures proposed to manage erosion and sedimentation are outlined in **Section 6.2.3**. Water quality impacts are discussed in **Section 6.3.2**, air quality impacts are discussed in **Section 6.1.2**, and contamination impacts are discussed in **Section 6.8.2.**

6.2.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be employed to manage erosion and sedimentation:

- Risks associated with sediment and erosion will be managed in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004). In particular, controls including, but not limited to the following, will be implemented:
  - Diversion of upslope runoff around the proposal site in a way that minimises erosion, to be developed prior to bulk earthworks
  - Sediment control fences or other measures shall be installed at the downslope perimeter of disturbed areas, including any temporary stockpiles.
  - Maintenance of all erosion control measures at operational capacity until land is stabilised.
- Disturbed areas will be progressively stabilised as soon as practicable following construction activities
- A site specific erosion and sediment control plan shall be included as part of the civil contractor's Construction Environmental Management Plan (CEMP)
- Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for any surplus excavated materials.

6.2.4 CONCLUSION

The proposal is not anticipated to have any adverse impacts on the soils and geology of the environment. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low. Further potential impacts to water quality are discussed in the following section.

6.3 Water quality and Hydrology

6.3.1 EXISTING ENVIRONMENT

The proposal site is within the broader Lachlan River catchment which forms part of the Murray Darling Basin. There are several farm dams and unnamed Strahler first order ephemeral waterways located in the general vicinity of the proposal site, the closest being a farm dam approximately 290m northwest. The closest named waterway is Ridgey Creek, a Strahler fourth order waterway, located approximately 2.6km northwest of the proposal site at its closest point. Goobang Creek, also a Strahler fourth order waterway, is also located approximately 6.2km south of the proposal site. Ridgey Creek is a tributary of Goobang Creek. Goobang Creek joins the Lachlan River at Condoblin, approximately 100 km west of Parkes.

Figure 9 provides an overview of waterways in the vicinity of the proposal site.

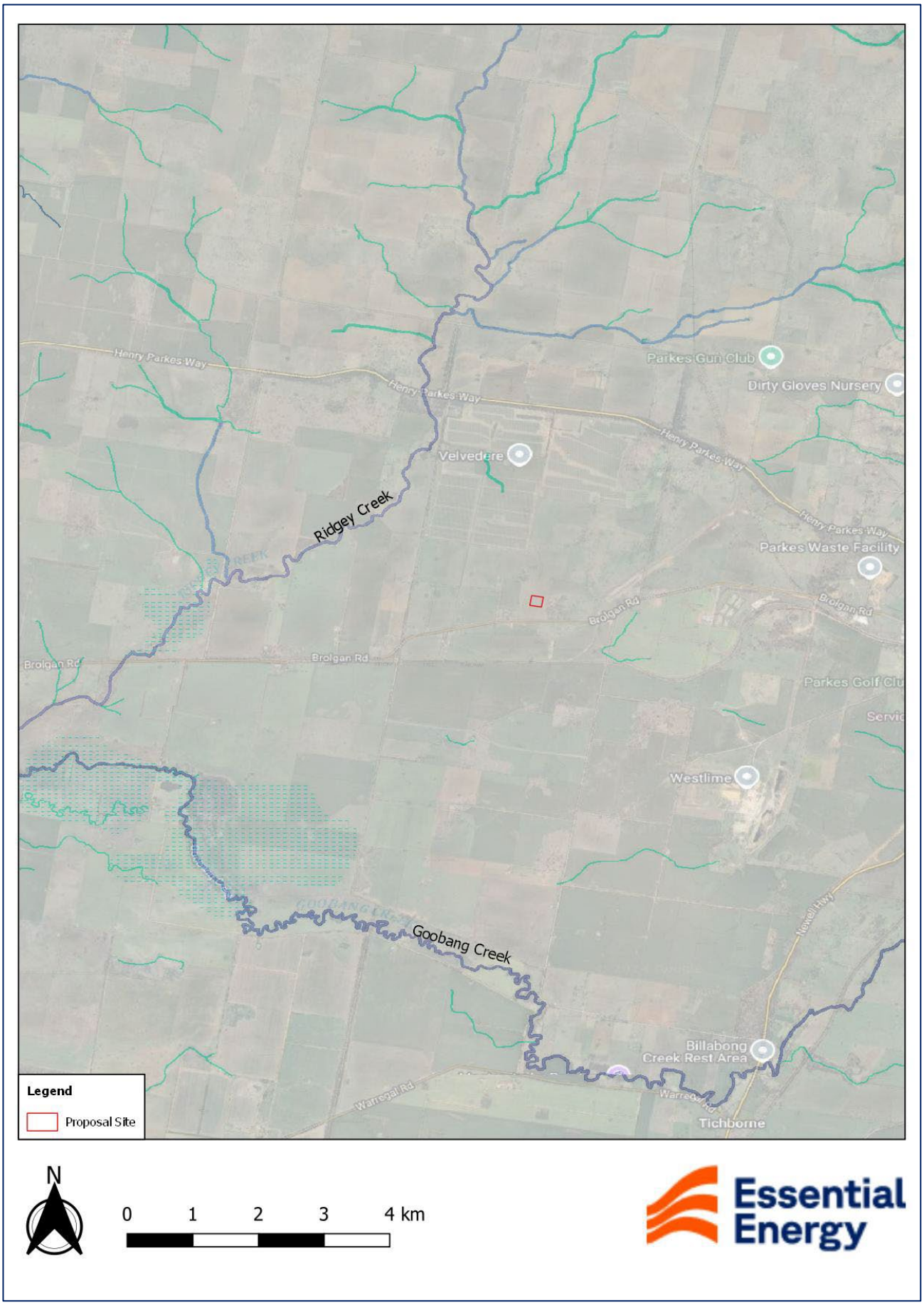

Figure 9: Waterways in the vicinity of the proposal site

WSP (2019d) indicated that drainage from the broader Parkes SAP is separated by the thrusted northeast to southwest trending geological ridge (North Parkes Volcanic Group) through the central portion of the SAP. Drainage from topography situated east and south of this ridge is by overland flow towards the south and southwest into Goobang Creek. Drainage from topography situated to the west and northwest is by overland flow towards the northwest and west into Ridgey Creek. Being situated generally west of this geological ridge, drainage at the proposal site would be expected to follow overland flow to the west and northwest towards existing farm dams and ultimately Ridgey Creek. Once constructed, the proposal site would have its own internal drainage.

Based on background information obtained from the Parkes 1: 100,000 geological map, along with NSW Governmental studies (CSIRO, 2008 & NSW DoI-W, 2012), WSP (2019d) inferred that the broader SAP contributes groundwater recharge into the Lachlan Fractured Rock groundwater source within the eastern portion and the Lachlan Unregulated and Alluvial Water Sources in the western portion of the SAP. The latter of which is where the proposed ZS site is located. WSP (2019d) inferred that regional groundwater flow is generally towards the west. However, locally, groundwater flow will generally follow the topography. Influences on flow within the water bearing zones of the Lachlan Unregulated and Alluvial will be related to the presence of bands (or lenses) of coarser sediments derived from alluvial sources. Paleochannels are present within the Lachlan alluvium and are typically associated with the Lachlan River further south within the Bland Catchment.

WSP (2019d) also indicated that groundwater flow paths and hydraulic connectivity are likely to be further influenced by the presence of faults that may act as hydraulic barriers or conduits. Groundwater flow is likely anisotropic (different horizontal and vertical flow rates), with vertical preferential flow paths aligned to the orientation of joints, faults and fractures. Groundwater exchange between the alluvium and the underlying fractured rock is expected to be insignificant in the context of a groundwater resource as the systems are not considered hydraulically connected (DoI-W, 2018).

WSP (2019d) found that groundwater recharge is primarily from rainfall and infiltration, particularly, Goobang Creek and Ridgey Creek, which are likely ephemeral (groundwater recharge zones). Preliminary assessment from available data suggests that the groundwater level within the broader SAP, is likely to be at depths below creek water levels (when present). It is anticipated that groundwater levels will be below 3.5 metres below ground level (mBGL) for regions close to Goobang Creek within the Lachlan Unregulated and Alluvial groundwater source, with groundwater depths likely increasing towards the north and northeast across the Parkes SAP. Groundwater levels within the Lachlan Fractured Rock groundwater source are expected to be at greater depths, between 40 mBGL – 80 mBGL. However, once the groundwater source is intersected, groundwater levels may rise within the bore to shallower elevations (WSP, 2019d).

Fortify Geotech (2024) indicated that groundwater was not encountered in the eight boreholes established to a minimum depth of 1.3m below ground surface during geotechnical testing. Fortify Geotech (2024) indicated that permanent groundwater is not expected within at least 3m depth of existing ground surface levels. However, temporary, perched seepages could be countered within the more pervious alluvial soils following rainfall.

Hydraulic modelling undertaken by WSP (2019g), for the broader Parkes SAP, indicates flood behaviour within and immediately adjacent to the SAP up to the 1% Annual Exceedance Probability (AEP) event is not affected by flooding in the larger Goobang Creek system to the south, and the flood behaviour within the broader SAP development site is therefore driven by local catchment rainfall runoff responses. In extreme events such as the 0.2% AEP and the PMF, the Goobang Creek system affects flood levels around the southern boundary of the broader SAP and within 200m of the southern boundary by causing elevated tailwater conditions in the local watercourses within the SAP. However, the influence of Goobang Creek flooding does not extend more than approximately 200m into the broader SAP development site even in very extreme events. The proposed Brolgan ZS is located outside the extent of the 0.1% and 0.2% AEP, and the PMF as mapped by WSP (2019g).

6.3.2 ASSESSMENT OF IMPACT

The following activities have the potential to impact on water quality during the construction and operation of the project:

- Earthworks, including benching, excavations and trenching
- Concreting works
- Fuel or oil leaks from construction and maintenance equipment

These activities have the potential to negatively affect the water quality in the area by the introduction of sediment laden runoff or contaminants within runoff. In consideration of the disturbance area being restricted to the proposed ZS site, and the location away from immediate receiving waterways, any potential impacts to surface water flows are likely be negligible. Similarly, the proposal is not expected to have an impact on the nearby farm dams, or the further downstream Ridgey and Goobang Creek systems.

Fortify Geotech (2024) stated that permanent groundwater is expected to be below expected excavation depths, though did note that temporary, perched seepages could be encountered within more pervious alluvial soils following rainfall.

The proposed Brolgan ZS is located outside the extent of the 0.1% and 0.2% AEP, and the PMF as mapped by WSP (2019g). The effects of climate change on the broader Parkes SAP were also considered by WSP (2019g) comparing the results of the 1% AEP event to those of the 0.2% AEP event The comparison demonstrated flood depths and extents are similar for both events, however, deeper and more extensive flooding for the 0.2% AEP event occurs within the broader SAP development site and on the Ridgey Creek and Goobang Creek systems downstream of the SAP. The proposed Brolgan ZS site is located outside the 0.2% AEP, and therefore unlikely to be impacted by larger flood events that may occur more frequently due to climate change.

6.3.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be applied:

- Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling
- Transformers will be housed inside appropriately bunded areas
- Disturbed areas will be managed in accordance with the requirements of the Blue Book to minimise potential impacts to waterways. Sediment fencing will be erected, where required, downslope of disturbed areas, and impacts would be minimised where practicable. The use of filter bags may be required to discharge collected sediment-laden water where there are insufficient grassed areas available
- Any water collected in excavations and trenches during rainfall and surface water ingress should be pumped to a grassed area on-site (where a suitable area is available) to allow for infiltration, reused for dust suppression, or pumped to stormwater using a sediment sock. All options should be conducted in a manner that does not result in turbid water entering the stormwater system or nearby waterway.

6.3.4 CONCLUSION

The proposal is not anticipated to have any impact upon the water quality or hydrological conditions in the area. Any impacts that might occur would be short-term and minor, and would occur during construction and maintenance. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.4 Noise and Vibration

6.4.1 EXISTING ENVIRONMENT

The proposal site is located in a rural environment. The main noise sources within the locality be:

- Road traffic noise from Brolgan Road
- Agricultural activities
- Train movements on the Main Western Railway
- Environmental noise such wind in vegetation and birdsong

The closest sensitive receivers are two rural premises (R1 and R2) located approximately 370m and 390m southwest of the proposal site, respectively, on the northern side of Brolgan Road. A third (R3) is located approximately 540m southeast of the proposal site on the southern side of Brolgan Road (refer **Figure 7**).

The existing noise environment at the proposal site would be characterised as a low noise environment.

6.4.2 ASSESSMENT OF IMPACT

6.4.2.1 Noise during construction

Noise impacts during construction may potentially disturb sensitive receivers near the ZS. The main sources of noise during the construction phase will be equipment needed for site works and the transportation and installation of electrical equipment. The following activities are likely to be the main sources of construction noise impacts:

- Site preparation and benching
- Vehicles and trucks transporting construction materials to and from the site
- Set up and movement of construction vehicles and equipment
- Alteration of traffic movements on surrounding roads.

Construction vehicles will use the local road network to access the proposal site. A new, temporary access road will be constructed to the east of the proposed ZS lot, connecting to Brolgan Road to the south. It will initially be used as access to facilitate construction of the ZS, but will ultimately be constructed as a permanent new road as part of the subdivision works in the sub-precinct. Construction of the temporary access road is being undertaken by NSW RGDC, and will be subject to a separate environmental assessment.

Given the duration of the works, surrounding land use, the open landscape, the nature of existing traffic movements and relatively low intensity construction methods, it is anticipated that construction activities will not substantially affect the ambient noise in the area. Works will predominantly be undertaken between Monday and Saturday between 7am and 6pm.

6.4.2.2 Vibration during construction

The use of construction equipment has the potential to cause some vibration impacts. The vibration generated from construction works would vary depending on the level and type of activity carried out at each site during each activity. Potential vibration impacts to receivers for the works would be dependent on separation distances, the intervening soil and rock strata, dominant frequencies of vibration and the receiver structure.

Dominant vibration generating plant include:

- Excavator
- Compactor/rollers
- Truck movements along unsealed roads

Given the distance from sensitive receivers and the relatively low intensity construction methods, there is not expected to be potential for cosmetic damage to residential dwellings.

6.4.2.3 Noise during operation

The proposal will include the installation of a new building housing high voltage switchboards, and two new outdoor 33/11kV transformers. Noise from the 132/11kV transformers has been conservatively estimated at 75dB(A) (worst case scenario with fans and pumps in operation).

Based upon the land use type of the local area, a background noise level of 30dB(A) has conservatively been adopted. As noted above, the nearest residential property to the proposal site is approximately 370m west, however the distance from the predominate noise generating equipment (i.e. the two 132/11kV transformers) is approximately 470m.

To determine the potential sound power level or 'noise' from the proposed ZS at the nearest sensitive receiver the following formula can be applied as per the EPA 2013:

SPL=SWL-20log10r-8, where:

- SPL is sound pressure level in dB(A)
- SWL is sound power level (noise source) in dB(A)
- r is the distance from the source to the measuring point

Based on this calculation, the estimated 75db(A) noise at the transformer source will be attenuated to a noise level of approximately 14dB(A) at the nearest receiving property, approximately 470m east of the proposed new 132/11kV transformers. This figure is 16 dB(A) under the noise goal for the surrounding land use. Given the agricultural buffer area between the proposal site and nearest receivers, the attenuation will, in reality, likely be greater.

The proposal site is situated within the Parkes Enterprise Sub-precinct of the broader Parkes SAP development site, which according to the Parkes Special Activation Precinct Master Plan is intended to support a wide range of compatible land uses and industries such as freight and logistics, advanced manufacturing and agribusiness. As such, it is assumed land use in this precinct will comprise future commercial, or industrial land use. The distance from the new 132/11kV transformers to the boundary with the future commercial / industrial lot is conservatively estimated at 80m. Using the same basic noise attenuation calculation, while adopting the worst-case noise emission at the source of the transformers (i.e., 75dB(A)), and 80m distance from future commercial/ industrial receptors, it is estimated that noise levels will be attenuated to approximately 29dB(A). This is still below the assumed current background noise level of 30dB(A), and well below the recommended commercial amenity noise level of 65dB(A), and industrial amenity noise level of 70 dB(A), adopted in the Noise Policy for Industry (EPA, 2017), which would apply in a future industrial / commercial setting.

6.4.2.4 Vibration during operation

The commissioning and operation of the ZS will not result in vibration causing activities.

6.4.3 ENVIRONMENTAL MITIGATION MEASURES

In considering the proposed ZS site location, the main operational noise generating activity (two 132/11kV transformers) will be at least 470m away from the current, nearest sensitive residential receiver, thus sufficient attenuation due to loss over distance is provided. Construction work that has the potential to create audible noise at the nearest sensitive receiver, will be between 7am and 6pm Monday to Saturday. On occasions works outside these hours may be undertaken where the following requirements are met:

- Neighbours (and other sensitive receivers) adjacent to the works or the local council or the NSW Environment Protection Authority (EPA) have been notified; and

- The works are justified on the basis that they are emergency works, or, because of supply security network outages or construction limitations, it is deemed that the works can only be achieved outside these hours.

Any future commercial or light industrial receivers located in close proximity to the proposal will be advised of the works schedule and provided with details of a site contact. All plant and equipment will be operated and maintained in accordance with the manufacturer's specifications. Any noise complaint will be investigated with additional control measures put in place if required.

6.4.4 CONCLUSION

The proposal will have acoustic and vibration impacts during construction and operation. The acoustic and vibration impacts during the construction phase will be medium term and moderate, whilst operational noise generated by the proposal will be negligible and unlikely to impact on the closest current of future sensitive receivers. Given the mitigation measures outlined in this assessment, the impacts can be effectively managed, and the overall environmental risk is considered to be low to moderate.

6.5 Flora and Fauna

6.5.1 EXISTING ENVIRONMENT

6.5.1.1 Desktop Assessment

Landscape Context

The proposal site is located on cleared, heavily modified and disturbed land, within the footprint of the broader SAP development site. The proposal site has been historically used for cultivation and grazing.

No permanent water courses are located on the proposal site. There are several existing farm dams and unnamed Strahler first order ephemeral waterways located in the general vicinity of the proposal site, the closest being a farm dam approximately 290m northwest. The closest named waterway is Ridgey Creek, a Strahler fourth order waterway, located approximately 2.6km northwest of the proposal site at its closest point. The proposal site is within the broader Lachlan River catchment which forms part of the Murray Darling Basin.

IBRA Bioregion and Subregion

The proposal site is located within the NSW South Western Slopes Interim Biogeographic Regionalised of Australia (IBRA), Lower Slopes subregion. Vegetation of the subregion includes Dwyer's Gum on granite, Red Ironbark on sedimentary rocks, Hill Red Gum, White Cypress Pine and Red Stringybark in the ranges. Grey Box Woodlands with Yellow Box, White Cypress Pine and Belah on lower areas. Poplar Box, Kurrajong, Wilga and Red Box in the north, limited areas of Bull Mallee, Blue Mallee, Green Mallee and Congoo Mallee in the central west. Myall, Rosewood and Yarran on grey clays, Yellow Box, Polar Box, and Belah on alluvial loams. River Red Gum on all streams with Black Box in the west with some Lignum and River Cooba.

Ecological Context

Plant Community Types

Review of the NSW State Vegetation Type Map (SVTM) indicates that the entire proposal site is mapped as Plant Community Type (PCT):0 – not classified (refer **Figure 10**). **Table 4** lists, and **Figure 10** illustrates the PCTs identified in the near vicinity (approximately 1,500m) of the proposal site.

Table 4: NSW SVTM PCTs mapped in the vicinity of the proposal site

PCT ID	PCT NAME	FORMATION	CLASS
0	Not Classified	-	-
45	Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	Grasslands	Riverine Plain Grasslands
76	Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Grassy Woodlands	Floodplain Transition Woodlands
267	White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	Grassy Woodlands	Western Slopes Grassy Woodlands

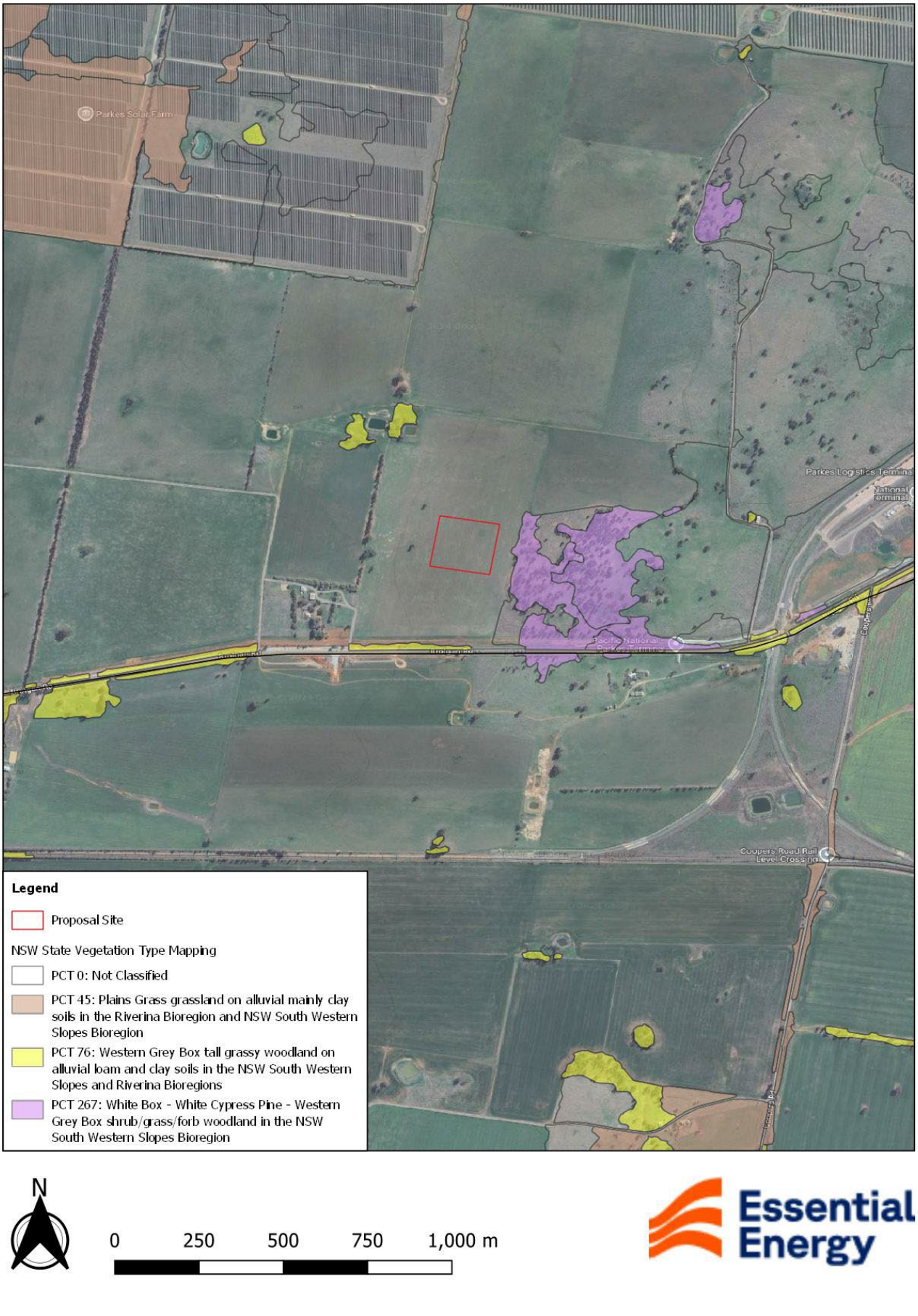

Figure 10: NSW State Vegetation Mapping showing PCTs relative to the proposal site

The biodiversity assessment completed by WSP (2019a) for the broader SAP site, which included ground truthed vegetation survey, mapped the more woody vegetation parts of the rolling hills immediately to the east, but outside, of the proposal site as PCT 267: White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion. The sparser woody vegetated patches of the rolling hills were mapped as PCT 250: Derived tussock grassland of the central western plains and lower slopes of NSW (refer **Figure 11**). WSP (2019b) considered these PCTs collectively to represent *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* Threatened Ecological Community (TEC), listed as endangered under the BC Act (NSW). No state or federally listed TEC's were mapped over the proposal site as part of the WSP (2019a) biodiversity assessment (refer **Figure 12**).

Paddock Trees

The biodiversity assessment completed by WSP (2019a) for the broader SAP site included a paddock tree assessment. The definition for Paddock Trees, taken from NSW Biodiversity Offsets Method (BAM), adopted for the broader SAP investigation area was:

- Trees which were located more than 50m away from any living tree that is greater than 20 centimetres (cm) Diameter at Breast Height (DBH)
- Trees in a group of three (3) or fewer living trees within 50m of each other, that in turn, are greater than 50m from the next living tree that is greater than 20 cm DBH
- During field surveys Paddock trees were visually inspected and measured to collect the following data:
  - the genus and species of each Paddock Tree
  - diameter at Breast Height (DBH)
  - presence of hollows
  - presence of Mistletoes
  - surrounding Plant Community Types.

PCTs were assigned to each paddock tree based on the species and proximity to identified PCT zones in the SAP investigation area or the dominant canopy species per the PCT description. The large tree benchmark from the assigned PCT was used to inform the Paddock tree class for each tree. Paddock tree classes include:

- Class 1: paddock trees that are =20 cm DBH and are trees that meet the definition of trees with negligible biodiversity (i.e. do not contain hollows).
- Class 2: paddock trees that are =20 cm DBH and less than the large tree benchmark for the most likely plant community type.
- Class 3: paddock trees that are greater than or equal to the large tree benchmark for the most likely plant community type.

No paddock trees were identified at the proposed ZS site. Paddock trees within the vicinity of the proposal site are shown in **Figure 13**.

NSW BioNet Records

A database review of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) BioNet database for threatened flora and fauna, was undertaken to identify any threatened species, populations, ecological communities or areas of outstanding biodiversity value that may be impacted by the proposal.

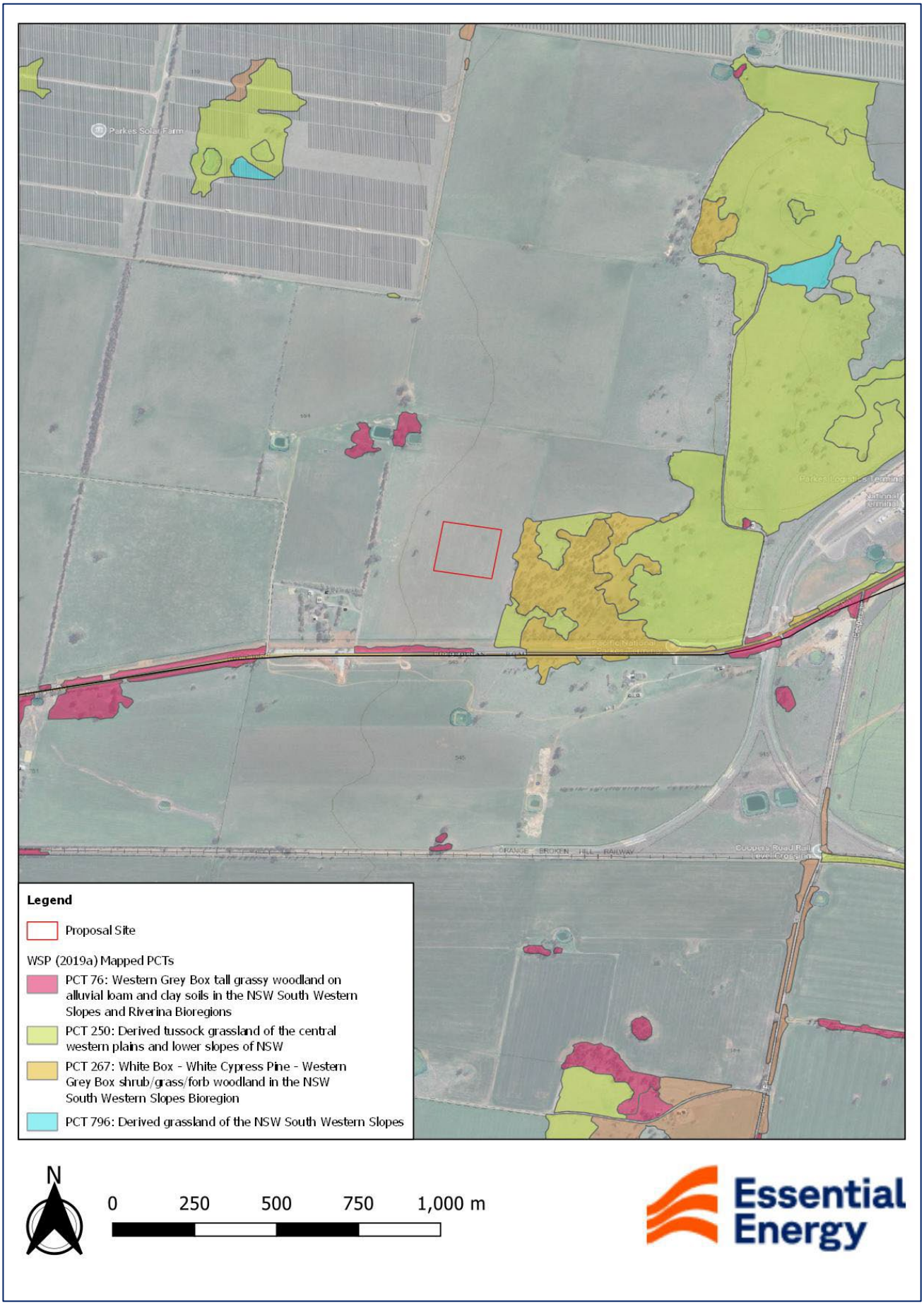

Figure 11: WSP (2019a) mapped PCTs relative to the proposal site

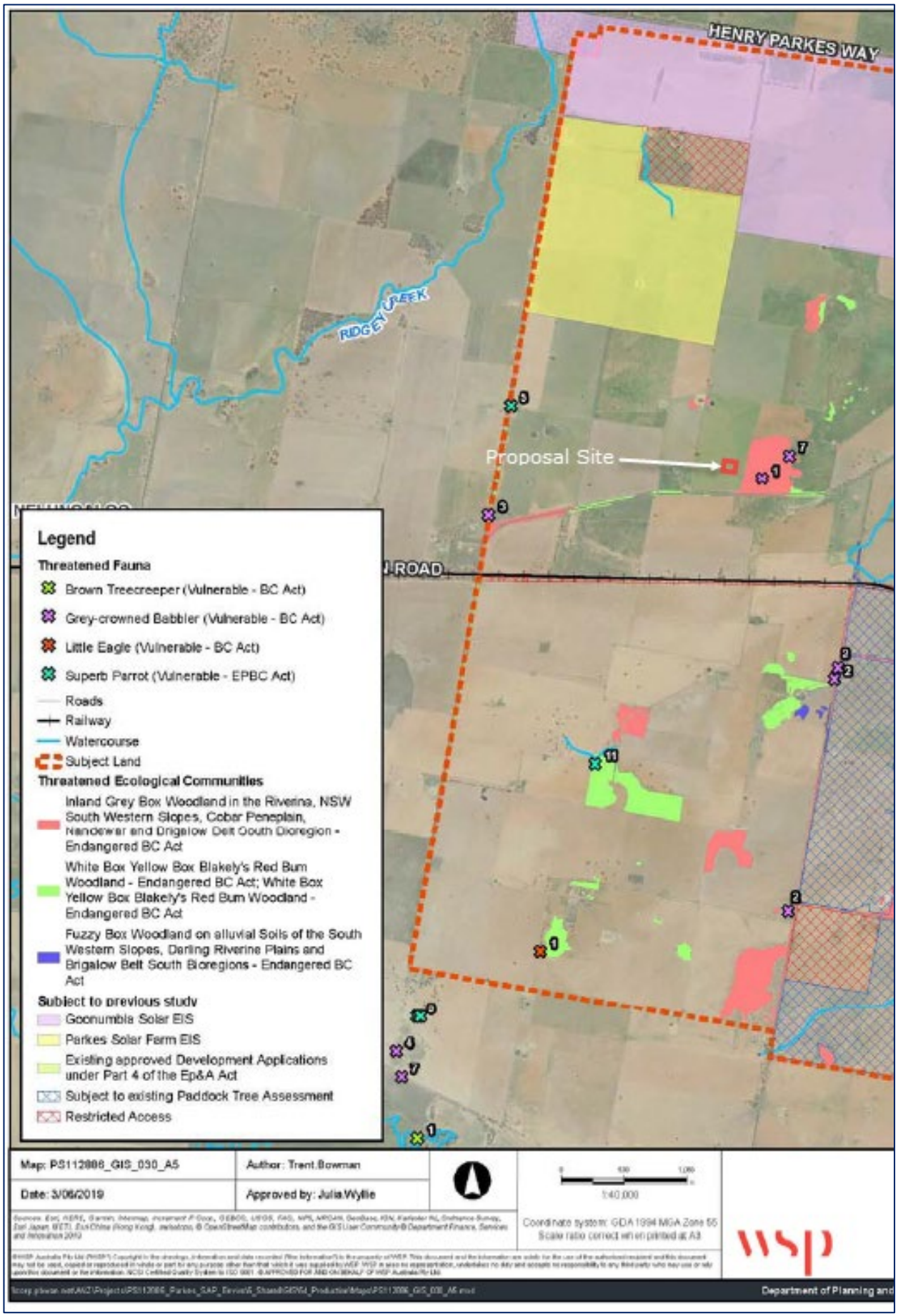

Figure 12: Threatened Biodiversity (WSP, 2019a)

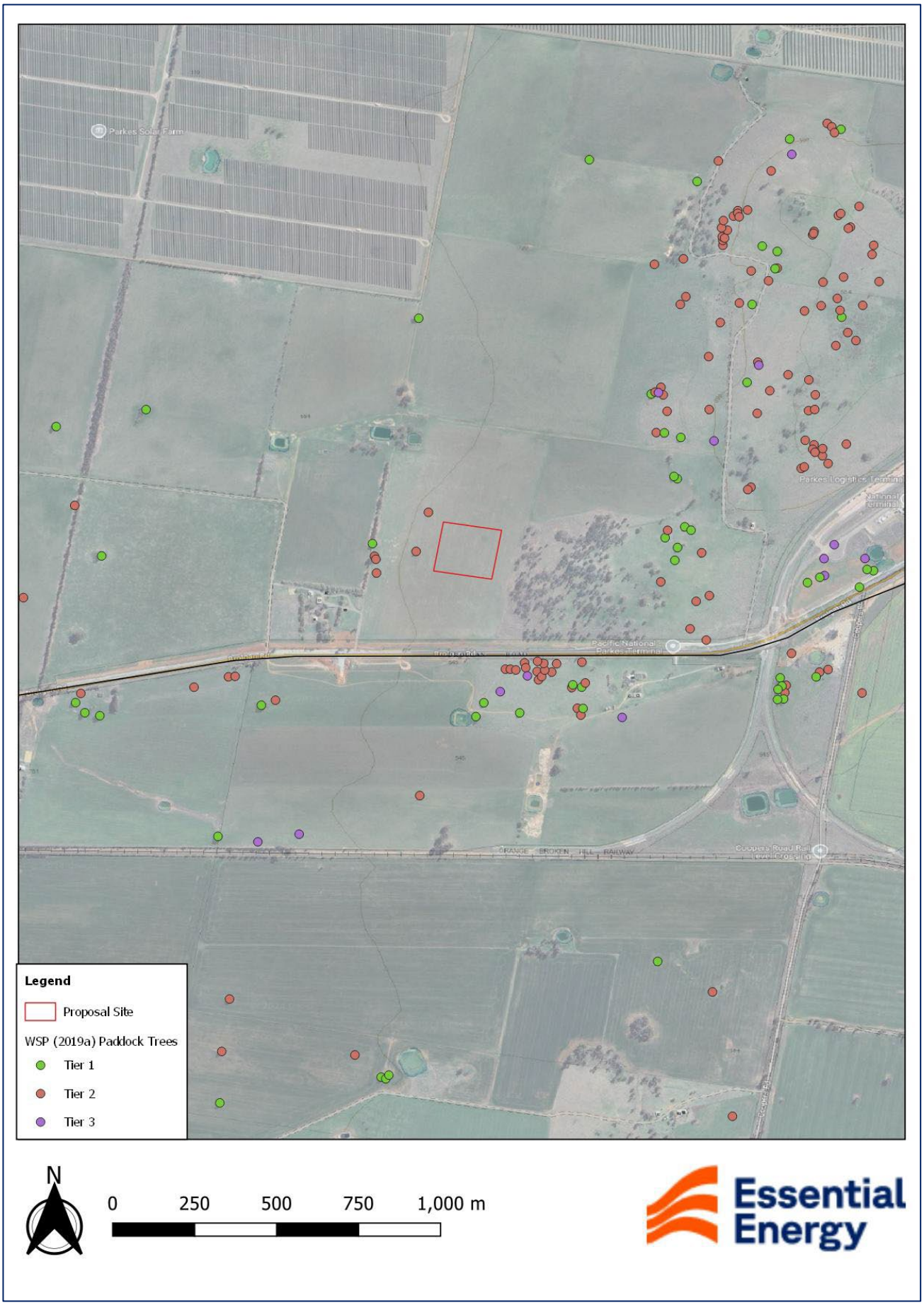

Figure 13: WSP (2019a) mapped Paddock Trees relative to the proposal site

According to the BioNet database there has been 137 recorded sightings of 29 threatened fauna species within a 10km buffer of the proposal site, as presented in **Table 5** below. An additional 24 threatened fauna species not recorded but having the potential to occur within the 10km buffer are detailed in the protected matters search (**Appendix B**). The nearest threatened fauna sighting, a *Pomatostomus temporalis temporalis* (Grey-crowned Babbler (eastern subspecies)), listed as endangered under the BC Act (NSW), was recorded approximately 234m southeast of the eastern boundary of the proposal site.

The BioNet database indicates there has been five records of two threatened flora species within a 10km buffer of the proposal site, as presented in **Table 6**. An additional seven threatened flora species not recorded but having the potential to occur within the 10km buffer are detailed in the protected matters search (**Appendix B**). The nearest threatened flora species, *Austrostipa wakoolica* (A Spear-grass), listed as endangered under both the BC Act (NSW), and EPBC Act (Cth) was recorded approximately 4.5km northwest of the proposal site and will not be impacted by the proposal.

Figure 14 illustrates the distribution of NSW BioNet threatened fauna and flora records within 10km of the proposal site.

Table 5: NSW Bionet threatened fauna species recorded within a 10km buffer of the proposal

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	EPBC ACT STATUS	NSW BIONET RECORDED SIGHTINGS
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	(blank)	1
Calidris acuminata	Sharp-tailed Sandpiper	-	C,J,K	22
Calidris ferruginea	Curlew Sandpiper	E4A	CE,C,J,K	2
Calidris ruficollis	Red-necked Stint	-	C,J,K	2
Chalinolobus picatus	Little Pied Bat	V	-	1
Chthonicola sagittata	Speckled Warbler	V	-	2
Circus assimilis	Spotted Harrier	V	-	4
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V	8
Daphoenositta chrysoptera	Varied Sittella	V	-	2
Epthianura albifrons	White-fronted Chat	V	-	2
Falco subniger	Black Falcon	V	-	4
Gallinago hardwickii	Latham's Snipe	V	V,J,K	8
Gelochelidon nilotica	Gull-billed Tern		C	2
Glareola maldivarum	Oriental Pratincole		C,J,K	1
Glossopsitta pusilla	Little Lorikeet	V	-	5
Hieraaetus morphnoides	Little Eagle	V	-	3
Hirundapus caudacutus	White-throated Needletail	V	V,C,J,K	1
Limosa limosa	Black-tailed Godwit	V	E,C,J,K	2
Ninox connivens	Barking Owl	V	-	2
Petroica phoenicea	Flame Robin	V	-	1

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	EPBC ACT STATUS	NSW BIONET RECORDED SIGHTINGS
Phascolarctos cinereus	Koala	E1	E	1
Polytelis swainsonii	Superb Parrot	V	V	13
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V		22
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	6
Stagonopleura guttata	Diamond Firetail	V	V	2
Stictonetta naevosa	Freckled Duck	V	-	5
Tringa glareola	Wood Sandpiper	-	C,J,K	2
Tringa nebularia	Common Greenshank	-	C,J,K	4
Tringa stagnatilis	Marsh Sandpiper	-	C,J,K	7
			Total	**137**

Notes:
E1 – Endangered (BC Act)
V – Vulnerable (BC and EPBC Act)
E – Endangered (EPBC Act)
E4A – Critically Endangered (BC Act)
CE – Critically Endangered (EPBC Act)
C – China-Australia Migratory Bird Agreement (CAMBA) (EPBC Act)
J – Japan-Australia Migratory Bird Agreement (JAMBA) (EPBC Act)
K – Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) (EPBC Act)

Table 6: NSW Bionet threatened flora species recorded within a 10km buffer of the proposal

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	EPBC ACT STATUS	NSW BIONET RECORDED SIGHTINGS
Austrostipa wakoolica	A spear-grass	E1	E	4
Swainsona sericea	Silky Swainson-pea	V		1
			Total	**5**

Notes:
E1 – Endangered (BC Act)
V – Vulnerable (BC and EPBC Act)
E – Endangered (EPBC Act)

EPBC Protected Matters

An EPBC Protected Matters Report (Commonwealth DCCEEW, 2024b) generated for this proposal considered Matters of National Environmental Significance (MNES) within a 10km buffer of the proposal. This report is provided in **Appendix B** and summarised in **Table 7.**

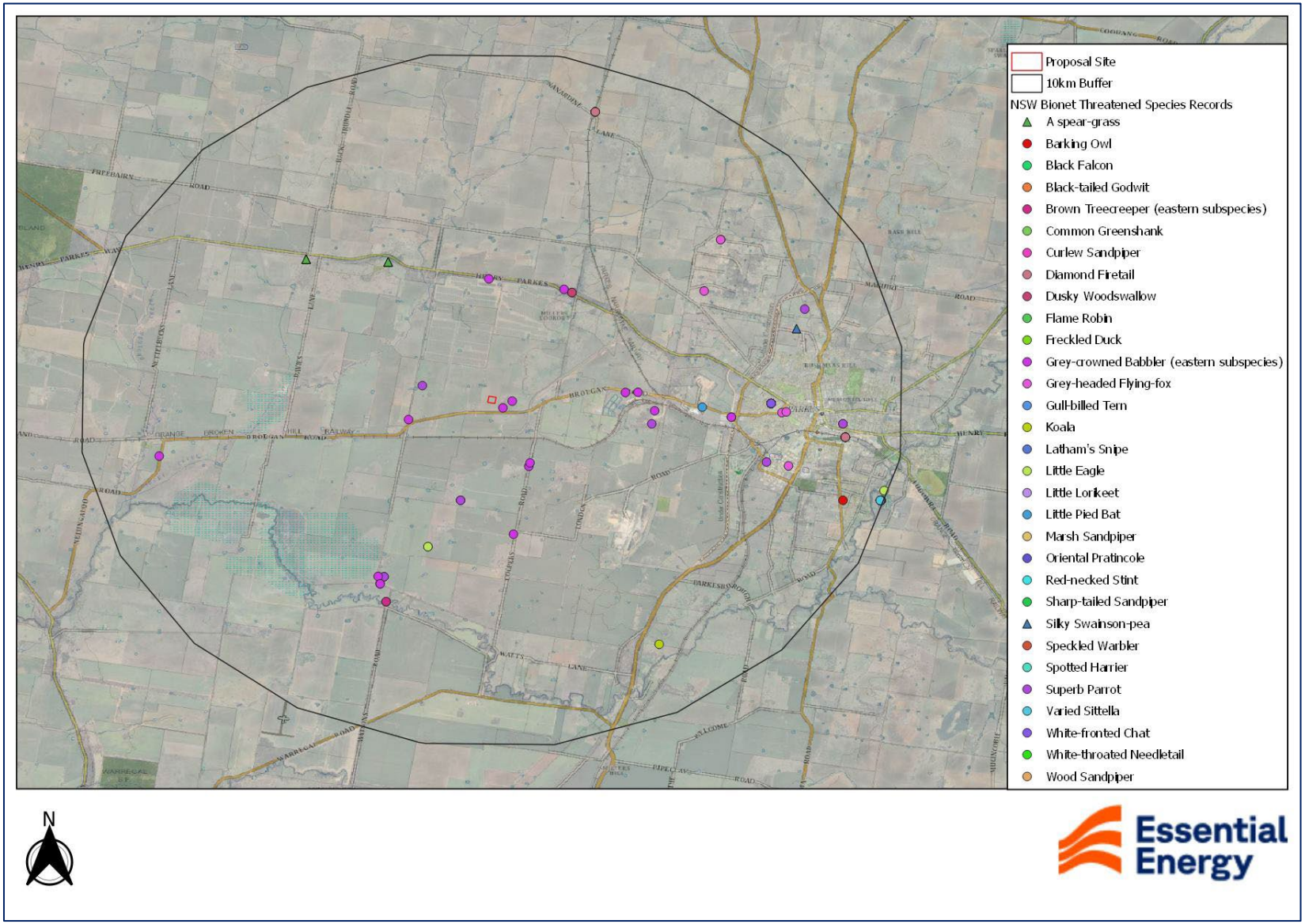

Figure 14: NSW BioNet Threatened Species Records within 10km buffer of the proposal site

Table 7: EPBC Protected Matters Report summary

MNES	RESULT	SUMMARY / RELEVANCE TO THE PROPOSAL
World Heritage Properties	None	-
National Heritage Places	None	-
Wetlands of International Importance	4	Banrock Station Wetland, Riverland, Hattah-Kulkyne Lakes, The Coorong, and Lakes.
Great Barrier Reef Marine Park	None	-
Commonwealth Marine Area	None	-
Listed Threatened Ecological Communities	4	Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. Weeping Myall Woodlands. White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Poplar Box Grassy Woodland on Alluvial Plains.
Listed Threatened Species	39	21 bird, three fish, one frog, one insect, four mammal, two reptile and eight plant species. Of these, five bird and two mammal species have been recorded within 10km of the proposal site, according to the NSW BioNet database.
Listed Migratory Species	10	All migratory birds species. Two classified as migratory terrestrial, seven migratory wetland species, and one as a marine bird,, the latter of which unlikely to be relevant to the proposal.
Commonwealth Land	9	Two CSIRO, one Australian Postal Commission, four Australian Telecommunications Commission, two Defence Training Depots.
Commonwealth Heritage Places	None	-
Listed Marine Species	18	All 18 are marine birds species.
Whales and Other Cetaceans	None	-
Critical Habitats	None	-
Commonwealth Reserves Terrestrial	None	-
Australian Marine Parks	None	-
Habitat Critical to the survival of Marine Turtles	None	-
State and Territory Reserves	None	-

MNES	RESULT	SUMMARY / RELEVANCE TO THE PROPOSAL
Regional Forest Agreements	None	-
Nationally Important Wetlands	None	-
EPBC Act Referrals	4	2009/4741: Construction of Single Circuit 132 kV Transmission Line between existing substations (completed). 2015/7522: Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia (completed). 2016/7731: Parkes to Narromine Section Inland Rail, NSW (Post approval). 2024/09834: Mara Team Testing – Jason (Post Approval)
Key Ecological Features (Marine)	None	-
Biologically Important Areas	None	-
Bioregional Assessments	None	-
Geological and Bioregional Assessments	**None**	-

Weeds

In the broader SAP development site WSP (2019a) identified nine High Threat weeds listed under the BC Act, four of which are listed as Priority Weeds for the Central West region under the *Biosecurity Act 2015* and two are listed as Weeds of National Significance (WoNS).

Areas of outstanding biodiversity value

The proposal site is not located within a declared area of outstanding biodiversity value.

Biodiversity values map

The proposal site is not located on land identified as having biodiversity values, according to the NSW Biodiversity Values Map (refer **Figure 15**). The closest land feature mapped as having biodiversity value is Ridgey Creek, located approximately 2.6km northwest of the proposal site. Under Part 5 of the EP&A Act, impact to native vegetation in areas mapped on the Biodiversity Values Map does not trigger assessment under the Biodiversity Offset Scheme. However, this mapping can provide information about the vulnerability of the threatened species and communities in the region.

Key Fish Habitat

The proposal site is not located within mapped key fish habitat according to NSW Fisheries Key Fish Habitat Map (refer **Figure 16**). Ridgey Creek, located approximately 2.6km northwest of the proposal site is mapped as being key fish habitat.

Groundwater dependant ecosystems

The Bureau of Meteorology (BoM) Atlas of Groundwater Dependant Ecosystems map (BoM, 2019) was reviewed for Groundwater Dependent Ecosystems (GDEs). No aquatic, terrestrial or subterranean GDEs are mapped within or in the near vicinity of the proposal site.

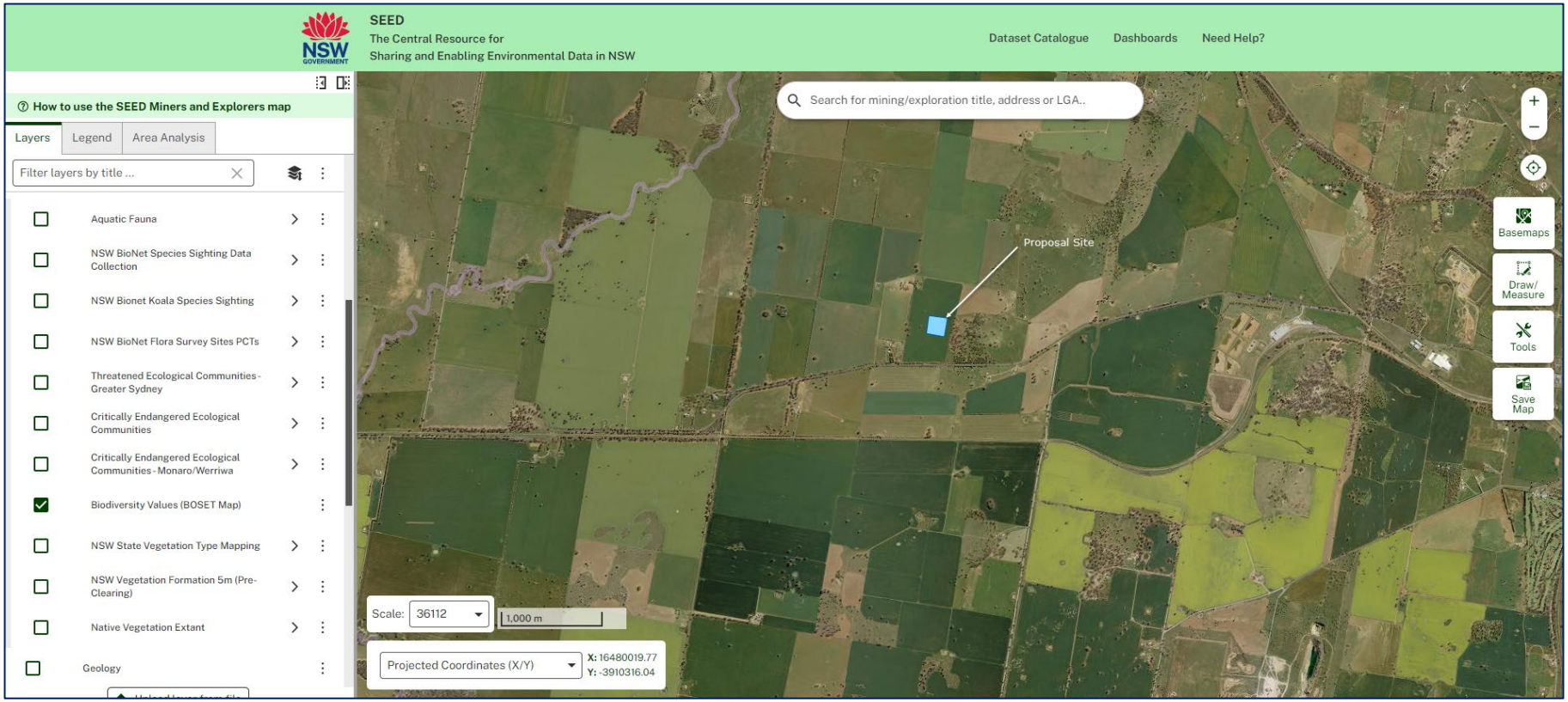

Figure 15: Mapped biodiversity values within the vicinity of the proposal site

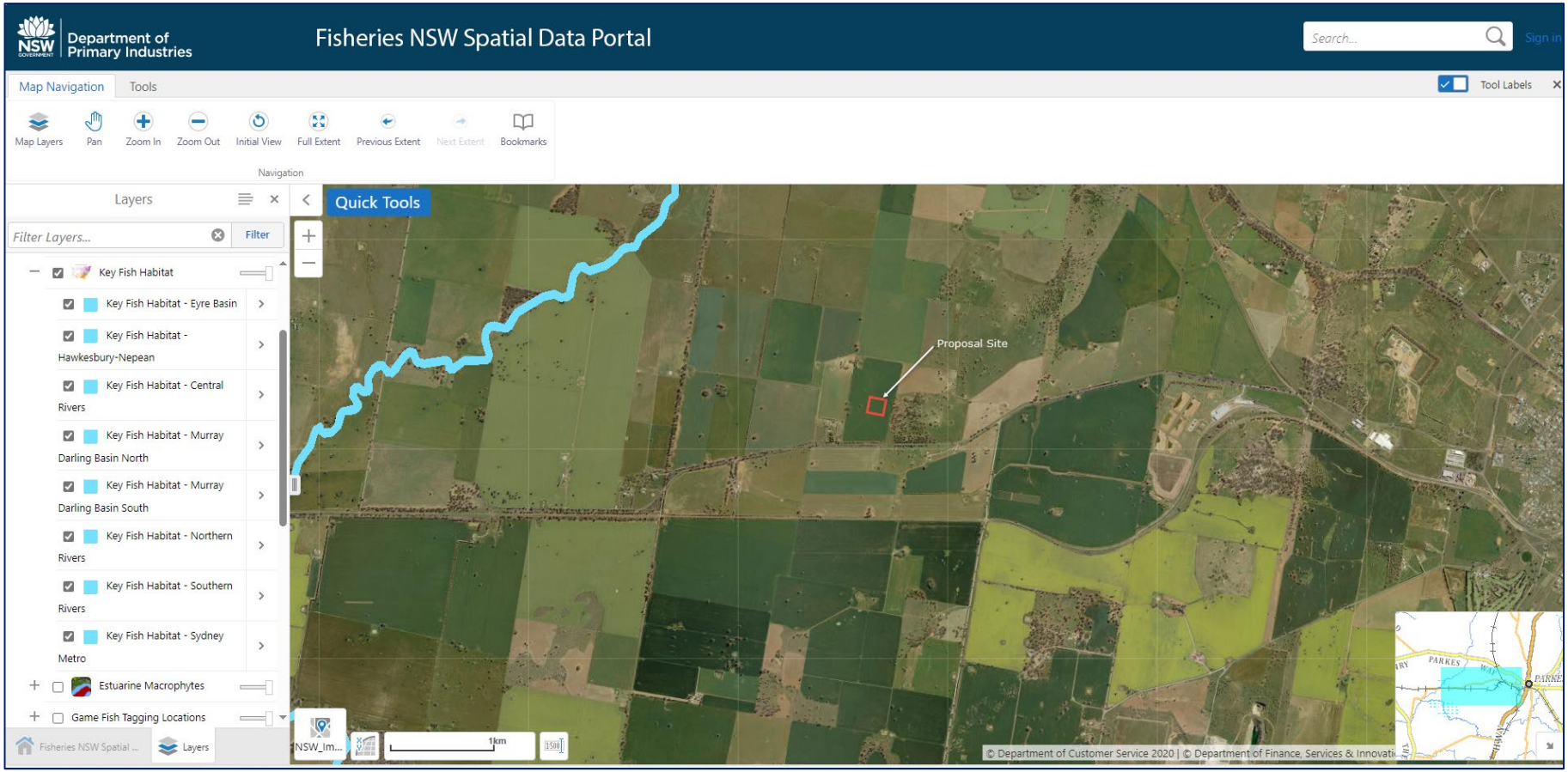

Figure 16: Mapped key fish habitat within the vicinity of the proposal site

Site Inspection

A site inspection was conducted by Essential Energy's Environmental Senior Specialist on 24 July and 17 September 2024. The inspection on 17 September was accompanied by two ecologists from AREA Environment and Heritage. The proposal site is consistent with a highly modified and disturbed environment due to the range of historical and recent land uses identified through the desktop assessment. The proposal site has been cleared of all woody vegetation. There are no trees or shrubs present. Only groundcover species, comprising of predominately exotic pasture and weed species (approximately 90% coverage). Groundcover species identified within a representative 20m by 20m vegetation plot undertaken near the centre of the proposal site are provided in **Table 8**.

No threatened flora or fauna species were observed at the proposal site during the site inspections.

Table 8: List of flora species representative of the proposal site

SCIENTIFIC NAME	COMMON NAME	NATIVE / EXOTIC
Avena fatua	Common Wild Oat	Exotic
Calotis lappulacea	Yellow Burr-daisy	Native
Capsella bursa-pastoris	Shepherd's Purse	Exotic
Carthamus lanatus	Saffron Thistle	Exotic
Cucumis myriocarpus	Camel Melon	Exotic
Cynodon dactylon	Couch Grass	Exotic
Dichondra repens	Kidney Weed	Native
Fumaria officinalis	Common Fumitory	Exotic
Hordeum leporinum	Barley Grass	Exotic
Hypochaeris radicata	Flatweed	Exotic
Juncus sp.		Exotic
Lactuca serriola	Prickly Lettuce	Exotic
Marrubium vulgare	Horehound	Exotic
Medicago polymorpha	Burr Medic	Exotic
Onopordum acanthium	Scotch Thistle	Exotic
Rumex brownii	Swamp Doc	Native
Stellaria media	Stellaria Media	Exotic
Trifolium repens	White Clover	Exotic

6.5.2 ASSESSMENT OF IMPACT

The proposed Brolgan ZS site is located within the broader Parkes SAP development site. Desktop review indicates the proposal site has been subject to historical and recent land use disturbances. The level of disturbance was confirmed during recent site inspections undertaken in July and September 2024, where

evidence of past disturbance, i.e., clearing, soil disturbance, and cultivation was clearly visible at the proposal site (refer **Plates 1** to **2**).

Threatened Species Populations and Ecological Communities

No woody vegetation is present at the proposal site, with no tree or shrub layer. Only groundcover species, comprising of predominately exotic pasture and weed species (approximately 90% coverage) are present at the proposal site. The vegetation at the proposal site does not meet the characteristics of any mapped PCTs according to the NSW SVTM. No BC Act or EPBC Act listed TECs have been previously mapped as occurring at the proposal site as part of the Biodiversity Assessment completed for the SAP site (WSP, 2019a). The vegetation does not meet the requirements of any of the EPBC Act listed TECs identified to potentially occurring within 10km of the proposal site.

The threatened species searches (refer **Tables 5**, **6**, and **Appendix B**) identify that there are records of threatened species and the potential for threatened species to be present in the broader area. However, no threatened flora or fauna species have been historically recorded within the proposal site, and none were detected opportunistically during the site inspections. Given the cleared, highly disturbed and modified nature of the proposal site, it provides negligible to nil habitat values for threatened species, populations, or communities. Given the known and predictable impacts associated with the proposal, the limited spatial scale of the proposal, and the fact that no woody vegetation removal is proposed, it is considered highly unlikely that threatened species, threatened ecological communities, or their habitats, will be impacted by the proposed works. Further assessment is not required.

Migratory Species

Approval under the EPBC Act is required for any action that has, will have, or is likely to have a significant impact on a listed migratory species. All 10 migratory species with the potential to be present within 10km buffer of the proposal site, are birds, with one classified as a marine bird, two as migratory terrestrial and seven migratory wetland species. Impact to these migratory species have been considered against the significant impact criteria in **Table 9**.

Table 9: EPBC Assessment of Significance for Migratory Birds

AN ACTION IS LIKELY TO HAVE A SIGNIFICANT IMPACT ON A MIGRATORY SPECIES IF THERE IS A REAL CHANCE OR POSSIBILITY THAT IT WILL:		
	CRITERIA	**RESPONSE**
I.	substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	There is little evidence to suggest that the proposal site supports important habitat for migratory species given the absence of permanent water and high disturbance levels. The lack of proximity of wetlands of international importance reduces the likelihood that habitat in the proposal site is important habitat. The proposal is therefore unlikely to substantially modify, alter, destroy or isolate important habitat for the listed migratory bird species.
II.	result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	The local area has a history of habitat modification for cultivation, grazing and other agricultural activities. The proposal is unlikely to further contribute to establishment of invasive species beyond that which may already exist.
III.	seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	The proposal site is not an area of important habitat for migratory birds, whether they are marine, wetland or terrestrial species. It is unlikely that an ecological significant proportion of migratory birds would rely on habitat in the proposal site.

Impact to groundwater dependent communities

No aquatic, terrestrial or subterranean GDEs are mapped within the proposal site, or in the near vicinity.

Impact to hollow bearing trees

No trees are located on the proposal site.

Fragmentation of habitat

Vegetation in the surrounding landscape is already highly fragmented from historical disturbances. The proposal site itself is already cleared of all woody vegetation, and therefore is unlikely to contribute to further fragmentation of habitat.

Soils and drainage

Soils will be disturbed during construction. Disturbed soils have the potential to move off the proposal site and impact waterways if not appropriately managed. Site stabilisation practices, including installation of appropriate erosion and sediment controls (refer **Section 6.2.3**) will be applied to the area during and where required after construction, to ensure no long-term impact to the biodiversity values. The development will not have long term or lasting impact on the areas hydrology at any scale.

Indirect impacts

Injury to wildlife

Injury to wildlife is possible, but unlikely during the construction phase of this proposal. Contact with wildlife and suitable habitat will be avoided wherever possible. Local wildlife rescue organisation should be contacted in the event wildlife requires rescue or removal.

Spread of pests, weeds and disease

The risk of spreading pests and disease is unlikely given works will be contained to an already disturbed site.

Invasion and spread of weeds is also considered unlikely, although soil disturbance may result in new weed populations or encourage seed germination of existing weed species. Introduction or spread of weeds through the proposal site may be associated with these actions:

- Removing groundcover species
- Excavation, soil stripping and importation of fill.

Management of weed dispersion is considered in the mitigation measures **Section 6.5.3**.

Impact on Key Threatening Processes

Key Threatening Processes (KTPs) listed under the BC Act, EPBC Act and FM Act were reviewed. Only one, invasion of native plant communities by exotic perennial grasses, is considered to be negligibly exacerbated by the proposal. The KTP can be minimised and managed by the mitigation measures in **Section 6.5.3.**

6.5.3 ENVIRONMENTAL MITIGATION MEASURES

Siting the location of the proposed new ZS on previously cleared and disturbed land has minimised potential impact to flora and fauna considerably. Notwithstanding, to ensure potential impacts to flora and fauna are further minimised and managed, the following mitigation and management measures are to be implemented:

- Limiting the disturbance of vegetation to the area assessed under this REF
- If fauna is detected within the worksite, the animal is to be allowed to leave the site without any coercion or a local wildlife rescue service is to be contacted to facilitate the safe removal of the animal from the worksite

- Essential Energy has a general biosecurity duty under the *Biosecurity Act 2015* to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable. Field crews shall follow procedures as outlined in Essential Energy's Operational Guideline: Biosecurity Risk Management (CERM1000.96) to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable, with particular reference to vehicle and equipment hygiene practises.

6.5.4 CONCLUSION

It is unlikely the proposal will have impacts on flora and fauna during construction and operational activities. The environmental risk is considered to be low.

6.6 Aboriginal Heritage

6.6.1 EXISTING ENVIRONMENT

A desktop assessment of Aboriginal heritage was undertaken in the general vicinity of the proposal site. A review of registered sites from Heritage NSW's Aboriginal Heritage Information Management System (AHIMS) (NSW Heritage 2024) was undertaken (refer **Appendix C**). The search revealed no Aboriginal sites or objects located within, or in close proximity to the footprint of the proposed ZS site. An extensive search revealed seven registered sites located in the general vicinity (within approximately 2km) of the proposal site. These are listed in **Table 10**, and illustrated in **Figure 17**.

Table 10: Registered AHIMS sites in general vicinity of the proposal site

SITE ID	SITE NAME	CONTEXT	SITE STATUS	SITE FEATURES
43-3-0136	Parkes Solar Relocated Artefacts	Open site	Valid	Artefact
43-3-0115	Parkes Solar IF3	Open site	Destroyed	Artefact
43-3-0116	Parkes Solar IF2	Open site	Destroyed	Artefact
43-3-0117	Parkes Solar IF1	Open site	Destroyed	Artefact
43-3-0122	GSF-14 Artefact Cluster	Open site	Destroyed	Artefact
43-3-0123	GSF-13 Isolated Artefact	Open site	Destroyed	Artefact
43-3-0170	Parkes SAP IF-5	Open site	Valid	Artefact

6.6.2 PREVIOUS INVESTIGATIONS

Several previous Aboriginal cultural heritage investigations have been undertaken in the immediate area surrounding the proposal site. Key findings of each investigation are summarised below.

Aboriginal Due Diligence Assessment Report Parkes Special Activation Precinct Enabling Works Parkes, NSW (Ozark 2021)

OzArk Environment & Heritage (OzArk) were engaged by the NSW RGDC to complete an Aboriginal Due Diligence heritage assessment for the enabling works related to the Parkes SAP, including upgrades to Brolgan Road to the south of the proposed new Brolgan ZS site. A visual inspection of the study area was undertaken by OzArk Senior Archaeologist and a representative of the Wiradjuri Council of Elders on 26–27 October 2020. No Aboriginal cultural heritage sites were recorded during the visual inspection and the one previously recorded isolated find in the study area was not able to be located due to low ground surface visibility in the area. One existing Aboriginal site (43-3-0170) required a 'no go zone' buffer around it to avoid inadvertent impacts during works.

Figure 17: Registered AHIMS site with approximately 2km of the proposal site

Aboriginal Cultural Heritage and Historic Heritage Assessment Report Parkes Special Activation Precinct (OzArk, 2019)

OzArk were engaged by WSP on behalf of the then NSW Department of Planning, Industry and Environment to complete an Aboriginal Cultural Heritage Assessment Report (ACHAR) and a historic heritage assessment of the Parkes SAP. A pedestrian survey sampling sections of the entire SAP investigation area was undertaken by OzArk archaeologists on 1–3 April 2019. Representatives of the Peak Hill Local Aboriginal Land Council were present for the survey. During the survey, five Aboriginal sites were recorded: Parkes SAP IF-1 (#43-3-0174), Parkes SAP IF-2 (#43-3-0173), Parkes SAP IF-3 (#43-3-0172), Parkes SAP IF-4 (#43-3-0171) and Parkes SAP IF-5 (#43-3-0170). No significant historic heritage sites were recorded during the survey.

All impact assessment was based only on the area inside the investigation area boundary, and assumes full development within each SAP sub-precinct, excepting green zones.

Due to the size of the SAP, it was not possible to survey the entire SAP development footprint. Notwithstanding, the investigation concluded, that in conjunction with previous studies, it is unlikely for archaeologically significant artefact scatters or intact archaeological deposits to be present inside the un-surveyed areas of the investigation area. Future specific developments should consider undertaking due diligences if the specific development is outside areas which have already been surveyed.

Aboriginal Cultural Heritage Assessment Parkes Solar Farm (NGH Environmental, 2016)

NGH Environmental were engaged by Neoen Australia Pty Ltd (Neoen) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed Parkes Solar Farm, located to the northwest of the proposed Brolgan ZS site. The Parkes Solar Farm proposal site covers up to 240ha of land. Key infrastructure components include the installation of a solar plant with a capacity of up to 57 MVA.

Consultation with Aboriginal stakeholders was undertaken in accordance with then clause 80C of the then *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* following the consultation steps outlined in the (ACHCRP) guide provided by OEH. Survey transects were undertaken on foot and traversed the main part of the proposed solar farm site. The survey was impeded by overall poor visibility, although there were areas where visibility was variable and in some instances quite high. Between the three survey participants, just over 52 km of transects were walked across the main proposal area.

Seven isolated artefacts were found across the proposal area (PSIF1, PSIF2, PSIF3, PSIF4, PSIF5, PSIF6 and PSIF7). Extrapolating from the results of survey, it was considered likely that additional artefacts could occur within the proposed development footprint. However, based on the land use history of the proposal area, and an appraisal of the area from the field survey, there is low potential for the presence of intact subsurface deposits

It was recommended that the development proposal should be able to proceed with no additional archaeological investigations. No areas of Potential Archaeological Deposits (PADs) were identified and the significance of the Aboriginal heritage objects within the proposal site assessed as low. If complete avoidance of the recorded artefacts within the proposal area (PS IF1-7, PIF1/Ridgey Creek-Parkes) was not possible, it was recommended that the artefacts be collected and moved to a safe area within the property, as close as possible to their original location, but which will not be subject to ground disturbance. The collection and relocation should be undertaken by representatives of the registered Aboriginal parties. A new AHIMS site card will need to be completed identifying the new location of the moved artefacts.

Lastly, it was recommended that Cultural Heritage Management Plan (CHMP)be prepared in consultation with the registered Aboriginal parties prior to construction and that further archaeological assessment would be required if the proposal activity extends beyond the area of the current investigation. This would include consultation with the registered Aboriginal parties and may include further field survey.

Aboriginal Cultural Heritage Assessment Report Proposed Goonumbla Solar Farm, Parkes, NSW (Access Archaeology and Heritage, 2016)

Access Archaeology and Heritage Pty Ltd (AAH) was engaged by Renewable Energy Developments Pty Ltd to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed Goonumbla Solar Farm, located approximately 1,800m to the north of the proposal site, at its closest point. The total property area purchased for the Goonumbla Solar Farm was 387 ha and the proposed development footprint covered an area of approximately 290 ha.

Consultation with Aboriginal stakeholders was undertaken in accordance with the clause 80C of the then *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010*. The notification phase resulted in two members of the local Aboriginal community expressing interest in the project, and both participated in the field survey which took two days.

A total of sixteen archaeological sites were recorded during the field survey, these being:

- 12 Isolated artefacts,
- 3 Artefact Scatters and
- 1 stone hatchet quarry

The stone hatchet quarry was within the property boundary but is outside the proportion of the property able to be developed as a solar farm.

It was recommended that development proposal should proceed with no further archaeological assessment. No areas of Potential Archaeological Deposit (PAD) were identified that would warrant test excavation and the significance of the Aboriginal heritage objects within the study area was considered low.

6.6.3 SITE INSPECTION

Essential Energy's Senior Environmental Specialist undertook an inspection of the proposal site on 24 July and 17 September 2024. Each site inspection included a thorough walkover of the proposal site. Photographic and written records were made of the landscape features relevant to archaeological potential. These features included disturbance levels, Ground Surface Visibility (GSV) and where present, any landforms of higher archaeological potential.

Ground surface visibility (GSV) was generally good (approximately 80%) across the proposal site during both inspections, due to relatively short cultivated grass and weed cover. The ground surface over the entire proposal site was highly disturbed, and comprised of a heavily modified and cleared farm paddock, with only groundcover species present, dominated by exotic grasses and weeds, with limited native species. Historic disturbance is likely to also have included ploughing, as evidenced by the presence of cultivated grass species and furrows in exposed areas of ground surface (refer **Plates 1** and **2**). No items or objects of Aboriginal heritage were observed during either of the site inspections.

6.6.4 ASSESSMENT OF IMPACT

The NPW Act requires that proponents follow a due diligence approach in regard to the protection of Aboriginal objects. There are three essential issues to consider when undertaking a due diligence assessment:

- The nature of the proposed activity (e.g. the extent of development impacts)
- Land condition and prior land uses (e.g. impacts to bushland or undisturbed ground, areas containing sandstone outcrops, rock shelters and overhangs, old growth trees, sand bodies, ground adjacent to creeks, rivers, lakes and swamps)
- Knowledge and available information (e.g. AHIMS database search, previous reports or studies relating to the site or in the area, and local knowledge, such as councils or Local Aboriginal Land Councils (LALC)).

An assessment against the due diligence requirements is provided in **Table 11**

Table 11: Assessment against due diligence requirements

ABORIGINAL HERITAGE DUE DILIGENCE PROCESS			
Step	**Question**	**Answer**	
1.	Are you disturbing the ground surface or culturally modified tree? *If yes proceed to step 2, if no, Aboriginal heritage considerations not required proceed with caution*	☒ Yes	☐ No
2.	Are you working near known Aboriginal sites – check the Aboriginal heritage information management system (AHIMS)? (https://www.environment.nsw.gov.au/awssapp/Login.aspx?ReturnUrl=%2fawssapp). Attach results from search. *If no, proceed to step 3. If yes, must obtain site cards/information and proceed to step 4.*	☐ Yes	☒ No
3.	Are you carrying out development on disturbed land? Land is disturbed if it has been the subject of a human activity that has changed the land's surface, being changes that remain clear and observable. Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.)? If yes, Aboriginal heritage considerations not required proceed with caution and no further consideration required. If no proceed to step 4.	☒ Yes	☐ No
4.	Is there any other information which suggests an Aboriginal object or place at or near where the works will be carried out?	☐ Yes	☐ No
5.	Are there any landscape features which may indicate the presence of Aboriginal objects? This includes proposed activities: a. Within 200m of waters, b. Below within 200m below or above a cliff face, c. located within a sand dune system, d. within 20m of, or in, a cave, rock shelter or a cave mouth; e. on land not disturbed Note: "waters" and "sand dune system" are defined in the due diligence code of practice) and/or	☐ Yes	☐ No
6.	Are you unable to avoid harm to any known object or disturbance of the landscape feature with potential for an Aboriginal heritage find?	☐ Yes	☐ No
7.	Has there been a visual inspection by a person with expertise in locating and identifying Aboriginal objects?	☐ Yes	☐ No

If yes to 4, 5, or 6 above, then further Aboriginal archaeological investigations, for example, a field survey by an Environmental Services team member or engagement of an archaeologist are required prior to works. If no, describe why harm to Aboriginal objects is not likely (refer below).

As evident from the desktop search, five of the seven registered sites identified within approximately 2km of the proposal site have been destroyed during the construction of the nearby Parkes and Goonumbla Solar Farms. The two remaining valid sites, 43-3-0136 (Parkes Solar Relocated Artefacts) and 43-3-0170 (Parkes SAP IF-5) are located approximately 1,530m northwest and 1,940m southwest of the proposal site, respectively, and will not be impacted by proposed work.

While several isolated objects were identified during survey work at the nearby Parkes and Goonumbla Solar farms, both investigations concluded that no areas of PAD were identified and the significance of the Aboriginal heritage objects within the solar farm sites assessed as low. Similarly, the OzArk (2019) archaeological investigation of the broader SAP development site concluded that is unlikely for archaeologically significant artefact scatters or intact archaeological deposits to be present inside un-surveyed areas of the SAP. This combined with the lack of evidence of surface objects located within the proposal site, despite more recent survey effort, indicates little to no potential for Aboriginal objects to be present within the proposal site.

The proposal site has been subjected to a high degree of historical land disturbance associated with cultivation, ploughing and grazing.

No trees were identified within the proposal site.

Considering the highly disturbed nature of the proposal site, lack of evidence of Aboriginal objects from past and recent surveys at the proposal site, the proposal is not likely to impact Aboriginal heritage.

6.6.5 ENVIRONMENTAL MITIGATION MEASURES

In order to mitigate any potential impacts on Aboriginal heritage, the following mitigation measures will be employed:

- All construction work would be undertaken within the assessed areas of the proposal site only
- In the unlikely event that an Aboriginal heritage site or object is located during the construction phase of the project, works will cease in that area and a representative from Essential Energy's Environmental Services will be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken
- If human remains are uncovered, works must immediately cease and the NSW Police department and Essential Energy's Environmental Services team will be notified.

6.6.6 CONCLUSION

The proposal is not anticipated to have any impact upon Aboriginal heritage in the area. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.7 Non-Aboriginal Heritage

6.7.1 EXISTING ENVIRONMENT

Non-Aboriginal heritage refers to any deposit, object or material evidence which relates to the settlement of New South Wales, not being Aboriginal settlement, and is of state or local heritage significance (Section 4 of the Heritage Act).

A desktop search of Australia's World Heritage Sites (Commonwealth DCCEEW, 2024b), National Heritage List (Commonwealth DCCEEW, 2024c), NSW State Heritage Inventory (Heritage NSW, 2024), Parkes LEP 2012 was conducted to determine the extent of non-Aboriginal heritage in the vicinity of the proposal site.

6.7.2 ASSESSMENT OF IMPACT

A review of the above-mentioned heritage registers indicated no sites of world, national, state or local heritage significance are within, or in the near vicinity of the proposal site. The nearest identified non-Aboriginal heritage site was a locally listed heritage site on the Parkes LEP, the Parkes Railway Station group (Item I6) located approximately 6.7km east of the proposal site (refer **Figure 18**). The local heritage site will not be impacted by the proposal.

The OzArk (2019) investigation indicated no significant historic heritage sites were recorded during the survey of the broader SAP site.

The site inspections undertaken on 24 July and 17 September 2024 did not indicate any evidence of non-Aboriginal heritage items being located within the proposal site.

Given the level of historical and more recent disturbance at the site, lack of records at, and in the immediate vicinity of, the proposal site, it is unlikely the proposal will impact non-Aboriginal heritage.

6.7.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures would be applied:

- All construction work would be undertaken within the assessed areas of the proposal site only
- In the unlikely event that a previously unknown heritage site or object is located during construction of the proposal, works would cease immediately in that area and a representative from Essential Energy's Environmental Services would be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken

6.7.4 CONCLUSION

The proposal is unlikely to have a significant impact upon non-Aboriginal heritage in the area. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.8 Contamination

6.8.1 EXISTING ENVIRONMENT

6.8.1.1 Desktop Assessment

A search of the NSW EPA 'Contaminated Land – Record of Notices' (EPA, 2024a) and 'List of NSW Contaminated Sites Notified to EPA' (EPA, 2024b) did not identify any contaminated sites within or in the near vicinity of the proposal site.

A search of NSW Department of Primary Industries (DPI) Cattle Tick Dip Site Locator did not indicate any tick dip sites within or in the immediate vicinity of the proposal site.

Review of a Preliminary Site Assessment undertaken by WSP (2019i) for the Parkes SAP, indicated two main areas of concern regarding potential contamination within the overall SAP development site. A former Austop Wool processing facility wool processing, with disused evaporation ponds, and the Westlime quarry and former mine site, identified as having tailings dams relating to previous gold extraction. These sites are located approximately 2.6km east and 3.6km southeast of the proposed ZS site, respectively. Identified contaminates of concern at the sites include hydrocarbons, pesticides, heavy metals, chloride, sulfate, carbonate, nutrients, pH, cyanide, and sulfate.

Figure 18: Non-Aboriginal heritage items in the vicinity of the proposal site

6.8.1.2 Site Inspection

Inspection of the proposal site by Essential Energy's Environmental Senior Specialist, on 24 July and 17 September indicated the proposal site has undergone significant previous disturbance in the form of regular cultivation and cropping over the entire site. Within the substation footprint, a preliminary walk-over revealed no visual or olfactory evidence of hydrocarbon spills, or visual evidence of asbestos containing materials (ACM). The site has been cultivated and the limited vegetation cover present was predominately exotic species.

6.8.2 ASSESSMENT OF IMPACT

There are no known records of contamination at the proposal site. While surface soils and subsoils may have been subjected to periodic pesticide and fungicide use during agricultural activities, it is not expected that significant contamination would have resulted from the application of these chemicals. The lack of olfactory or visual evidence of contamination and understanding of prior land use, indicate that the risk of encountering significant areas of contamination is considered low, and could be managed on-site during construction.

While the potential exists for groundwater leachate from the evaporation ponds of the former Austop Wool processing facility and tailings dam relating to previous gold extraction at the Westlime quarry to be impacting local groundwater quality, it is considered unlikely to be impacting groundwater at the proposed ZS site. This is because, while WSP (2019d) inferred from available groundwater data that regional groundwater flow is generally towards the west, locally, groundwater flow will generally follow the topography. Given the distance and local topographic conditions, including the thrusted northeast-southwest trending geological ridge (North Parkes Volcanic Group) between the proposed ZS site and the two areas of potential contamination concern to the east of the proposal site, it is considered unlikely that any potential groundwater leachate from the former Austop Wool and Westlime quarry would impact the proposed ZS site.

The potential for other offsite sources of contamination to impact the proposal site is considered low.

Spillage of diesel, lubricating oils or other chemicals could occur during refuelling and/or maintenance of construction plant/equipment and vehicles, whilst leakage of fuels or oils could occur from poorly maintained construction plant/equipment and vehicles, during civil and construction work for the ZS. Any on-site chemical spill or leak could adversely affect the water quality of surrounding waterways. The risk of chemical spills and leaks is expected to be minor, provided that adequate mitigation measures are implemented (see **Section 6.8.3**).

6.8.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be adopted if and where required:

- It is intended to reuse surplus spoil beneficially on site, where possible.
- Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for excavated materials
- In the event of encountering any suspected contamination in the work area, it will be separated and contained on site until it can be classified in accordance with the EPA (2014) Waste Classification Guidelines, and then disposed of at a facility that is lawfully able to accept the waste
- Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling
- Sediment and erosion control structures will be established and maintained in accordance with The Blue Book to minimise potential impacts on receiving watercourses.

6.8.4 CONCLUSION

The proposal is not anticipated to have any impact upon contamination in the area. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.9 Electric and Magnetic Fields

6.9.1 EXISTING ENVIRONMENT

Electric and magnetic fields (EMF) are part of the natural environment and are present in the Earth's core and the atmosphere. EMF is also produced wherever electricity or electrical equipment are in use. Powerlines, electrical wiring, household appliances and electrical equipment all produce EMF.

The electric field is proportional to the voltage (which can be considered as the pressure with which electricity is pushed through the wires). The magnetic field is proportional to the current, that is, to the amount of electricity flowing through the wires. Both electric and magnetic fields are also dependent on the source geometry (i.e. conductor heights, cable depths, phase separations and so on). All fields decrease rapidly with distance from the source. Generally, the smaller the object or closer the conductors producing the field, the more rapidly the field would decrease with distance from the source. Essential Energy is aware of concerns in the community and some scientists regarding the possibility of adverse health effects from exposure to EMF.

All of the research has been extensively reviewed over the last 30 years by Australian and international inquiries and expert panels established for the purpose of trying to determine whether or not human exposure to EMF is related to adverse health effects.

There is scientific consensus that health effects have not been established, but that the possibility cannot be ruled out. Some scientists argue that there is a need for ongoing high quality scientific research in order to give better answers to the questions which have been raised. Others hold the view that no further research is required and that EMF should not be regarded as a risk to health.

It is well accepted by scientists that no study considered in isolation would provide a meaningful answer to the question of whether or not EMF can contribute to adverse health effects. In order to make an informed conclusion from all of the research, it is necessary to consider the science in its totality. Over many years, governments and regulatory agencies around the world have commissioned independent scientific review panels to provide such an overall assessment. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), as part of the Health and Ageing Portfolio, is a Federal Government agency charged with responsibility for protecting the health and safety of people, and the environment, from EMF.

ARPANSA advises that:

> "On balance, the scientific evidence does not indicate that exposure to 50 Hz EMFs found around the home, the office or near power lines is a hazard to human health."
>
> "... the majority of scientists and Australian radiation health authorities in particular, do not regard chronic exposure to 50 Hz electric and magnetic fields at the levels commonly found in the environment as a proven health risk. Moreover, the evidence we have is inconclusive and does not allow health authorities to decide whether there is a specific magnetic field level above which chronic exposure is dangerous or compromises human health."
>
> "At the present time there is no evidence that exposure to electric fields is a health hazard (excluding of course electric shock)."

There are currently no Australian standards regulating exposure to these fields. The National Health and Medical Research Council has issued interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields. These guidelines are aimed at preventing immediate health effects resulting from exposure to these fields. The recommended magnetic field exposure limit for members of the public (24 hour exposure) is 0.1 millitesla (1,000 mG - milligauss) and for occupational exposure (whole working day) is 0.5 millitesla (5,000 mG).

Essential Energy operates its powerlines, substations and other electrical infrastructure well within these interim guideline limits.

Essential Energy's policy involves providing balanced and accurate information, operating our electrical power system prudently within Australian health guidelines, and closely monitoring scientific research on the EMF health issue.

6.9.2 ASSESSMENT OF IMPACT

The proposed new ZS incorporates prudent EMF avoidance measures into the standard designs for substations. The design of the proposal has minimised the magnetic field as far as technically reasonable and within the context of "...[doing] whatever can be done without undue inconvenience and at modest expense to avert the possible risk [to health]", consistent with Gibbs Inquiry (1991).

The closest sensitive receivers are two rural premises (R1 and R2) located approximately 370m and 390m southwest of the proposal site, respectively, on the northern side of Brolgan Road. A third (R3) is located approximately 540m southeast of the proposal site on the southern side of Brolgan Road (refer **Figure 7**). Given the closest sensitive residential receiver is approximately 370m away, it is unlikely the new ZS will expose these sensitive receivers to EMF.

6.9.3 CONCLUSION

The proposal will comply with all relevant national and international guidelines. The resulting magnetic fields from the ZS are within the range of fields expected from electricity infrastructure in the area. The overall environmental risk is considered to be low.

6.10 Visual and Aesthetics

6.10.1 APPROACH

The following visual amenity assessment approach was applied to evaluate the potential visual impacts associated with the project. It is based on a professionally recognised system developed by the United States Forest Service (1974), and similar methods adopted by the Forestry Commission of Tasmania (1983) and the NSW Department of Planning (1980).

The approach used in this assessment is as follows:

- The existing visual environment of the site is described (in terms of landscape character, scenic quality, visual and landscape sensitivity and major view points);
- A brief description is made of the proposed visual changes; and
- An impact assessment is then undertaken, assessing both the changes to the site itself, and any impacts to views from surrounding areas.

The visual impact of the proposed activity has been determined though the interaction of visual modification and visual sensitivity. These are discussed in more detail in the following sections. The 'visual impact matrix', illustrated in **Table 12** is used to determine the potential visual impact of the proposed activity by combining a ranking of high, medium and low for both visual modification and visual sensitivity.

Table 12: Visual Impact Matrix

		VISUAL SENSITIVITY		
		High	Medium	Low
VISUAL MODIFICATION	High	High Impact	High Impact	Moderate Impact
	Medium	High Impact	Moderate Impact	Minor Impact
	Low	Moderate Impact	Minor Impact	Minor Impact

6.10.1.1 Visual modification

Visual modification expresses the visual interaction between the proposal and the existing visual environment. It is the visual contrast between pre and post-development, and is a combination of the appearance of the development (size, form, colour, texture), absorptive capacity of the landscape setting, and the distance from which the development is viewed. Visual modification is expressed here as high, medium or low.

High visual modification

A high degree of visual modification would result if the proposed developments are a major element and contrast strongly with the existing landscape. The contrast is likely to occur if there is little or no natural screening or integration created by vegetation, or if there is an open plain. For example, powerlines passing over vegetated ridge tops also usually represent a high visual modification, particularly if it is a new powerline passing through otherwise undisturbed vegetated terrain and the viewer is parallel to the line.

Medium visual modification

A medium degree of visual modification would result if the proposed developments are visible and contrast with the landscape but are integrated to some degree. This would happen if the surrounding vegetation and/or topography provide some measure of visual screening, backgrounding or other form of visual integration of the development with its setting. An example of a medium visual modification is an urbanised streetscape with existing powerlines and/or established trees on the roadside.

Low visual modification

A low degree of visual modification occurs if there is minimal visual contrast and a high level of integration of size, form, colour or texture between the development and the environment. This would occur if there is a high degree of visual integration of the development into the existing landscape or a low level of visual modification of the existing visual setting is achieved. A low visual modification may reflect a situation where the development may be noticeable, but it does not markedly contrast with the existing landscape, as is the case with upgrading existing powerlines.

Throughout the study area, the degree of visual modification is highly dependent on the distance the viewer is from a new development. As the distance from the new development to the viewing location increases, the development becomes less prominent, and therefore its visual modification is less.

Visual modification is also affected by the angle at which a new development is viewed. In general, the visual modification when viewing the new development at right angles is less than when viewing in parallel, depending on the distance from the new development.

6.10.1.2 Visual Sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape would be viewed from various viewpoints. This is dependent on a number of viewer characteristics, such as the number of viewers affected, land use, existing vegetation patterns, distance of the development from viewers, and the visibility of the development from critical viewing locations.

High visual sensitivity

Occupiers of residential properties with long viewing periods adjacent or within close proximity to the proposal. High sensitive areas can also apply to users of outdoor recreational areas, including reserved land or nature recreation such as walking, swimming, fishing or trail riding. This is particularly the case where their attention is focussed, in part, on the landscape and amenity that is being affected by the proposed development.

Medium visual sensitivity

Medium sensitivity would apply to circumstances in which viewers have intermittent exposure, such as outdoor workers and outdoor recreation users, however, for the recreational user, attention is focussed predominantly on the activity they are viewing, such as a sporting event, rather than the proposed

development. In addition, medium sensitivity would also apply to occupiers of residential properties with long viewing periods at a distance from or partially screened from the proposed development or project area.

Low visual sensitivity

Low sensitive viewers include predominantly those groups that have a short term view of the proposed development. This would be limited to mainly road users, trains or transport routes that are passing through or adjacent to the study area. Low sensitivity would also apply where viewers are adequately screened from the proposed development so that their viewing periods are limited to short periods.

6.10.2 EXISTING VISUAL ENVIRONMENT (LANDSCAPE DESCRIPTION)

WSP (2019e) indicated the broader SAP development site encompasses gentle undulating land, with an elevation ranging from approximately 270 m to 351 m. In the western and northern portions of the SAP, most relevant to the location of the proposed ZS, aspects are generally westerly to north westerly, respectively.

The proposed ZS site is situated predominately in a flat area with nearby rounded low hills of the Goonumbla Hills Landscape, as described in the Mitchell Landscapes Mapping V3 (Department of Environment, Climate Change and Water [DECCW] 2010a). The proposal site has been subject to cultivation and cropping where ground elevation was predominantly flat.

The visual landscape surrounding the proposed ZS lot includes:

- **North:** Cleared farmland immediately north, with Goonumbla Solar Farm, Henry Parkes Way and predominately cleared farmland further north beyond
- **East:** Cleared farmland immediately to the east, with partially vegetated farmland rising into rounded hills, a railway and Brolgan Road further east beyond
- **South:** Cleared farmland immediately to the south, with Brolgan Road and predominately cleared farmland and a railway further south beyond.
- **West:** Predominately cleared farmland immediately to the west, with a strand of semi mature trees and predominately cleared farmland further west beyond.

6.10.3 ASSESSMENT OF IMPACT

6.10.3.1 Visual modification

The construction of the proposed ZS will initially require the removal of groundcover and topsoil and importation of suitable material for the ZS bench. The civil works and site preparatory works will be short term but will create a high degree of change to the visual landscape.

A permanent change to the visual landscape will arise upon the construction of the electrical infrastructure required for the ZS, including:

- Two transformer bays
- Two 132kV feeder bays
- One prefabricated control building
- One prefabricated battery and telecommunication building, with amenities
- One prefabricated 11kV switchroom
- High voltage switchgear operating at 11kV and 132kV
- Control equipment
- Auxiliary transformers
- Water tanks
- Structures including lightning masts, fencing, and driveways.

The three prefabricated buildings will be of neutral colour (e.g., Woodland Grey) and be situated at the southern edge (facing Brolgan Road) of the internal benched area. An example of a similar prefabricated building used in the nearby Quorn Park Switching Station project is illustrated in **Plate 3**. Building design plans are provided in **Appendix A**.

Initially, the establishment of the proposed ZS within the current rural visual landscape will likely result in a short term high visual modification, however, as new industries and commercial operations move into the Parkes Enterprise Sub-precinct of the SAP, the proposed ZS will have a higher degree of visual integration with future land uses, resulting in a low to medium visual modification over the long term.

6.10.3.2 Visual sensitivity

The majority of viewers of the proposed substation will be low sensitivity viewers given that the view will be short term and limited to passing views from motorists on Brolgan Road. The closest sensitive receivers are two rural premises located approximately 370m and 390m southwest of the proposal site on the northern side of Brolgan Road. A third is located approximately 540m southeast of the proposal site on the southern side of Brolgan Road. Views to the proposal site from these residences are partially obstructed by vegetation and surrounding topography. Visual sensitivity is assessed as low.

Plate 3 Example style of prefabricated building used at the nearby Quorn Park Switching Station

6.10.4 SUMMARY OF POTENTIAL IMPACTS

The design has been sympathetic to the future surrounding building infrastructure and minimising direct views of certain pieces of electrical infrastructure from current vehicle traffic along Brolgan Road, as well as current and future commercial / industrial receivers. Visual modification has been assessed as being high over the short term and low to medium over the longer term. Visual sensitivity is considered to be low over both the short and long term. In accordance with the visual impact matrix, the proposed activity is likely to result in a moderate visual impact in the short term and a minor visual impact over the longer term.

6.11 Waste

6.11.1 ASSESSMENT OF IMPACT

Waste material generated from the proposal would generally comprise the following:

- General construction waste including but not limited to cardboard, paper, wood, mesh, steel, concrete, and other damaged or excess construction materials

- General refuse generated by personnel including putrescible wastes, food scraps, packaging and other domestic wastes
- Surplus excavated soil material from cut and fill (although not expected), excavation and trenching works.

Any surplus soil that cannot be reused on site will be assessed against the virgin excavated natural material (VENM) criteria, any relevant waste exemption and order, or classified and disposed of at a facility lawfully able to accept the waste.

Operation of the proposal is not expected to generate any substantial quantities of waste material, with the exception of transformer oil.

6.11.2 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be employed to minimise and manage impacts to waste:

- All wastes that are generated as a result of the project will be classified in accordance with the Waste Classification Guidelines (EPA, 2014)
- All waste material will be reused, recycled, or disposed of at a facility lawfully capable of receiving the waste.

6.11.3 CONCLUSION

The proposal is not anticipated to generate a large quantity of waste. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.12 Bushfire

6.12.1 EXISTING ENVIRONMENT

The proposal site is not mapped by the NSW Bushfire Prone Land Mapping given the lack of vegetation on the cultivated land that occurs over the ZS site.

6.12.2 ASSESSMENT OF IMPACT

The proposal comprises the construction of a new ZS on what is currently rural land, with grass cover as the predominate vegetation type. Activities with the potential to generate a spark will be avoided where possible during times of heightened bushfire risk.

6.12.3 ENVIRONMENTAL MITIGATION MEASURES

Ongoing vegetation maintenance would occur to ensure safe clearance distances are maintained around the ZS perimeter.

6.13 Traffic and Access

6.13.1 EXISTING ENVIRONMENT

The proposal site is located within an existing farm paddock, currently with no formalised, dedicated access from Brolgan Road. Brolgan Road is a local, two-way road, and is the main spine road servicing the broader SAP. Brolgan Road is in the latter stage of being upgraded to be suitable for Performance Based Standards (PBS) Level 3A vehicles.

6.13.2 ASSESSMENT OF IMPACT

The proposal site will be accessed via a new access road to be constructed from the upgraded Brolgan Road to the south. This access road is being designed and constructed by RGDC and will ultimately be a shared right of access for both the ZS and future lots created as a part of subdivision with the Parkes Enterprise Sub-precinct of the broader Parkes SAP development site.

Car parking will be provided within the substation yard. Given that the substation will be an unmanned facility, this will provide for sufficient off-street parking.

Based on the estimated 6,680m^3 of select material that will be imported and compacted to create final ZS bench height, and assuming a bulk density of 1.4, approximately 9,352 tonnes of select material will require importing to site. A typical truck and dog setup has a capacity of approximately 42 tonnes, so that would equate to approximately 223 truck movements.

Local road users may be subject to minor delays during the delivery of equipment or materials to the proposal site. During operation, the proposal would only be accessed irregularly by maintenance personnel. The proposal would not strain the capacity of the road system.

6.13.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measure will be employed:

- The need for a traffic management plan (TMP) for the construction phase would be determined in consultation with RGDC and, if required, completed prior to works commencing. The TMP would outline requirements for the safe and continued use of local transport corridors during construction

6.13.4 CONCLUSION

The proposal would have traffic and access impacts during construction and maintenance operations. The impacts would be short-term and minor. Upon implementation of the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.14 Land Use

6.14.1 EXISTING ENVIRONMENT

The proposal is located on rural land, currently zoned REZ – Regional Enterprise Zone according to the "State Environmental Planning Policy (Activation Precincts) 2020 Parkes Activation Precinct Land Application Map", listed in *State Environmental Planning Policy (Precincts—Regional) 2021*. The entire proposal site has been cleared and is currently subject to cultivation and cropping, and likely also used for grazing. Residential dwellings in the locality are limited given the rural nature of the area.

6.14.2 ASSESSMENT OF IMPACT

Whilst the construction of the new ZS will change the land use from a current rural use to an infrastructure use, the ZS will be located within the Parkes Enterprise Sub-precinct of the SAP, which is intended to support a wide range of compatible land uses and industries such as freight and logistics, advanced manufacturing and agribusiness. As such, it is assumed land use in this precinct will comprise future commercial, or industrial land use, and therefore the new Brolgan ZS will generally be located away from sensitive residential receivers, limiting potential land use conflict.

6.14.3 ENVIRONMENTAL MITIGATION MEASURES

The following measures should be adhered to during the construction phase of the proposed activity:

- Consultation about the proposed works and schedule will be undertaken with nearby residential receivers, where required
- The site should be left in a tidy condition at the conclusion of construction activities.

6.14.4 CONCLUSION

Any impacts on land use are likely to be low and manageable. Given the nature of existing land uses and proposed future use of the surrounding area, the overall environmental risk is considered to be low.

6.15 Social and Economic

6.15.1 EXISTING ENVIRONMENT

The proposal site is located in the Parkes Shire LGA. In 2016, Parkes Shire had a population of 14,608 people, with over 9,964 people living in the town of Parkes. Within the Shire are the towns of Alectown, Bogan Gate, Cookamidgera, Parkes, Peak Hill, Trundle and Tullamore. Many people also live on agricultural properties of varying sizes. The Parkes Shire has a relatively stable population, with growth mainly occurring in the Parkes township. Other towns are experiencing static or declining populations, largely due to younger residents moving to larger centres for education, employment and lifestyle opportunities. An ageing population and external migration of younger people continues to pose challenges for the long-term sustainability of diversity in the Parkes Shire population (PSC, 2020).

Analysis of the five-year age groups of Parkes Shire in 2016 compared to Regional NSW shows that there are a higher proportion of people in the younger age groups (under 15) and a lower proportion of people in the older age groups (65+). The majority of people living in the Parkes Shire indicate that they have Australian or English ancestry, followed closely by Irish, Scottish and German, with 88.5% of people being able to speak English only. When compared to the rest of NSW, the Parkes Shire has a higher percentage of the population with Aboriginal or Torres Strait Islander origins. Almost a quarter of the population aged over 15 years hold a vocational qualification; however, only 9.4% hold a Bachelor or Higher Degree. The unemployment rate in the Parkes Shire is 5.94%, which is also higher than the NSW average. Parkes residents have a lower median weekly household income than the NSW average, and less access to public transport, education and health care services than other areas of the State (PSC, 2020).

Agriculture is an important industry for the Parkes Shire, providing significant value to the economy as well as being a major employer. In 2018 there were 560 total registered businesses in the Parkes Shire, with agriculture making up over 40% of the total businesses. Mining, manufacturing and transport also make strong contributions to the economy. Over 200 sporting and community events and celebrations (Parkes Elvis Festival, ABBA Festival, Astrofest and the Parkes Picnic Races) support a range of local businesses and develop social capital in the shire. All these sectors are supported by a vibrant commercial centre at Parkes and significant public sector presence. The Melbourne to Brisbane Inland Railway project, Parkes Newell Highway Upgrade, expansion of the Parkes SAP, and proposed mining developments at Northparkes Mine and the Clean TeQ Sunrise mine are major projects that have potential to generate significant economic growth and employment in the Parkes Shire and surrounding region (PSC, 2020).

6.15.2 ASSESSMENT OF IMPACT

An improvement to the electricity supply network provides many benefits to the broader community through a secure and reliable electricity supply. The construction and operation of the new Brolgan ZS will be undertaken on what will become Essential Energy owned property, within the broader SAP.

In the absence of further augmentation to the high voltage supply network, there is an increased risk of supply interruptions, and it is unlikely that further development of the Parkes SAP could proceed. This would detrimentally impact on economic and social development of the region, and potentially prove to be disruptive to existing commercial enterprises and to residences throughout the local area.

The proposed new Brolgan ZS, along with the 132kV powerline (the latter subject to assessment in a separate REF) will support the development of the Parkes SAP. The Parkes SAP was selected because of the economic opportunities associated with the construction of an Inland Rail from Brisbane to Melbourne and the existing east-west Sydney to Perth/Adelaide Rail corridor which cross at Parkes township, creating an opportunity for an Inland Port. The Parkes SAP will lead to investment in common-use infrastructure, including roads infrastructure, water, electricity, telecommunication, gas systems and services, high speed internet and data connections and facilities, and other possible infrastructure or services. The Parkes SAP is an economic enabler that will address market failures and leverage catalyst opportunities. The Parkes SAP is a place-based approach to 'activate' this strategic location (WSP, 2019b). Grid electricity connection works are identified in both the *Parkes SAP Master Plan* (DPIE, 2020) *Parkes Special Activation Precinct Draft Structure Plan* (Jensen Plus. 2019), and the *Parkes Special Activation Precinct Delivery Plan September 2024* (RGDC, 2024b).

The proposal would also support the push for renewables, including solar power, and connections into the National Electricity Grid outlined as part of the vision in the *Parkes Shire Local Strategic Planning Statement 2020* (PSC, 2020). The proposal, in part, will also support Planning Priority 5 of the same document, by providing adequate infrastructure to service the Parkes National Logistics Hub Special Activation Precinct. Furthermore, the proposal, through the connection of a new solar farm, supports Objective 2 of the *Central West and Orana Regional Plan 2041* (DPE, 2022b) by supporting the State's transition to Net Zero by 2050 and deliver the Central–West Orana Renewable Energy Zone.

The proposal is unlikely to affect community resources; this may include the use of community infrastructure roads, water, and waste management services. The proposal is unlikely to cause substantial change or disruption to the community through loss of neighbourhood cohesion, access to facilities, community identity, or cultural character.

Electricity is an essential service in the human environment, by virtue of enhancing productivity, comfort, safety, health and the economy. The benefits of a secure and reliable electricity supply are evident in every aspect of our lives. Construction and operation of the proposed new ZS and associated augmentation of the associated powerline network will enable the connection of a number of new major customers to the grid, whilst ensuring a safe and reliable electricity supply to the broader Parkes region.

6.15.3 ENVIRONMENTAL MITIGATION MEASURES

The following mitigation measures will be employed to manage and minimise potential negative social and economic impacts:

- Management of construction traffic in the vicinity of construction works, including communication with existing local residents and road users
- Signs and barriers would be erected around construction work sites, where appropriate, to minimise the possibility of personnel injuries and prevent placing the public at risk.

6.15.4 CONCLUSION

Construction will be temporary in nature, and apart from some changes to the visual amenity, long-term impacts are not expected.

Negative social impacts would be short-term and minor. Longer term positive impacts are expected due to the proposal supporting the Parkes SAP and the economic and social opportunities that will flow from that development. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.16 Cumulative Impacts

Cumulative impacts may be experienced due to the interaction of elements within the proposal, or with other existing or proposed developments within the locality.

6.16.1 INTERACTIONS WITHIN OR IN CONNECTION WITH THE PROPOSAL

The proposed new Brolgan ZS, forms an integral component of the PAP HVSP that will service the broader Parkes SAP. The PAP HVSP also includes the construction of approximately 8km of new high voltage (single 132kV and dual circuit 132/66kV) powerline from connection points at Essential Energy's Quorn Park 132kV Switching Station (currently under construction) and TransGrid's existing 132/66kV Substation, to the new proposed Brolgan ZS. The proposed Brolgan ZS is the subject of this REF report prepared under Part 5, Division 5.1, of the EP&A Act. The proposed new high voltage overhead powerlines are subject to a separate assessment and approval, prepared under Part 5, Division 5.1, of the EP&A Act.

Route and design refinements are ongoing for the proposed high voltage powerline, and as such potential environmental impacts are yet to be formalised into the relevant environmental assessment documentation. However, based on preliminary review of background information and constraints, any potential impacts are likely to be similar to that resulting from the construction, operation and maintenance of typical high voltage powerlines within a rural setting. The main impacts associated with installation of the overhead high voltage powerline will be linear in nature with smaller, isolated disturbances, over the length of the route.

The predominately cleared and disturbed nature of the majority of the proposed overhead high voltage overhead powerline route is expected to have minimal potential ecological, Aboriginal and non-Aboriginal heritage impacts. Though some vegetation removal and trimming is anticipated to be required along the powerline route, compared to no woody vegetation removal at the ZS site.

Preliminary review of potential sources of contamination along the proposed high voltage powerline route suggests significant areas of contamination are unlikely to be encountered, and if encountered could be managed on-site during construction, in a similar manner to that of the ZS site. The majority of the excavated material for pole installation would be reinstated on-site. Any surplus excavated material would be assessed against the VENM criteria, any relevant waste exemption order, or classified and disposed of at a facility lawfully able to accept the waste, as will be the case at the proposed ZS site.

Visual impacts will differ over both spatial and temporal scales between the proposed high voltage powerline and ZS site. The primary difference will be that visual impact will be linear in nature and progressive along the proposed high voltage powerline route, compared to a defined construction site for the ZS site. Both will result in considerable short term visual change to the existing predominately rural landscape, however, as the Parkes Enterprise sub-precinct is developed both the high voltage overhead powerline and ZS will have a degree of integration with future industrial and commercial land uses of the sub-precinct.

Potential EMF impacts will be negligible and within relevant EMF exposure guidelines for both the high voltage overhead powerline and ZS operation. Any potential negative impacts to bushfire, traffic and access, land use, and social and economic associated with construction, maintenance and operation of the proposed new high voltage powerline, are anticipated to be negligible and similar to the ZS site.

Overall, construction, operation and maintenance of the PAP HVSP, of which the proposed Brolgan ZS forms an integral component, is expected to have positive social and economic benefits through the support of the Parkes SAP.

6.16.2 INTERACTIONS WITH OTHER DEVELOPMENTS WITHIN THE LOCALITY

The most significant development proposed in the nearby landscape is the Parkes SAP, within which the proposed new Brolgan ZS is located. The Parkes SAP covers an area of approximately 4,800ha, located west of the Parkes township, and bordered by Henry Parkes Way in the north and the Newell Highway to the east. The Parkes SAP will build on already-planned private and government investments, creating up to 3,000 jobs across a range of industries. A detailed assessment of the Parkes SAP undertaken in 2019 by technical experts, engineers, stakeholders and urban planners tested and finalised the environmental and planning studies to develop a Structure Plan (Jensen Plus, 2019), that in turn informed a Master Plan (DPIE, 2020). The technical studies that informed the Structure Plan identified a range of environmental impacts associated with the Parkes SAP, being air quality and odour; noise and vibration; groundwater; biodiversity; and Aboriginal heritage. The Parkes SAP is now in the delivery phase, led by RGDC. To supply electricity to the new SAP, a new 132kV powerline and 132/11kV ZS will need to be constructed. Essential Energy will be responsible for the delivery of this infrastructure. While the location of the new Brolgan ZS has been finalised, Essential Energy is currently continuing discussions with RGDC to refine and finalise the route for the powerline.

Other current or recently completed infrastructure projects in the Parkes region, which Essential Energy is currently aware of, include the Quorn Park 132kV Switching Station and Powerline Augmentation Work, Sunrise Mine 132kV Powerline, Parkes Bypass and Inland Rail Project.

The Quorn Park 132kV Switching Station (SS) and Powerline Augmentation Work is an Essential Energy project involving the construction, operation and maintenance a new 132kV SS, and augmentation of the existing 132kV powerline networks in the vicinity of Back Trundle Road, to the west of Parkes, and north of the Parkes SAP. The scope for the new SS includes construction of internal roads; site bench and drainage system; equipment footings for underground pits and conduits; an earth grid; fencing; establishment of two buildings for equipment and amenities; installation of various pieces of switchgear and electrical equipment; and installation of an on-site wastewater system. Powerline augmentation works include construction of two new sections of 132kV powerlines between the proposed new SS site and an existing 132kV powerline (feeder 300) approximately 1.2 kilometres (km) west. Each new section of 132kV powerline will comprise an overhead and underground component. A number of potential environmental impacts associated with this

project were avoided or reduced to acceptable levels during the design development and assessment stages. However, the REF identified that the project may still result in some impacts including air quality (dust), noise, vegetation, traffic, waste generation, and visual amenity during construction and operation. At the time of preparation of this report, the overhead powerline construction was largely complete, SS construction well underway and underground cable installation work recently commencing.

Sunrise Mine is also currently in the early planning stages and investigating route options for the construction of approximately 75km of a new 132kV overhead powerline between Parkes and the Sunrise Mine development, northwest of Parkes. It is proposed that this new 75km section of 132kV powerline will connect to the new Quron Park SS (currently under construction). The main potential environmental impacts from this proposal are likely to be similar in nature to those identified in this REF and that completed for the Quorn Park 132kV Switching Station (SS) and Powerline Augmentation Work, being biodiversity; Aboriginal heritage; construction noise; visual amenity; loss of / impact to agricultural land; and traffic during construction.

The Parkes Bypass involves relocating the Newell Highway about two kilometres west of its current alignment, between Maguire Road to the north and Barkers Road to the south – a total length of 10.5km. The main impacts identified in the REF prepared for the Bypass project (RMS, 2019) were traffic and transport; socio-economic; noise and vibration; biodiversity; erosion and sediment discharge; soil quality and contamination impacts; property impacts; and temporary loss of access to a travelling stock route.

The Parkes to Narromine section of the Inland Rail project was commissioned in late September 2020 and is now operational. The project involved the upgrade of 98.4km of existing rail track, including a full rebuild of the rail tracks, rail formation, and supporting structures along the rail corridor. The 5.3km stretch of new rail track near Parkes, known as the North West Connection, is also complete and has been transferred to ARTC Operations with trains now using the line (ARTC, 2023). The EIS prepared in support of the State Significant Infrastructure (SSI) application for the Parkes to Narromine section of the Inland Rail Project (GHD, 2017) identified the main environmental impacts to be traffic, transport and access; biodiversity; noise and vibration; air quality; soils and contamination; hydrology and flooding; water quality; Aboriginal and non-Aboriginal heritage; visual landscape; land use and property; and socio-economic impacts.

Based on the range of environmental impacts associated with the proposal subject to assessment in this REF, and the known existing and proposed developments in the locality, the potential for cumulative impacts related to the proposal include biodiversity; construction dust and noise; visual amenity; loss of / impact to agricultural land; and traffic impacts during construction. However, given the relatively small disturbance footprint and the localised extent of potential impacts during construction and operational phases of the proposal, the potential cumulative impact to other environmental factors during construction and operation of the proposal has been minimised to the greatest extent possible, and would not be significant. Any residual, minor impacts identified in this section of the REF can be mitigated and managed through the range of measures outlined in this section and summarised in **Table 13**.

6.17 Summary of Environmental Mitigation Measures

The environmental mitigation measures outlined in this document would be incorporated into the Project Construction Environmental Management Plan (CEMP). These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The mitigation measures are summarised in **Table 13**.

Table 13: Summary of Environmental Mitigation Measures

ASPECT	ENVIRONMENTAL MITIGATION MEASURE	TIMING
General	▸ All environmental mitigation measures must be incorporated within the Construction Environmental Management Plan (CEMP), or relevant works plan as applicable for the proposed works.	Pre-works.
General	▸ Environmental awareness training must be provided to all field personnel, contractors and subcontractors.	Pre-works and during works as required.
Consultation	▸ Consultation has been ongoing with RDGC regarding the siting of the ZS, to ensure the location is fit for purpose and poses the least land use conflict with the broader Parkes SAP. ▸ Landholder consultation regarding the overall PAP HVSP, in particular with the residents located along the Brolgan Road has commenced and is continuing. These residents would also be advised of the works schedule and provided with details of a site contact	Project planning and pre-works. Project planning, pre-works and during works.
Licences, Permits, Approvals and Notifications	▸ Notification to the local council and occupiers of adjoining land in accordance with clause 2.45 of *State Environmental Planning Policy (Transport and Infrastructure) 2021.* ▸ Notification to the local council in accordance with clause section 45 of the *Electricity Supply Act 1995.* ▸ A section 68 approval will be required from the local council for the installation of an on-site wastewater system. At a future date a separate section 68 approval may be required for connection to the local water a sewerage reticulation networks	21 days prior to works commencing. These notifications have been sent. 40 days prior to works commencing. This notification has been sent. Prior to commissioning of ZS, and as required.
Air Quality	▸ Any potential dust-borne materials transported to and from the activity site will be covered at all times during transportation ▸ Any exposed surfaces or temporary stockpiles of surplus excavated material will be covered or wet down during dry and windy conditions	During works.

	▸ All vehicles and machinery will be maintained according to manufacturer requirements to ensure emissions are kept within acceptable limits.	
Geology and Soil	▸ Risks associated with sediment and erosion will be managed in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004). In particular, controls including, but not limited to the following, will be implemented: › Diversion of upslope runoff around the proposal site in a way that minimises erosion, to be developed prior to bulk earthworks › Sediment control fences or other measures shall be installed at the downslope perimeter of disturbed areas, including any temporary stockpiles. › Maintenance of all erosion control measures at operational capacity until land is stabilised. ▸ A site specific erosion and sediment control plan should be included as part of the civil contractor's Construction Environmental Management Plan (CEMP). ▸ Disturbed areas will be stabilised as soon as practicable following construction activities ▸ Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for any surplus excavated materials.	During works.
Water Quality and Hydrology	▸ Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling ▸ Disturbed areas will be managed in accordance with the requirements of the Blue Book to minimise potential impacts to waterways. Sediment fencing will be erected, where required, downslope of disturbed areas, and impacts would be minimised where practicable. The use of filter bags may be required to discharge collected sediment-laden water where there are insufficient grassed areas available ▸ Any water collected in excavations and trenches during rainfall and surface water ingress should be pumped to a grassed area on-site (where a suitable area is available) to allow for infiltration, reused for dust suppression, or pumped to stormwater using a sediment sock. All options should be conducted in a manner that does not result in turbid water entering the stormwater system or nearby waterway.	During works.

Noise and Vibration	▸ Construction work that has the potential to create audible noise at the nearest sensitive receiver, will be between 7am and 6pm Monday to Saturday. On occasions works outside these hours may be undertaken where the following requirements are met: › Neighbours (and other sensitive receivers) adjacent to the works or the local council or the NSW Environment Protection Authority (EPA) have been notified; and › Where the works are required to take place in the vicinity of private access ways or driveways, consultation with individual residents would be undertaken to advise residents of the planned timing of the works. ▸ Any future commercial or light industrial receivers located in close proximity to the proposal will be advised of the works schedule and provided with details of a site contact. ▸ All plant and equipment will be operated and maintained in accordance with the manufacturer's specifications. ▸ Any noise complaint will be investigated with additional control measures put in place if required.	During works.
Flora and Fauna	▸ Limiting the disturbance of vegetation to the area assessed under this REF ▸ If fauna is detected within the worksite, the animal is to be allowed to leave the site without any coercion or a local wildlife rescue service is to be contacted to facilitate the safe removal of the animal from the worksite ▸ Essential Energy has a general biosecurity duty under the Biosecurity Act 2015 to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable. Field crews shall follow procedures as outlined in Essential Energy's Operational Guideline: Biosecurity Risk Management (CERM1000.96) to prevent, eliminate or minimise biosecurity risk so far as is reasonably practicable, with particular reference to vehicle and equipment hygiene practises.	Pre-works, during works and post works.
Aboriginal Heritage	▸ All construction work would be undertaken within the assessed areas of the proposal site only ▸ In the unlikely event that an Aboriginal heritage site or object is located during the construction phase of the project, works will cease in that area and a representative from Essential Energy's Environmental Services will be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken	During works.

	▸ If human remains are uncovered, works must immediately cease and the NSW Police department and Essential Energy's Environmental Services team will be notified.	
Non-Aboriginal Heritage	▸ All construction work would be undertaken within the assessed areas of the proposal site only ▸ In the unlikely event that a previously unknown heritage site or object is located during construction of the proposal, works would cease immediately in that area and a representative from Essential Energy's Environmental Services would be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken.	During works.
Contamination	▸ It is intended to reuse surplus spoil beneficially on site, where possible. ▸ Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for excavated materials ▸ In the event of encountering any suspected contamination in the work area, it will be separated and contained on site until it can be classified in accordance with the EPA (2014) Waste Classification Guidelines, and then disposed of at a facility that is lawfully able to accept the waste ▸ Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling ▸ Sediment and erosion control structures will be established and maintained in accordance with The Blue Book to minimise potential impacts on receiving watercourses.	During works.
Electric and Magnetic Fields	▸ The proposal will comply with all relevant national and international guidelines ▸ Siting the location of EMF generating equipment at least 370m away from the nearest sensitive residential receivers greatly minimises any potential residual EMF exposure risk	Project planning and design.
Visual	▸ Siting of the ZS generally away from sensitive residential receivers minimises potential views of the proposal from these receivers. ▸ The design has been sympathetic to the future surrounding building infrastructure and minimising direct views of certain pieces of electrical infrastructure from current vehicle traffic along Brolgan Road, as well as current and future commercial / industrial receivers.	Project planning and design.

Waste	▸ All wastes that are generated as a result of the project will be classified in accordance with the Waste Classification Guidelines (EPA, 2014) ▸ All waste material will be reused, recycled, or disposed of at a facility lawfully capable of receiving the waste	During works.
Bushfire	▸ Ongoing vegetation maintenance would occur to ensure safe clearance distances are maintained around the ZS perimeter.	Post construction
Traffic and Access	▸ The need for a traffic management plan (TMP) for the construction phase would be determined in consultation with RGDC and, if required, completed prior to works commencing. The TMP would outline requirements for the safe and continued use of local transport corridors during construction	Pre-works and during works.
Land Use	▸ Consultation about the proposed works and schedule will be undertaken with nearby residential receivers, where required ▸ The site should be left in a tidy condition at the conclusion of construction activities.	During works.
Social and Economic	▸ Management of construction traffic in the vicinity of construction works, including communication with existing local residents and road users ▸ Signs and barriers would be erected around construction work sites, where appropriate, to minimise the possibility of personnel injuries and prevent placing the public at risk.	Pre-works and during works.

7. Ecologically Sustainable Development

Ecologically sustainable development (ESD) is an attempt to provide the best outcomes for the human and natural environments both now and into the indefinite future. One of the most often cited definitions of sustainability is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". Sustainability relates to the continuity of economic, technical, social, institutional and environmental aspects of human society, as well as the non-human environment.

The existing environment has been described throughout **Section 6** of this REF for the various aspects of the natural environment assessed as part of this proposed activity.

The proposal has been assessed against the following four principles of ESD listed in the Protection of the Environment Administration Act 1991.

The four principles of ESD are:

- The precautionary principle: section 6(2)(a)(i)(ii)
- The principle of inter-generational equity: section 6(2)(b)
- The principle of biological diversity and ecological integrity: section 6(2)(c)
- The principle of improved valuation of environmental resources: section 6(2)(d)(i)(ii)(iii).

An assessment of the proposal against the principles is provided below.

7.1 Precautionary Principle

The precautionary principle states that:

'If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

1) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and

2) an assessment of the risk weighted consequence of various options.'

For the precautionary principle to be applicable, two pre-conditions must be satisfied; "*first it is not necessary that serious or irreversible environmental damage has actually occurred – it is the threat of such damage that is required. Secondly, the environmental damage threatened must attain the threshold of being serious or irreversible*"[1].

If there is no threat of serious or irreversible environmental damage, there is no basis upon which the precautionary principle can apply.

Environmental investigations, including desktop ecological, Aboriginal due diligence, and visual impact assessments, supported by site inspections, have been undertaken during the preparation of this REF to ensure that the potential environmental impacts are understood with a high degree of certainty. The spatial scale of impacts would be local and isolated to the immediate construction area. Therefore, it can be concluded that this proposal will not result in a threat of serious or irreversible damage.

Mitigation measures have also been proposed in this REF to minimise the identified potential impacts of the project. A Construction Environmental Management Plan (CEMP) will be developed and implemented as a precautionary measure, and no mitigation measures have been deferred due to a lack of scientific certainty. The proposal is therefore consistent with the precautionary principle.

[1] Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC 133, Preston CJ at 129

7.2 Principle of Inter-generational Equity

The principle of inter-generational equity states that:

'The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.'

To the extent possible, all environmental impacts and appropriate mitigation measures have been identified. The proposal would not harm the health, diversity and productivity of the environment to such an extent that future generations would not be able to benefit.

The proposal is therefore consistent with the principle of inter-generational equity.

7.3 Principle of Biological Diversity and Ecological Integrity

The principle of biological diversity and ecological integrity states that:

'*Conservation of biological diversity and ecological integrity should be a fundamental consideration.*'

The proposal comprises the construction of a new Brolgan ZS on cleared land historically used for cropping and grazing. A desktop ecological impact assessment, supported by site inspections has been prepared, which concluded the proposal will not result in a significant impact to the ecological values present in the proposal site. Impacts upon ecological integrity would therefore be negligible, as described in **Section 6.5.**

7.4 Improved Valuation of Environmental Resources

The principle of improved valuation of environmental resources states that:

'*Environmental factors should be included in the valuation of assets and services such as:*

- *Polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance and abatement*
- *The users of goods and services should pay prices based on the full life cycle of costs of providing those goods and services, including the use of natural resources and assets and the ultimate disposal of any waste*
- *Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise cost to develop their own solutions and responses to environmental problems.'*

The proposal has been designed taking into consideration the least possible impact on the environment. All costs associated with the containment, avoidance and abatement of pollution have been factored into the design of this proposal.

8. Construction Environmental Management Plan

8.1 Introduction

A Construction Environmental Management Plan (CEMP) outlines the environmental objectives of a project, the environmental mitigation measures to be implemented, the timing of implementation, responsibilities for implementation and management, and a review process to determine the effectiveness of the strategies.

The construction contractor(s) would be required to develop a project-specific CEMP that addresses the scope of works to be undertaken. The CEMP would detail how the works would be undertaken to comply with all environmental laws, Essential Energy's environmental policy, and the environmental mitigation measures described in this REF.

The key objectives of the CEMP would include:

- Ensuring that the works are carried out in accordance with legislative requirements and relevant non-statutory policies
- Ensuring that the works are carried out in accordance with the requirements detailed in this REF, including all requirements outlined in any relevant approvals, permits or licences and the mitigation measures described in Section 6
- Ensuring that employees engaged to undertake the works comply with the conditions detailed in the CEMP
- Identifying management responsibilities and reporting requirements to demonstrate compliance with the CEMP

It is also noted that the CEMP would be a working document and may be amended over the course of the project.

If a particular activity falls outside the scope of the REF and CEMP, and it would increase the environmental impact, the activity is not permitted to continue without an appropriate environmental assessment under the EP&A Act.

8.2 Implementation of the CEMP

The CEMP would be a working document and would be amended should strategies initially implemented be found to be inadequate to manage environmental impacts. The CEMP would typically:

- Establish environmental goals and objectives
- Detail the conditions of approval
- List actions, timing and responsibilities for implementation that arise from the mitigation measures recommended in this REF
- Detail statutory requirements
- Provide a framework for reporting on relevant matters on an ongoing basis
- Detail training requirements for personnel in environmental awareness and best practice environmental management systems
- Outline emergency procedures, including contact names and corrective actions
- Detail process surveillance and auditing procedures
- List complaint handling procedures

- Detail quality assurance procedures.

8.2.1 AUDITING SCHEDULE OF THE CEMP

Auditing of the proposal would be undertaken to establish whether the contractor is conducting activities in accordance with their current environmental management plans and whether the management plans are providing an effective tool to control adverse environmental impacts.

The following activities are proposed to achieve the audit's purpose:

- Review the on-site implementation of the contractor's CEMP
- Review the documentation process to determine if planned works have received endorsement to proceed
- Monitor the compliance of construction activities with the project determination and environmental legislation
- Review the outcomes of any previous audit(s) and determine if there has been any change in the environmental performance of the construction contractor
- Identify opportunities to improve on-site environmental management practices.

The benefits of conducting the environmental audit are to allow:

- Feedback on the CEMP implementation process to assist both the contractor and project manager to improve the future preparation of site environmental management documentation
- Improve the planning of construction projects through documentation and impact assessment to ensure best environmental management practices are implemented on site
- Improve environmental management processes on site.

9. Environmental Checklist

In accordance with section 5.5 of the EP&A Act and clause 171 of the EP&A Reg when assessing the environmental impact of an activity on the environment, Essential Energy must consider the factors identified in **Table 14** and **15** below.

Table 14: Section 5.5 requirements

REQUIREMENT	SECTION REFERENCE
For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity	Section 2, 6, 7 and 8
Without limiting the above, a determining authority shall consider the effect of an activity on any wilderness area (within the meaning of the *Wilderness Act 1987*) in the locality in which the activity is intended to be carried on	N/A – there are no wilderness areas within or close to the activity area

Table 15: Clause 171 Checklist

SECTION 171	SECTION REFERENCE
The environmental impact on a community *The works are located in what is currently a predominately rural landscape, and on land that will become a future enterprise precinct of the broader Parkes SAP development site. Impacts on the community have been considered by this REF. These include noise, dust, social and visual impacts. With the exception of noise and visual, these have been assessed to be low. Noise and visual impacts have been assessed as moderate in the short term and low/minor over the long term*	Sections 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13 6.14 and 6.15
The transformation of a locality *In the short term there will be a high degree of visual change associated with site preparatory works, civil works and construction of the ZS. Over the longer term the ZS will also be a permanent change in the visual landscape, however, some degree of integration will occur as other the commercial buildings making up the balance of the enterprise precinct are established. While much larger transformation of the locality will occur as a result of the broader SAP development, the contribution of the ZS is not considered significant.*	Sections 6.10, 6.14 and 6.15
The environmental impact on the ecosystems of the locality *The proposed ZS will be located within the existing cleared and heavily modified and disturbed land. Impacts to threatened species, populations and ecological communities from the construction, operation and maintenance of the ZS have been assessed in this REF, and will be negligible to nil, and not likely to result in a significant impact.*	Sections 6.5 and 7.

Reduction of the aesthetic, recreational, scientific, or other environmental quality or value of a locality *An overall reduction in aesthetic and recreational quality of the locality is unlikely to occur during the proposed works. Localised impacts may occur at the construction site, however these impacts will be temporary and of short duration, and can be managed through implementation of mitigation measures in this REF.*	Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.14, 6.15 and 6.16
The effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations *No sites of Aboriginal heritage will be impacted by the proposal. An Aboriginal heritage due diligence assessment was undertaken in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (NSW DECCW, 2010). This assessment concluded that considering the highly disturbed nature of the proposal site, the distance from known Aboriginal heritage sites that remain in-situ, and the mitigation measures proposed in Section 6.6.3, the proposal is not likely to impact Aboriginal heritage.* *A review of non-Aboriginal heritage databases, registers and LEPs indicated no sites of world, national, state, or local heritage were located at or within close proximity to the proposal site.*	Sections 6.6, 6.7
The impact on the habitat of protected fauna (within the meaning of the *Biodiversity Conservation Act 2016*) *The proposed activity is not likely to significantly impact threatened fauna species and their habitat.*	Section 6.5
The endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air *It is not anticipated that the proposal will endanger any species of animal, plant or other form of life, whether living on land, in water, or in the air.*	Section 6.5
Long-term effects on the environment *Long-term adverse environmental effects are not anticipated.*	Sections 6 and 7
Degradation of the quality of the environment *This risk is considered low with the implementation of the management measures included in this REF.*	Sections 6.1, 6.2, 6.3, 6.5 and 6.8.
Risk to the safety of the environment *There is the potential risk to the environment from spillage of materials during construction of the proposal. Implementation of the mitigation measures contained in Section 6 of this REF will ensure that potential environmental risks are minimised.*	Sections 6.1, 6.2, 6.3, 6.8, 6.11, 6.12, 6.13, 6.14 and 7.
Reduction in the range of beneficial uses of the environment	Section 6 and 7

No long-term reduction in the range of beneficial uses of the environment is anticipated as a result of the proposal.	
Pollution of the environment *Risk of pollution to the environment is considered low and can be managed with implementation of mitigation measures provided in this REF.*	Section 6
Environmental problems associated with the disposal of waste *Waste generated by the proposed works will be minor. All wastes that are generated by the project will be appropriately disposed of in accordance with the Waste Classification Guidelines (EPA, 2014).*	Section 6.11
Increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply *The proposal is unlikely to increase demands upon rare natural resources.*	Section 6
The cumulative environmental effect with other existing or likely future activities *Based on the range of environmental impacts associated with the proposal subject to assessment in this REF, and the interaction of elements within or in connection with the proposal, or with other existing or proposed developments within the locality, the potential for some cumulative impacts exists. However, given the relatively small disturbance footprint and the localised extent of potential impacts during construction and operational phases of the proposal, the potential cumulative impact to other environmental factors during construction and operation of the proposal has been minimised to the greatest extent possible, and would not be significant. Any residual, minor impacts identified in this section of the REF can be mitigated and managed through the range of measures outlined in this Chapter 6 and summarised in* ***Table 13.***	Section 6.16
The impact on coastal processes and coastal hazards, including those under projected climate change conditions *The proposal is not located on the coast.*	Section 3.3 and 6.3
Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1 *Grid electricity connection works are identified in both the Parkes SAP Master Plan (DPIE, 2020) Parkes Special Activation Precinct Draft Structure Plan (Jensen Plus. 2019), and the Parkes Special Activation Precinct Delivery Plan September 2024 (RGDC, 2024).* *The proposal would also support the push for renewables, including solar power, and connections into the National Electricity Grid outlined as part of the vision in the Parkes Shire Local Strategic Planning Statement 2020 (PSC, 2020). The proposal, in part, will also support Planning Priority 5 of the same document, by providing adequate infrastructure to service the Parkes National Logistics Hub Special Activation Precinct. Furthermore, the proposal, through the connection of a new solar farm, supports Objective 2 of the Central West and Orana Regional Plan 2041 (DPE, 2022b) by supporting the*	Section 6.15

State's transition to Net Zero by 2050 and deliver the Central–West Orana Renewable Energy Zone.

Other relevant environmental factors *No other relevant environmental factors have been identified during the preparation of this REF*	N/A

10. Conclusion

This REF has been prepared to assess the environmental impacts associated with the construction, operation and maintenance of the new Brolgan 132/11kV ZS. Essential Energy is a determining authority as defined in the EP&A Act. As such, the activity has been assessed under Part 5, Division 5.1 of the EP&A Act.

The proposal would enable the upgrade of the local electricity network to both support the Parkes SAP development and increase overall network capacity, placing Essential Energy in a better position to meet customers' future electricity needs.

The proposal complies with the provisions of section 5.5 of the EP&A Act and clause 171 of the EP&A Reg as shown in **Section 9**.

The proposal and its associated environmental impacts are unlikely to have a significant impact on the environment. In conjunction with the new high voltage powerline, making up the other component of the PAP HVSP, the proposal would support the Parkes SAP development, and strengthen Essential Energy's electricity network in the broader area, maximising the social and economic benefits, whilst minimising any adverse environmental impacts.

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Appendix A: Design Plans

BROLGAN ROAD, PARKES ZONE SUBSTATION

BULK EARTHWORKS, BENCHING AND ACCESS

CIVIL ENGINEERING DESIGN

DRAWING SCHEDULE

DRAWING No.	DRAWING TITLE
501-001	COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
501-002	GENERAL NOTES AND SPECIFICATIONS
501-003	CONSTRUCTION DETAILS
501-004	GENERAL ARRANGEMENT PLAN
501-005	BULK EARTHWORKS PLAN
501-006	ROAD PLAN & LONGSECTION
501-007	CROSS SECTIONS ROAD 1 - SHEET 1
501-008	CROSS SECTIONS ROAD 1 - SHEET 2
501-009	DRAINAGE PLAN
501-010	SEDIMENT & EROSION CONTROL PLAN

LOCALITY PLAN

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE		PROJECT No.	805896	COMMENTS	DESIGNED	G.Every	BROLGAN 132/11kV ZONE SUBSTATION COVER SHEET LOCALITY PLAN AND DRAWING SCHEDULE CIVIL DRAWING	© 2019 Essential Energy			
DATE OF ISSUE	27/09/2024				DRAWN	T.Close		SUPERSEDES:			
PURPOSE OF ISSUE	COMMENT				REVIEWED	M.Turvey		DRAWING NUMBER	BRN501	SHT	1/10
					APPROVED	J.Streatfeild				VER	A

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GENERAL

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT PROJECT DOCUMENTATION INCLUDING BUT NOT LIMITED TO, THE REVIEW OF ENVIRONMENTAL FACTORS (REF), THE GEOTECHNICAL INVESTIGATION REPORT, RELEVANT STANDARDS & SPECIFICATIONS AND ANY OTHER DRAWINGS. ANY DISCREPANCIES, DOUBT OR CONFLICT SHALL BE REFERRED TO THE PRINCIPALS AUTHORISED PERSON FOR CLARIFICATION AND DIRECTION PRIOR TO CONSTRUCTION.
2. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON-SITE PRIOR TO CONSTRUCTION. DO NOT OBTAIN DIMENSIONS BY SCALING THESE DRAWINGS.
4. ORIGIN OF LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD) UNLESS NOTED OTHERWISE.
5. THE CONTRACTOR SHALL OBTAIN ALL PERMISSIONS AND APPROVALS AS NECESSARY PRIOR TO CONSTRUCTION.
6. ALL MATERIALS & WORKMANSHIP SHALL BE IN ACCORDANCE WITH CURRENT RELEVANT AUSTRALIAN STANDARDS, REGULATIONS, NATIONAL CONSTRUCTION CODE, GUIDELINES AND INDUSTRY STANDARD BEST PRACTICES.
7. SETOUT INFORMATION TO BE PROVIDED BY ESSENTIAL ENERGY IN ELECTRONIC FORMAT UPON REQUEST TO THE ENGINEERING SURVEYOR AT THE TIME OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ALL SURVEY SETOUT AND IS TO BE UNDERTAKEN BY A REGISTERED SURVEYOR OR APPROVED ENGINEERING SURVEYOR.
8. NO VEGETATION SHALL BE REMOVED WITHOUT PRIOR APPROVAL OF THE SUPERINTENDENT UNLESS NOTED ON THE DRAWINGS OR SCHEDULED IN THE REVIEW OF ENVIRONMENTAL FACTORS (REF). CONTRACTOR IS TO ESTABLISH TREE PROTECTION ZONES AROUND EXISTING TREES PRIOR TO COMMENCEMENT.
9. AN EROSION AND SEDIMENTATION CONTROL PLAN IN ACCORDANCE WITH THE "BLUE BOOK" MUST BE PREPARED AND IMPLEMENTED BY THE CONTRACTOR PRIOR TO AND MAINTAINED DURING CONSTRUCTION. THE "BLUE BOOK" REFERS TO THE DEPARTMENT OF HOUSING PUBLICATION, "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION".
10. THE CONTRACTOR SHALL DESIGN (BY A SUITABLY QUALIFIED PERSON), OBTAIN APPROVAL (FROM RELEVANT AUTHORITY) AND IMPLEMENT TEMPORARY TRAFFIC CONTROL MEASURES AS REQUIRED, IN ACCORDANCE WITH ALL RELEVANT AUTHORITY REQUIREMENTS.
11. AS CONSTRUCTED DETAILS SHALL BE RECORDED BY A REGISTERED SURVEYOR OR APPROVED ENGINEERING SURVEYOR AT THE CONTRACTOR'S COST. AS CONSTRUCTED DETAILS SHALL BE SUBMITTED TO THE SUPERINTENDENT PRIOR TO PRACTICAL COMPLETION.

EXISTING SERVICES & INFRASTRUCTURE

1. THE LOCATION AND DEPTH OF SERVICES SHOWN ON THESE PLANS HAVE BEEN ESTABLISHED BY FIELD OBSERVATION AND/OR FROM RELEVANT SERVICE AUTHORITY PLANS AND ARE TO BE CONSIDERED AS INDICATIVE ONLY. PRIOR TO CONSTRUCTION, THE ACTUAL DEPTH AND LOCATION OF ALL SERVICES ARE TO BE CONFIRMED BY THE CONTRACTOR BY APPROPRIATE MEANS, AND BY LIAISON WITH THE RELEVANT SERVICE AUTHORITY.
2. NOT ALL EXISTING SERVICES INFORMATION MAY BE SHOWN DUE TO LACK OF ACCESS, VISIBILITY AND/OR UNAVAILABILITY OF SERVICE AUTHORITY PLANS.
3. HAND EXCAVATION ONLY (NO MECHANICAL EXCAVATIONS) SHALL BE UNDERTAKEN OVER ELECTRICAL, GAS, COMMUNICATION AND/OR WATER SERVICES.
4. ENSURE ESSENTIAL ENERGY ASSETS ARE PROTECTED/MAINTAINED AT ALL TIMES. ALL DAMAGE TO ESSENTIAL ENERGY ASSETS SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF ESSENTIAL ENERGY AT NO COST TO ESSENTIAL ENERGY.
5. ENSURE A SMOOTH TRANSITION FREE FROM ABRUPT CHANGE WHERE NEW WORKS ABUT EXISTING.
6. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS (PAVED, COVERED, GRASSED AND LANDSCAPED AREAS, ROAD PAVEMENTS, FOOTPATHS AND KERBS ETC) TO THEIR ORIGINAL CONDITION (OR AS DIRECTED BY THE SUPERINTENDENT) ON COMPLETION OF WORKS.
7. ENSURE THAT AT ALL TIMES SERVICES TO ANY BUILDINGS AND INFRASTRUCTURE NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.

SURVEY

1. ANY STATE SURVEY MARK (E.G. PM, SS ETC) OR BOUNDARY REFERENCE MARK MUST NOT BE DESTROYED OR DAMAGED UNLESS THE MARKS ARE ASSESSED BY A REGISTERED SURVEYOR AND APPROVAL HAS BEEN GIVEN BY THE SURVEYOR GENERAL. ALL OTHER SURVEY MARKS ARE NOT TO BE DISTURBED OR DESTROYED UNTIL ASSESSED BY THE SITE SURVEYOR.
2. ANY STATE SURVEY MARK (E.G. PM, SS ETC.) THAT HAS APPROVAL TO BE DESTROYED IS TO BE REPLACED WITH ANOTHER STATE SURVEY MARK AS PER THE SURVEYOR GENERALS DIRECTION NO. 11: PRESERVATION OF SURVEY INFRASTRUCTURE, AND ANY CONDITION OUTLINED IN THE SURVEYOR GENERAL'S APPROVAL AT CONTRACTORS COST.
3. A PLAN OF SURVEY INFORMATION ONLY MUST BE PREPARED BY A REGISTERED SURVEYOR AT THE CONTRACTORS COST PRIOR TO ANY BOUNDARY REFERENCE MARK BEING DESTROYED OR DISTURBED.
4. THE CONTRACTOR SHALL CHECK SUSTAINABILITY OF THE STATED COORDINATES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
5. ONLY ESTABLISHED STATE SURVEY MARKS ARE TO BE USED TO ESTABLISH HORIZONTAL AND HEIGHT CONTROL UNLESS THE MARK HAS BEEN APPROVED BY PRINCIPAL'S AUTHORISED PERSON PRIOR TO CONSTRUCTION.
6. THE POSITION OF ANY SURVEY MARKS WITHIN 1.0 METRE OF CONSTRUCTION ARE TO BE IDENTIFIED ON SITE AND ADEQUATELY PROTECTED FROM INADVERTENT DAMAGE.

EARTHWORKS

1. THESE PLANS ARE TO BE READ IN CONJUNCTION WITH AS 3798 AND GEOTECHNICAL INVESTIGATION REPORT BY FORTIFY GEOTECH, DATED 26 SEPTEMBER 2024 (REFERENCE AP/C15308).
2. SITE FENCING, DRAINAGE AND EROSION & SEDIMENTATION CONTROL TO BE ESTABLISHED PRIOR TO ANY EARTHWORKS ON SITE. DUST GENERATION IS TO BE CONTROLLED AT ALL TIMES DURING CONSTRUCTION.
3. ALL VEGETATIVE MATTER TO BE STRIPPED AND REMOVED FROM THE CUT / FILL AREA, STRIP TOPSOIL & UNCONTROLLED FILL AND STOCKPILE SEPARATELY FOR LATER REUSE, GRUB OUT ALL ROOTS GREATER THAN 75mm DIAMETER TO 500mm BELOW SUBGRADE OR FOUNDATION LEVEL AND BACKFILL WITH APPROVED SELECT MATERIAL. THE MAXIMUM HEIGHT OF STOCKPILED MATERIAL SHALL NOT EXCEED 2.5m AND MAXIMUM BATTER SLOPE SHALL NOT EXCEED 1V:2H.
4. IN AREAS TO BE FILLED SCARIFY AND COMPACT THE EXPOSED GROUND SURFACE TO MIN 150mm DEPTH. PROOF ROLL AND REMOVE ALL SOFT, WET OR UNSUITABLE MATERIAL.
5. IN FINAL BENCH AREAS WHERE CUT SURFACE IS THE FINISHED SURFACE LEVEL RIP AND RECOMPACT SURFACE TO A DEPTH OF 300mm. PROFF ROLL AND REMOVE ALL SOFT, WET OR UNSUITABLE MATERIAL.
6. PRIOR TO PLACEMENT OF FILL SLOPING GROUND GREATER THAN 1V:8H IS TO BE BENCHED TO A DEPTH NOT LESS THAN 100mm HOWEVER GENERALLY IN THE ORDER OF 300mm DEPENDANT UPON THE SLOPE OF THE GROUND.
7. CONTROLLED FILL SHALL BE APPROVED SUITABLE SITE WON MATERIAL OR APPROVED IMPORTED SELECT MATERIAL, FREE OF ORGANIC MATERIAL AND PARTICLE SIZES GREATER THAN 75mm COMPACTED IN LAYERS NOT EXCEEDING 200mm TO NOT LESS THAN 98% STD MDD AT ABOUT OMC.
8. IMPORTED MATERIALS SHOULD BE OF VIRGIN EXCAVATED NATURAL MATERIALS OR CERTIFIED CONTAMINATION FREE EXCAVATED NATURAL MATERIAL, BE FREE FROM ORGANIC MATERIAL WITH LOW PI BETWEEN 6-15%, LIQUID LIMIT < 50%, CBR > 8, CONTAINING BETWEEN 10 - 80% FINES LESS THAN 0.075mm IN SIZE (SILT AND CLAY) AND MAXIMUM PARTICLE SIZE 75mm.
9. MINIMUM RELATIVE COMPACTION (%):

LOCATION	MIN DRY DENSITY RATIO (1) (COHESIVE SOIL)	MIN DENSITY INDEX (2) (COHESIONLESS SOIL)
COMMERCIAL (ESSENTIAL ENERGY SUBSTATION BENCHES)	98%	75%
FILL TO SUPPORT PAVEMENTS - GENERAL FILL	95%	70%
FILL TO SUPPORT PAVEMENTS - SUBGRADE (TO A DEPTH OF 300mm)	98%	75%

(1) MINIMUM DRY DENSITY RATIO DETERMINED IN ACCORDANCE WITH AS1289.5.4.1
(2) MINIMUM DENSITY INDEX DETERMINED IN ACCORDANCE WITH AS1289.5.6.1

10. FILL PLACEMENT AND CONTROL TESTING TO BE OVERVIEWED AND CERTIFIED BY A GEOTECHNICAL ENGINEER AT LEVEL 1 INVOLVEMENT AS PER AS 3798. FIELD DENSITY TESTING AS PER TYPE 1 EARTHWORKS IN TABLE 8.1 OF AS 3798.
11. FINAL EARTHWORKS BATTER SLOPES TO HAVE A ROUGHENED SURFACE TO REDUCE RUNOFF VELOCITY AND AID REVEGETATION.
12. EXCESS FILL SHALL BE REMOVED FROM SITE AND DISPOSED OF IN A LAWFUL MANNER AT THE CONTRACTORS COST.
13. ANY CONTAMINATED MATERIAL SHALL BE MANAGED AND DISPOSED OF ACCORDING TO LOCAL AUTHORITY AND EPA REQUIREMENTS (AT CONTRACTORS COST WHERE KNOWN PRIOR TO COMMENCEMENT).
14. ALL DISTURBED SURFACES AND BATTERS OUTSIDE THE FINAL BENCH AREA SHALL USE SITE WON CLAY AS A CAPPING LAYER (WHERE AVAILABLE), HAVE A MINIMUM OF 150mm TOPSOIL APPLIED AND BE HYDROMULCHED WITH AN APPROVED SEED MIX APPROPRIATE FOR THE LOCALITY. BATTERS STEEPER THAN 1:4 SHALL HAVE EROSION CONTROL MATTING PLACED PRIOR. EXCESS SITE WON ROCK MAY BE USED AS EROSION CONTROL ON BATTERS WHERE THEY DO NOT POSE A SAFETY RISK.

STORMWATER

1. ALL DRAINAGE PIPES TO BE CLASS SN8 POLYPROPELYENE SUCH AS BLACKMAX, STORMPRO OR APPROVED EQUIVALENT UNLESS OTHERWISE NOTED.
2. ALL DRAINAGE PIT ACCESS COVERS AND GRATES TO BE CLASS B IN SWITCHYARD NON TRAFFICABLE AREAS AND CLASS D IN TRAFFICABLE AREAS IN ACCORDANCE WITH AS 3996.
3. STORMWATER PITS AND HEADWALLS ARE TO BE CUSTOM PRECAST ONLY SUBJECT TO THE FOLLOWING:
   - PITS MUST BE CUSTOM MADE AND INCLUDE ALL PENETRATIONS CAST INTO THE PIT AT TIME OF MANUFACTURE AT THE CORRECT HEIGHT, SIZE AND ORIENTATION. KNOCK OUT STYLE PRECAST PITS ARE NOT PERMITTED.
   - PITS MUST BE DES:GNED AND CERTIFIED BY A SUITABLY QUALIFIED STRUCTURAL ENGINEER TO COMPLY WITH THE RELEVANT PROVISIONS OF AS 3600 CONCRETE STRUCTURES.
   - PITS MUST BE RATED BY THE MANUFACTURER FOR THE PRVAILING LOAD AND EXPOSURE CLASSIFICATION.
   - CULVERT JOINTS MUST PROVIDE A WATERTIGHT SEAL.
   - PITS SHALL HAVE A DESIGN LIFE IN EXCESS OF 80 YEARS.
4. ALL REINFORCED CONCRETE STORMWATER PITS OR STRUCTURES BELOW 1.9m AHD SHALL HAVE SALT WATER COVER.
5. EXCAVATION, BEDDING AND BACKFILL TO BE IN ACCORDANCE WITH THE SELECTED PIPE MANUFACTURERS RECOMMENDATIONS.
6. GROUTED STONE PITCHED SCOUR PROTECTION IS REQUIRED AT ALL STORMWATER DISCHARGE LOCATIONS.
7. SUBSOIL DRAINAGE IN ROADS OR ACCESS WAYS WHERE INDICATED ON PLANS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
8. OPEN DRAINS AROUND BENCH TO BE SHOTCRETE LINED TO MIN. 1m HEIGHT OR TO THE TOP OF BENCH (WHICHEVER IS GREATER).

REFERENCES

AS 1726 - GEOTECHNICAL SITE INVESTIGATIONS
AS 3798 - GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS
AS 3996 - ACCESS GRATES AND COVERS

CONCRETE

1. ALL WORKMANSHIP & MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600.
2. CONCRETE PROPERTIES AND COVER TO REINFORCING:

ELEMENT	SLUMP (mm)	MAX. AGGREGATE SIZE (mm)	F'c AT 28 DAYS (MPa)	MAX. 56 DAY DRY SHRINKAGE (STRAIN)	COVER (mm)	EXPOSURE CLASS.
BUND WALL/SLAB	80	20	25	650 MICRONS	50	A2
FOOTINGS	80	20	N32	650 MICRONS	50	A2
PAD FOOTINGS	80	20	N32	-	50	-
PIERS	100	20	N32	650 MICRONS	60	A2
SLAB ON GROUND (NON TRAFFICABLE)	80	20	25	650 MICRONS	TOP 40 BTM 40	B1

3. ALL CONCRETE MIXES SHALL BE DESIGNED BY A RECOGNISED TESTING LAB.
4. ADMIXTURES SHALL NOT BE USED IN CONCRETE WITHOUT WRITTEN APPROVAL FROM THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
5. COMPACT ALL CONCRETE USING A SUITABLY SIZED MECHANICAL VIBRATOR.
6. ALL CONCRETE SHALL BE CONTINUOUSLY CURED FOR A MINIMUM OF 7 DAYS AFTER PLACEMENT. CURING SHALL COMMENCE IMMEDIATELY AFTER FINISHING.
7. CONCRETE PROFILES:
   - ALL FORMED AND UNFORMED EXPOSED SURFACES SHALL HAVE A CLASS 2 FINISH IN ACCORDANCE WITH AS3610.
   - SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
   - NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL FROM THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
   - CONDUITS, PIPES ETC SHALL NOT BE PLACED WITHIN CONCRETE COVER.
8. TEST REPORT(S) / DELIVERY DOCKET(S) FROM THE CONCRETE BATCH PROCESSING PLANT CONFIRMING THE CONCRETE CHARACTERISTIC COMPRESSIVE STRENGTH AND SLUMP SHALL BE PROVIDED TO ESSENTIAL ENERGY.
9. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED & USED ONLY WHERE SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE CIVIL ENGINEER. PLACE CONCRETE CONTINUOUSLY BETWEEN CONSTRUCTION JOINTS. DO NOT BREAK OR INTERRUPT SUCCESSIVE POURS SUCH THAT COLD JOINTS OCCUR.
10. FALLS IN THE SLAB ARE SHOWN ON THE DRAWINGS. MINIMUM SLAB THICKNESSES SHALL BE MAINTAINED IN SLABS WITH FALL.
11. SETDOWNS OR FALLS IN FLOOR SURFACES ARE NOT PERMITTED UNLESS SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY ESSENTIAL ENERGY STRUCTURAL ENGINEER.
12. REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND IS NOT NECESSARILY SHOWN IN THE TRUE POSITION.
13. SITE BENDING OF REINFORCEMENT BARS SHALL BE DONE USING SUITABLE BENDING TOOL, WITHOUT HEATING.
14. ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS PROVIDED AT MAXIMUM 1m CENTRES EACH WAY. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.
15. MESH REINFORCEMENT SHALL BE LAPPED A MINIMUM OF 2 CROSS WIRES + 25mm.
16. STEEL REINFORCEMENT IS TO BE ELECTRICALLY CONNECTED TO THE EARTH GRID WHERE SPECIFIED.
17. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
18. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
19. REINFORCEMENT SYMBOLS:

N - NORMAL DUCTILITY, STRENGTH GRADE 500MPa, DEFORMED BAR TO AS 4671.
R - NORMAL DUCTILITY, STRENGTH GRADE 250MPa, PLAIN ROUND BAR TO AS 4671.

NOTE: THE NUMBER FOLLOWING THE BAR SYMBOL N AND R IS THE NOMINAL BAR DIAMETER IN MILLIMETRES.

20. ALL REINFORCING BARS SHALL BE D500N AND ALL REINFORCING MESH SHALL BE D500L TO AS4671 UNLESS NOTED OTHERWISE OR AS OTHERWISE APPROVED BY THE ESSENTIAL ENERGY STRUCTURAL ENGINEER.
21. FORMWORK SHALL BE DESINGED & CONSTRUCTED IN ACCORDANCE WITH AS 3610 - 199.
22. ALL PENETRATIONS TO HAVE 2/N16 TRIMMER BARS TOP AND BOTTOM TO EACH FACE UNLESS NOTED OTHERWISE. BARS SHALL EXTEND MINIMUM 600mm BEYOND PENETRATION.

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CAD File: BRN501-002.dgn

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE		PROJECT No.	805896	COMMENTS	DESIGNED	G.Every	
DATE OF ISSUE	27/09/2024				DRAWN	T.Close	
PURPOSE OF ISSUE	COMMENT				REVIEWED	M.Turvey	
					APPROVED	J.Streatfeild	

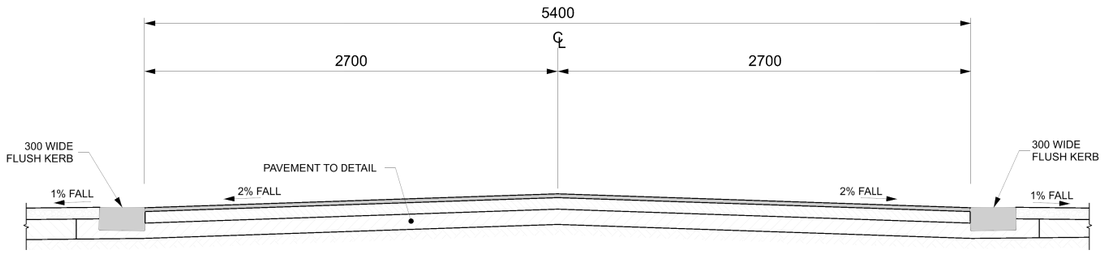
BROLGAN
132/11kV ZONE SUBSTATION
GENERAL NOTES AND SPECIFICATIONS

CIVIL DRAWING

SUPERSEDES:

essential energy

DRAWING NUMBER	SHT	VER
BRN501	2/10	A



INTERNAL ACCESS ROAD TYPICAL SECTION
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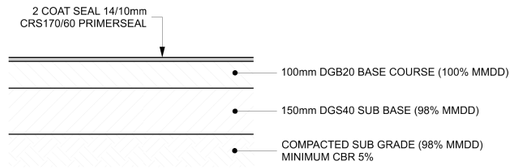

TYPICAL PAVEMENT DETAIL
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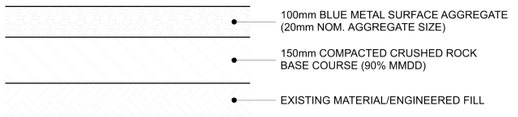
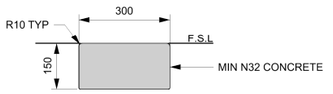
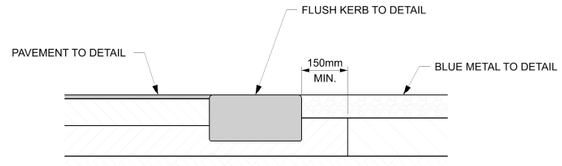


BLUE METAL SWITCHYARD DETAIL
SCALE 1:10



PROVIDE 10 WIDE x 20 DEEP TOOLED
CONTROL JOINTS AT 3000 CENTRES & 15
WIDE BITUMINIOUS FIBREBOARD EXPANSION
JOINTS AT INTERVALS NOT EXCEEDING 15m

FLUSH KERB DETAIL
SCALE 1:10



PAVEMENT TO BLUE METAL INTERFACE DETAIL
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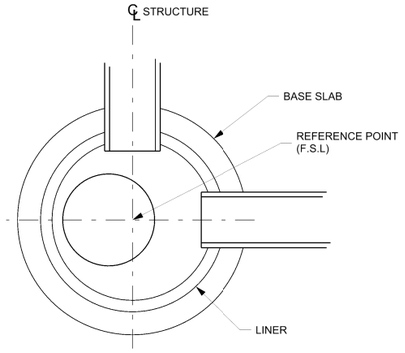

PLAN
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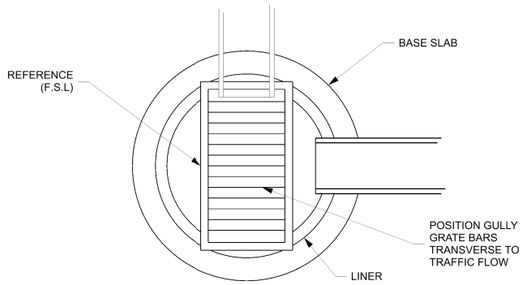

PLAN
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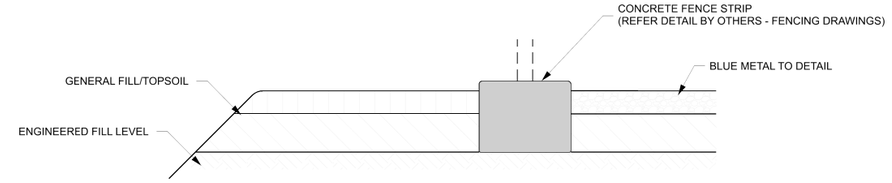
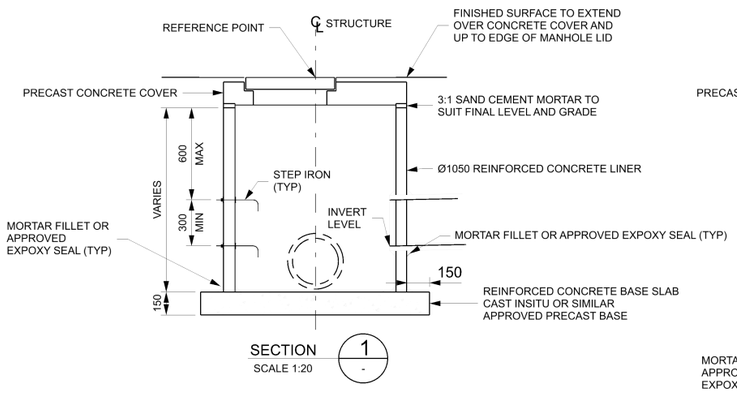
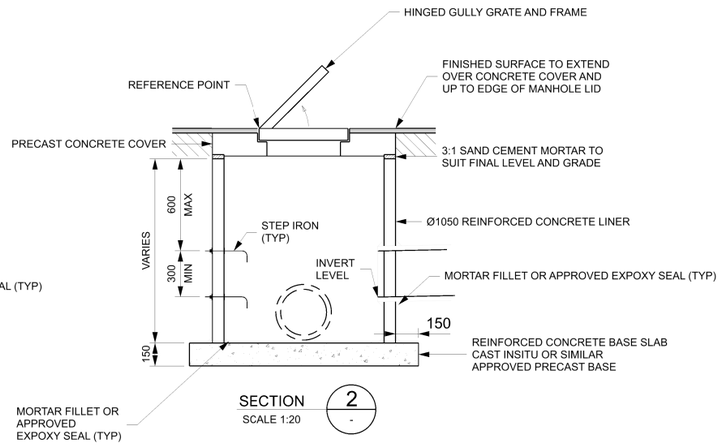


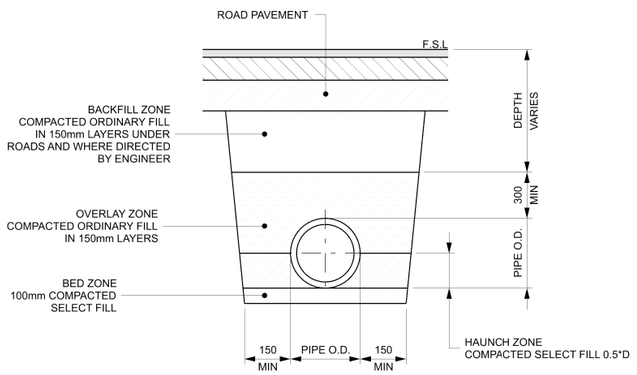
BLUE METAL TO TOP OF BATTER INTERFACE DETAIL
SCALE 1:10



JUNCTION PIT DETAIL



GRATED INLET DETAIL



PIPE TRENCH DETAIL
SCALE 1:20

SCALE 1:10mm 0 100 200 300 400 500

SCALE 1:20mm 0 200 400 600 800 1000

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED G.Every	BROLGAN 132/11kV ZONE SUBSTATION CONSTRUCTION DETAILS
DATE OF ISSUE	27/09/2024			DRAWN T.Close	
PURPOSE OF ISSUE	COMMENT			REVIEWED M.Turvey	CIVIL DRAWING
				APPROVED J.Streatfeild	

SUPERSEDES:

DRAWING NUMBER	SHT	VER
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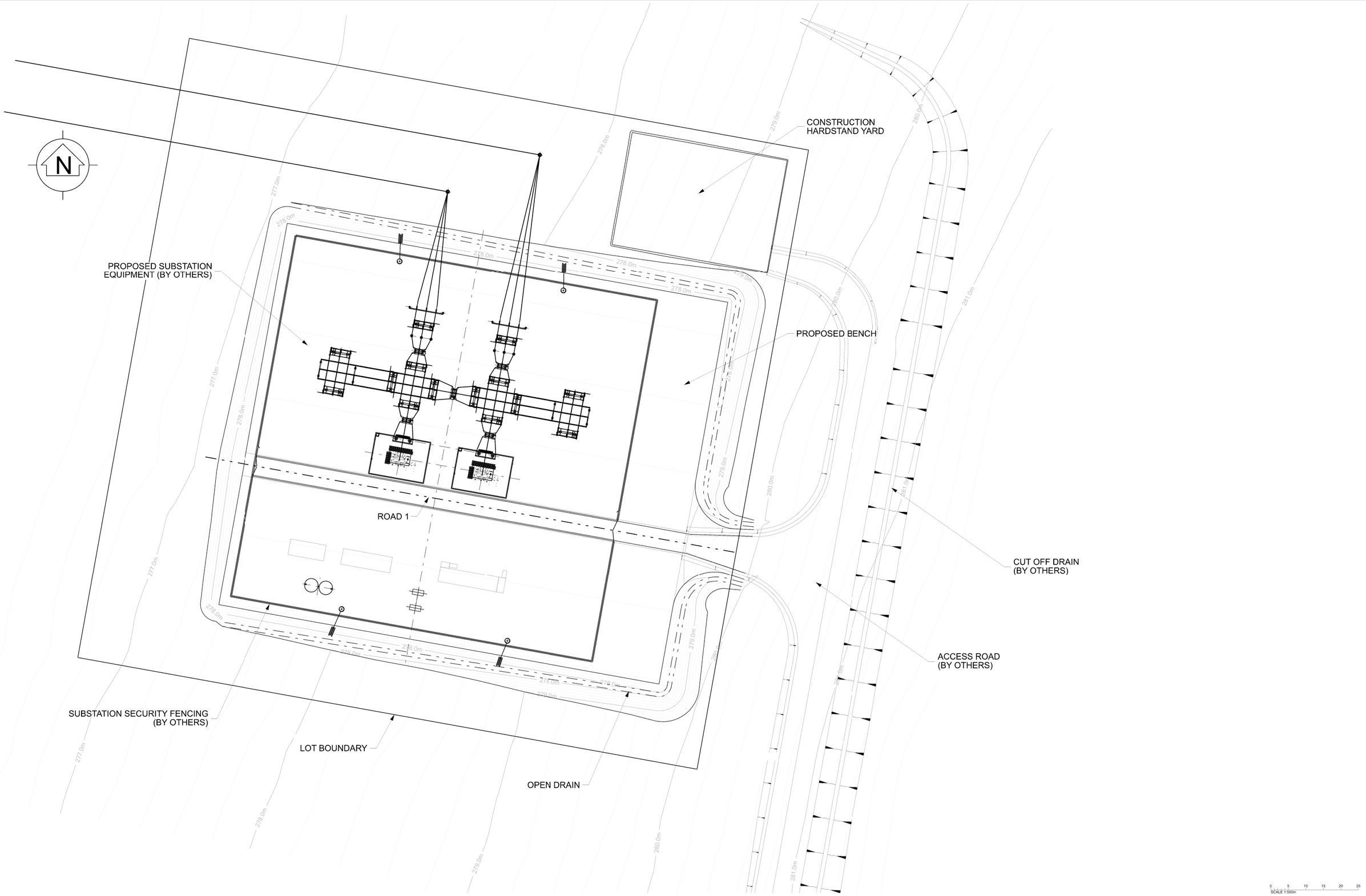

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE	PROJECT No. 805896	COMMENTS	DESIGNED G.Every	BROLGAN 132/11kV ZONE SUBSTATION GENERAL ARRANGEMENT	© 2019 Essential Energy
DATE OF ISSUE 27/09/2024			DRAWN T.Close		SUPERSEDES:
PURPOSE OF ISSUE COMMENT			REVIEWED M.Turvey	CIVIL DRAWING	DRAWING NUMBER BRN501 SHT 4/10 VER A
			APPROVED J.Streatfeild		

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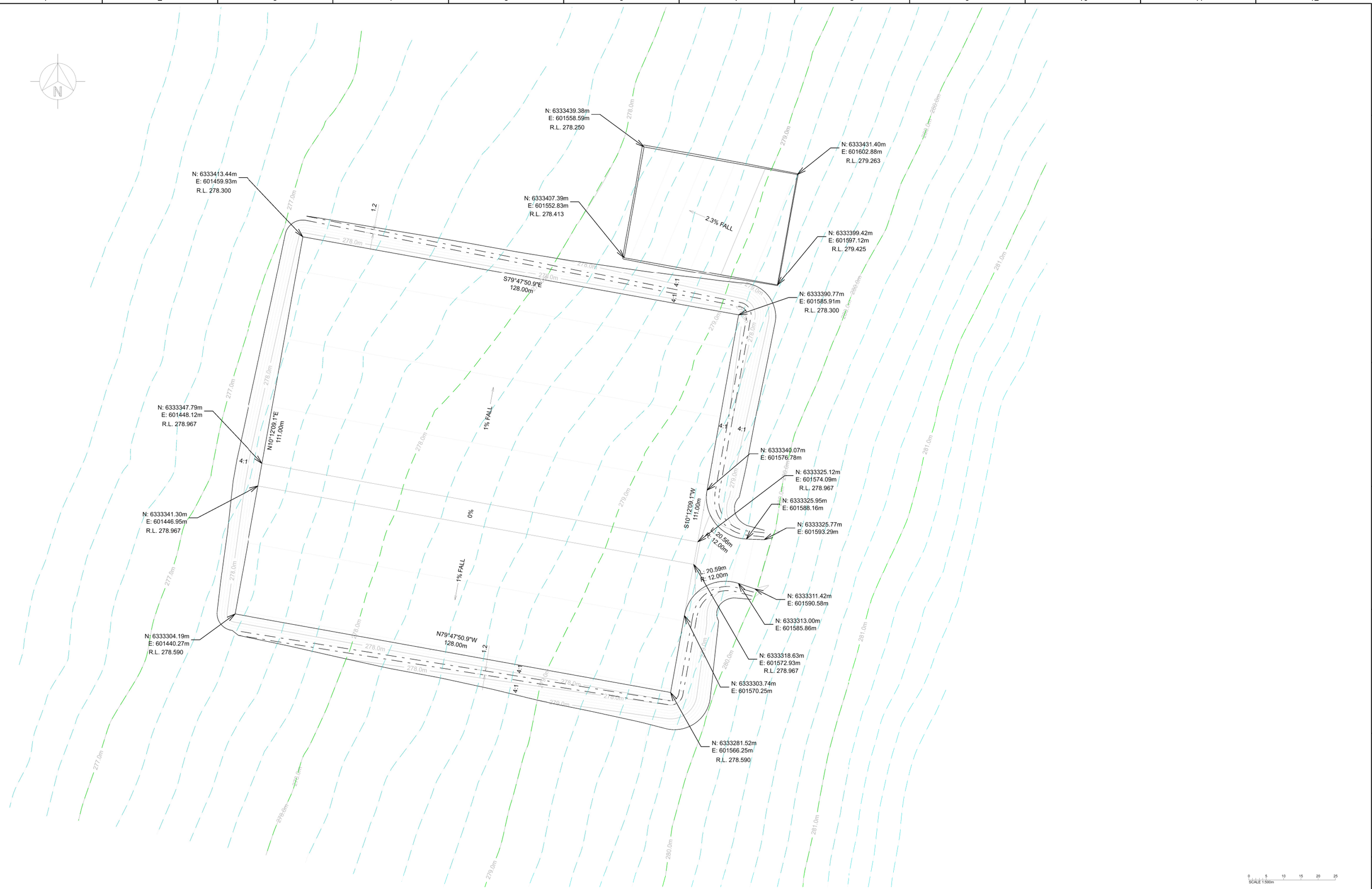

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	G.Every
DATE OF ISSUE	27/09/2024			DRAWN	G.Every
PURPOSE OF ISSUE	COMMENT			REVIEWED	M.Turvey
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BULK EARTHWORKS PLAN

CIVIL DRAWING

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRN501	5/10	A

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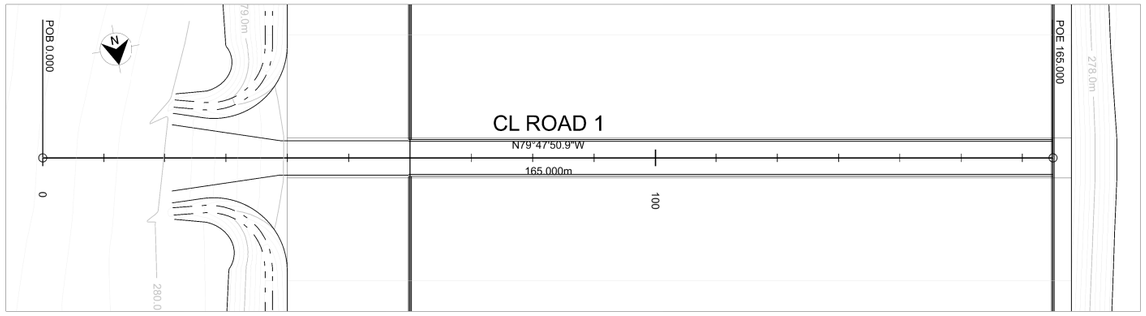

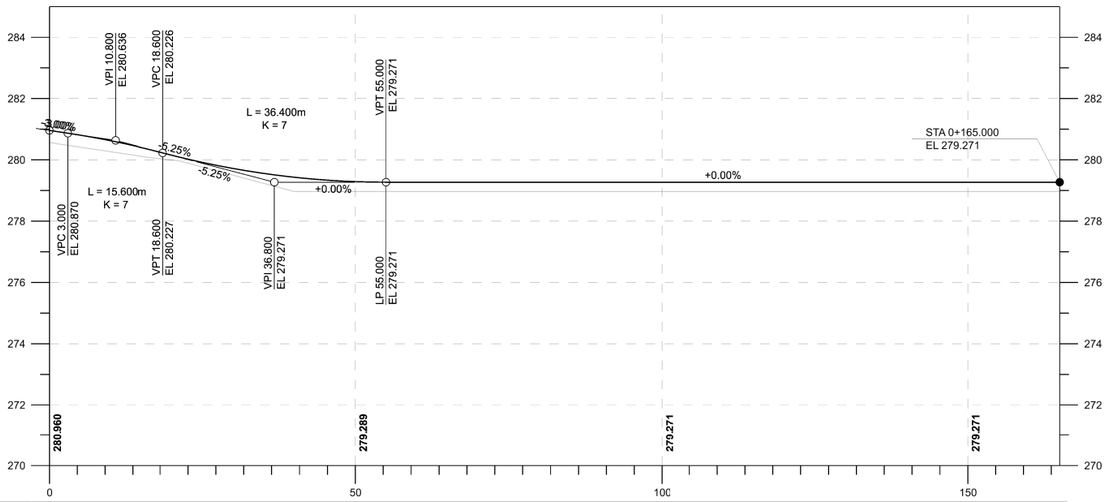

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Proposed Elevation	280.960	279.289	279.271	279.271
Existing Elevation	280.569	278.967	278.967	278.967
Delta Z	-0.391m	-0.322m	-0.304m	-0.304m
Horizontal Curve	0.000	L = 165.000m		
Vertical Curve	-3.00% 0.000 -3.000	15.600m VC K = -7	18.600 36.400m VC K = 7	55.000 0.00%

SCALE 1:500m

SCALE 1:100m

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE

DATE OF ISSUE: 27/09/2024

PURPOSE OF ISSUE: COMMENT

PROJECT No. 805896

COMMENTS

DESIGNED	G.Every
DRAWN	G.Every
REVIEWED	M.Turvey
APPROVED	J.Streatfeild

Plan-
0+000.00 - 0+165.00

BROLGAN
132/11kV ZONE SUBSTATION
PLAN & LONGSECTION - ROAD 1

CIVIL DRAWING

SUPERSEDES:

Essential Energy

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BRN501	6/10	A

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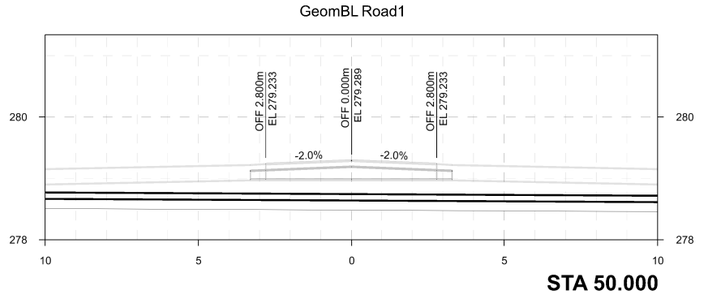

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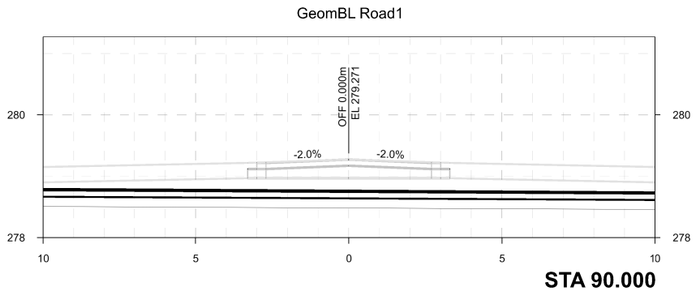

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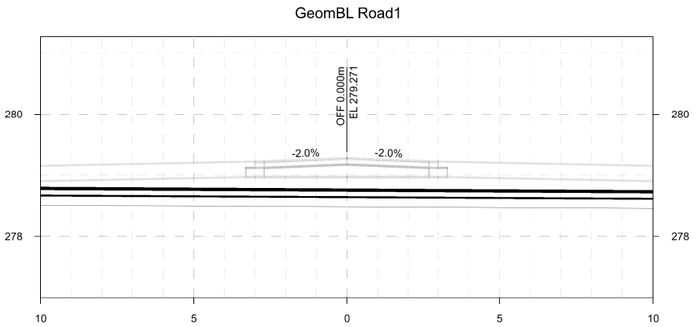

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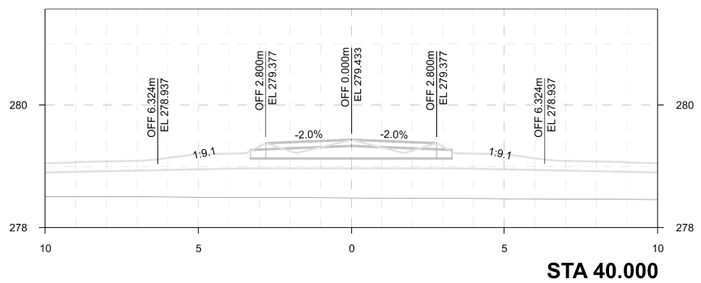

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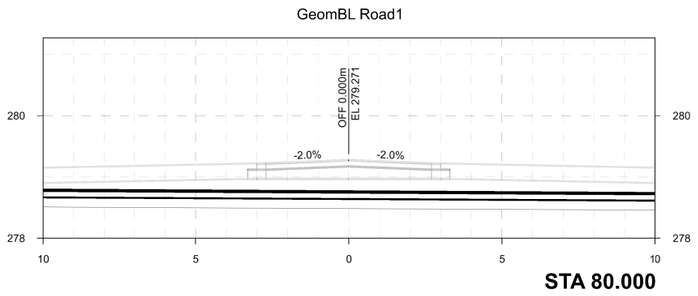

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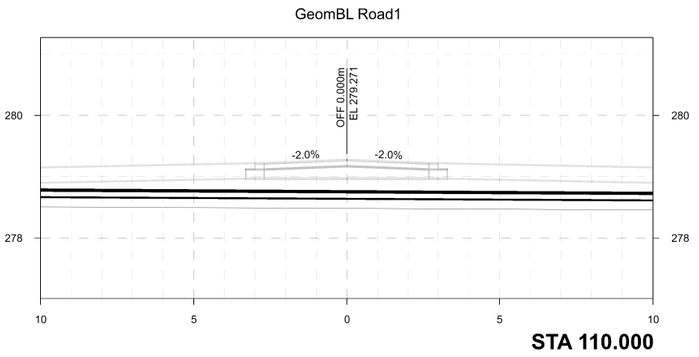

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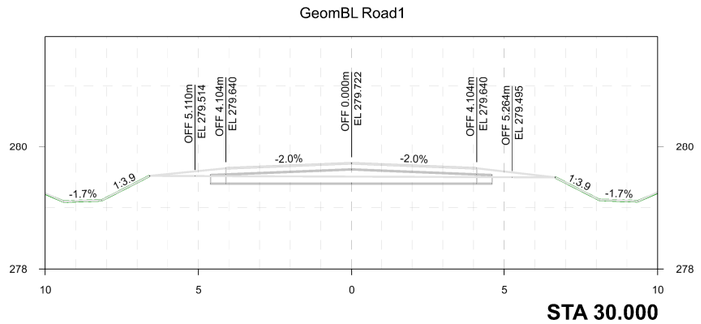

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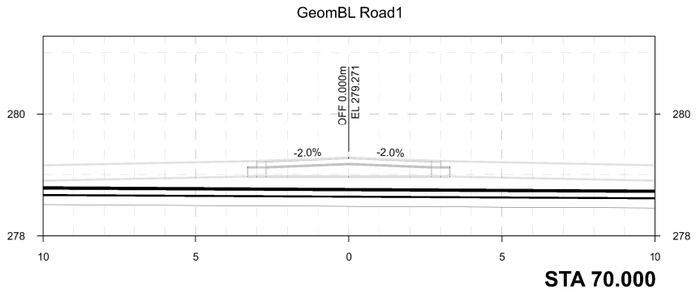

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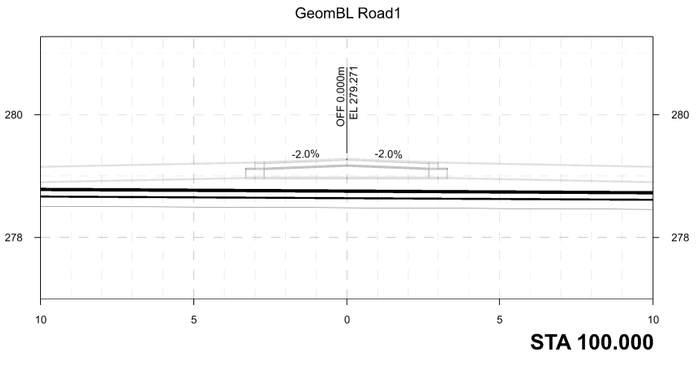

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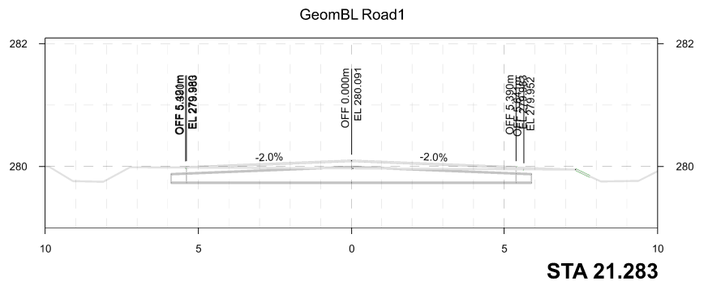

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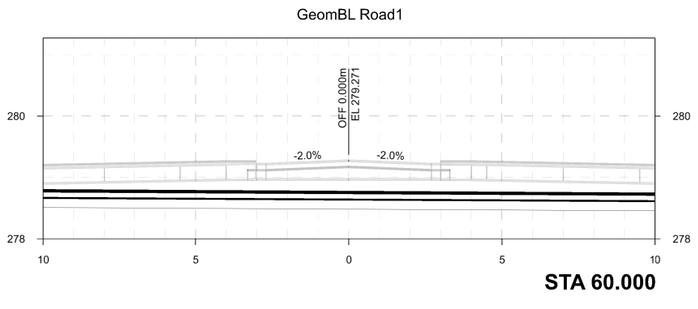

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ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	G.Every
DATE OF ISSUE	27/09/2024			DRAWN	T.Close
PURPOSE OF ISSUE	COMMENT			REVIEWED	M.Turvey
				APPROVED	J.Streatfeild

GeomBL Road1
0+021.28 - 0+120.00

BROLGAN
132/11kV ZONE SUBSTATION
CROSS SECTIONS - ROAD 1
SHEET 1
CIVIL DRAWING

SUPERSEDES:

Essential Energy

DRAWING NUMBER	SHT	VER
BRN501	7/10	A

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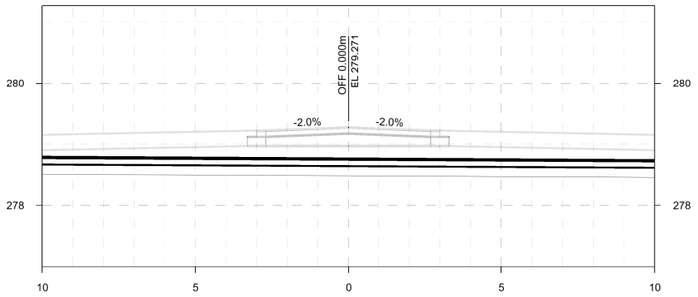
GeomBL Road1



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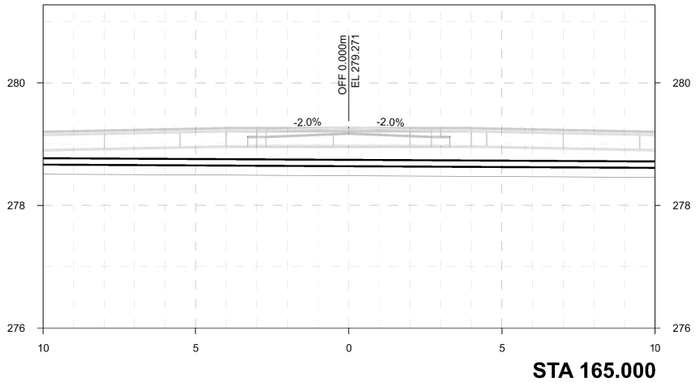
GeomBL Road1



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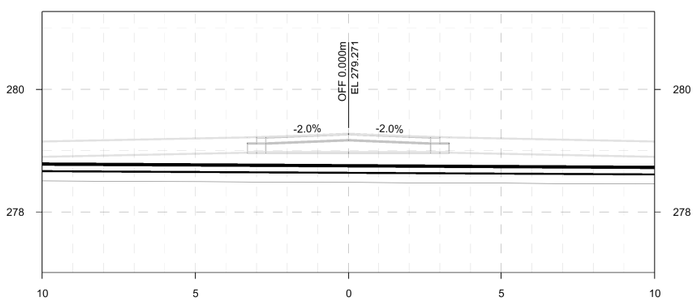
GeomBL Road1



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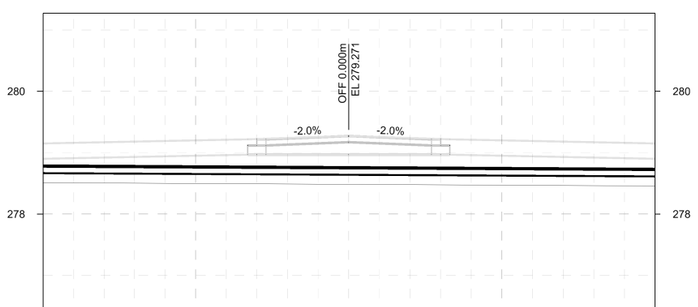

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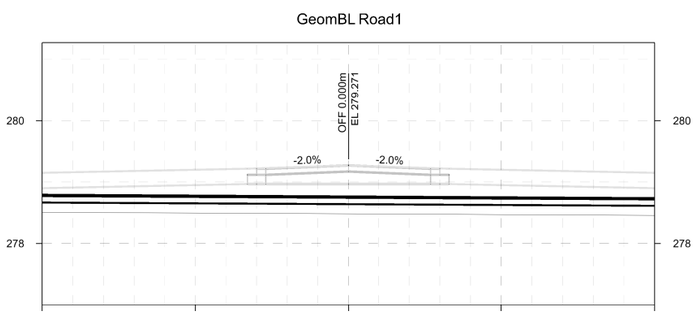

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ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE	PROJECT No. 805896	COMMENTS	DESIGNED	G.Every	**GeomBL Road1** **0+130.00 - 0+165.00**
DATE OF ISSUE 27/09/2024			DRAWN	G.Every	
PURPOSE OF ISSUE COMMENT			REVIEWED	M.Turvey	
			APPROVED	J.Streatfeild	

BROLGAN
132/11kV ZONE SUBSTATION
CROSS SECTIONS - ROAD 1
SHEET 2
CIVIL DRAWING

SUPERSEDES:

Essential Energy

DRAWING NUMBER	SHT	VER
BRN501	8/10	A

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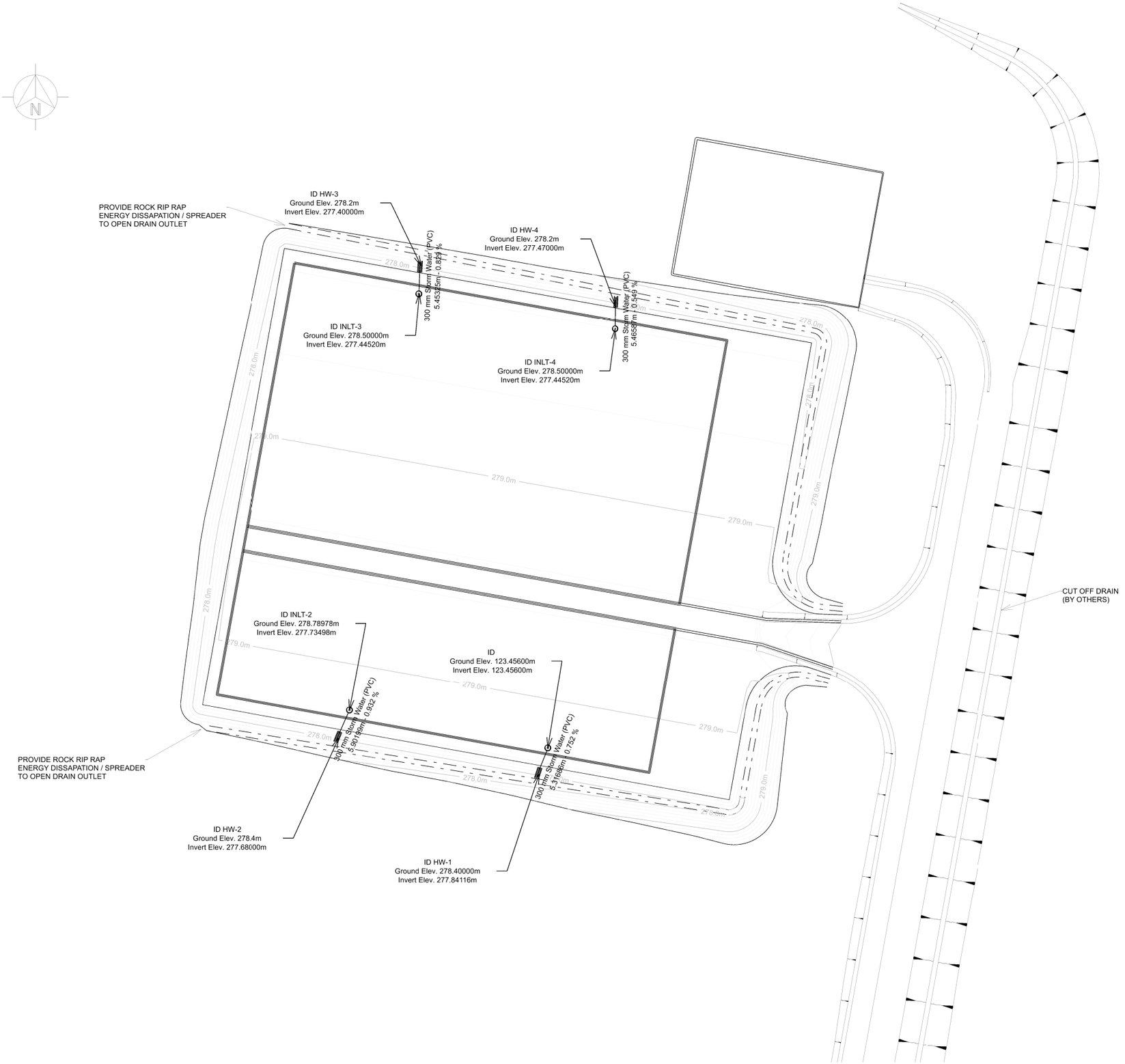

PIT SCHEDULE

Pit ID	Pit Type	Pit Size
INLT-1	RAISED GRATE	600 x 600
INLT-2	RAISED GRATE	600 x 600
INLT-3	RAISED GRATE	600 x 600
INLT-4	RAISED GRATE	600 x 600
HW-1	HEADWALL	300mm
HW-2	HEADWALL	300mm
HW-3	HEADWALL	300mm
HW-4	HEADWALL	300mm

0 5 10 15 20 25
SCALE 1:500m

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE

DATE OF ISSUE	27/09/2024
PURPOSE OF ISSUE	COMMENT

PROJECT No. 805896 | COMMENTS

DESIGNED	G.Every
DRAWN	G.Every
REVIEWED	M.Turvey
APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
DRAINAGE PLAN

CIVIL DRAWING

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRN501	9/10	A

Printed By: ESSENPW111CS01$
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SEDIMENT FENCE

STRAW BALE FILTER

POTENTIAL TEMPORARY STOCKPILE SITE (TBD BY CONTRACTOR AND TREATED AS PER DIAGRAM)

PROPOSED SUBSTATION CONSTRUCTION YARD BENCH

PROPOSED SUBSTATION BENCH

SEDIMENT FENCE

STABILISED SITE ACCESS NEAR ENTRY POINT ON BROLGAN ROAD

277.0m 278.0m 279.0m 280.0m 281.0m

NOTES

REFER TO DRAWING BRN501-002 FOR CONSTRUCTION NOTES

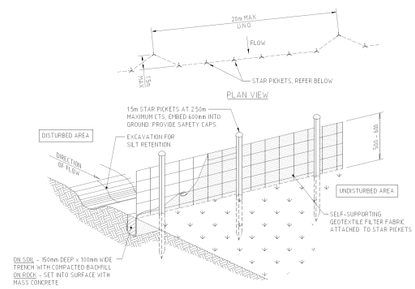
THE ARRANGEMENT OF SEDIMENT AND EROSION CONTROL MEASURES SHOWN ARE INDICATIVE ONLY AND RELATE TO A PARTICULAR STAGE OF THE CONSTRUCTION WORKS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DESIGN, CONSTRUCT AND MAINTAIN WHATEVER ADDITIONAL MEASURES THAT MAY BE REQUIRED FOR THE CONTRACTORS CONSTRUCTION METHODOLOGIES, IN ORDER TO MEET ALL CONDITIONS AND REQUIREMENTS IMPOSED BY ANY STATUTORY AUTHORITY

SEDIMENT AND EROSION CONTROL IS TO BE DESIGNED, CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE 'BLUE BOOK' (THE DEPARTMENT OF HOUSING PUBLICATION, "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTION") AND IS THE RESPONSIBILITY OF THE CONTRACTOR

NO EXISTING SERVICES HAVE BEEN INDICATED OR LOCATED HOWEVER MAY NOT BE NECESSARILY COMPREHENSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATIONS OF ANY EXISTING SERVICES AND INFORM ALL RELEVANT AUTHORITIES PRIOR TO ANY EXCAVATION

ALL EXPOSED/DISTURBED AREAS TO BE TREATED IN ACCORDANCE WITH ESSENTIAL ENERGY LANDSCAPING REQUIREMENTS

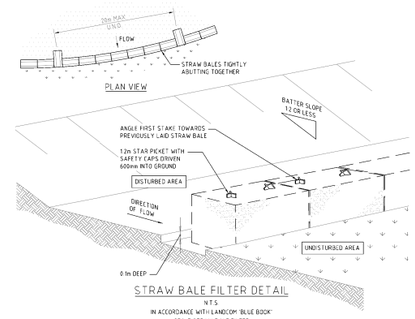
EXISTING CONTOURS ARE SHOWN AT 0.25m INTERVALS



SEDIMENT CONTROL FENCE DETAIL

N.T.S.

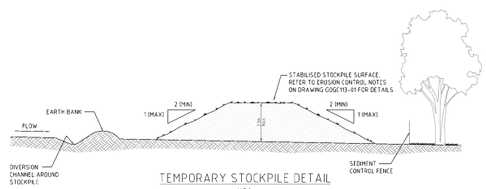
IN ACCORDANCE WITH LANDCOM 'BLUE BOOK' SD6-8 SEDIMENT FENCE



STRAW BALE FILTER DETAIL

N.T.S.

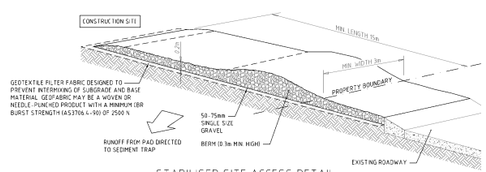
IN ACCORDANCE WITH LANDCOM 'BLUE BOOK' SD6-7 STRAW BALE FILTER



TEMPORARY STOCKPILE DETAIL

N.T.S.

IN ACCORDANCE WITH LANDCOM 'BLUE BOOK' SD4-1 STOCKPILES



STABILISED SITE ACCESS DETAIL

N.T.S.

IN ACCORDANCE WITH LANDCOM 'BLUE BOOK' SD6-14 STABILISED SITE ACCESS

ALL DIMENSIONS ARE IN METERS (m) U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	G.Every
DATE OF ISSUE	27/09/2024			DRAWN	G.Every
PURPOSE OF ISSUE	COMMENT			REVIEWED	M.Turvey
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
SEDIMENT & EROSION CONTROL PLAN

CIVIL DRAWING

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRN501	10/10	A

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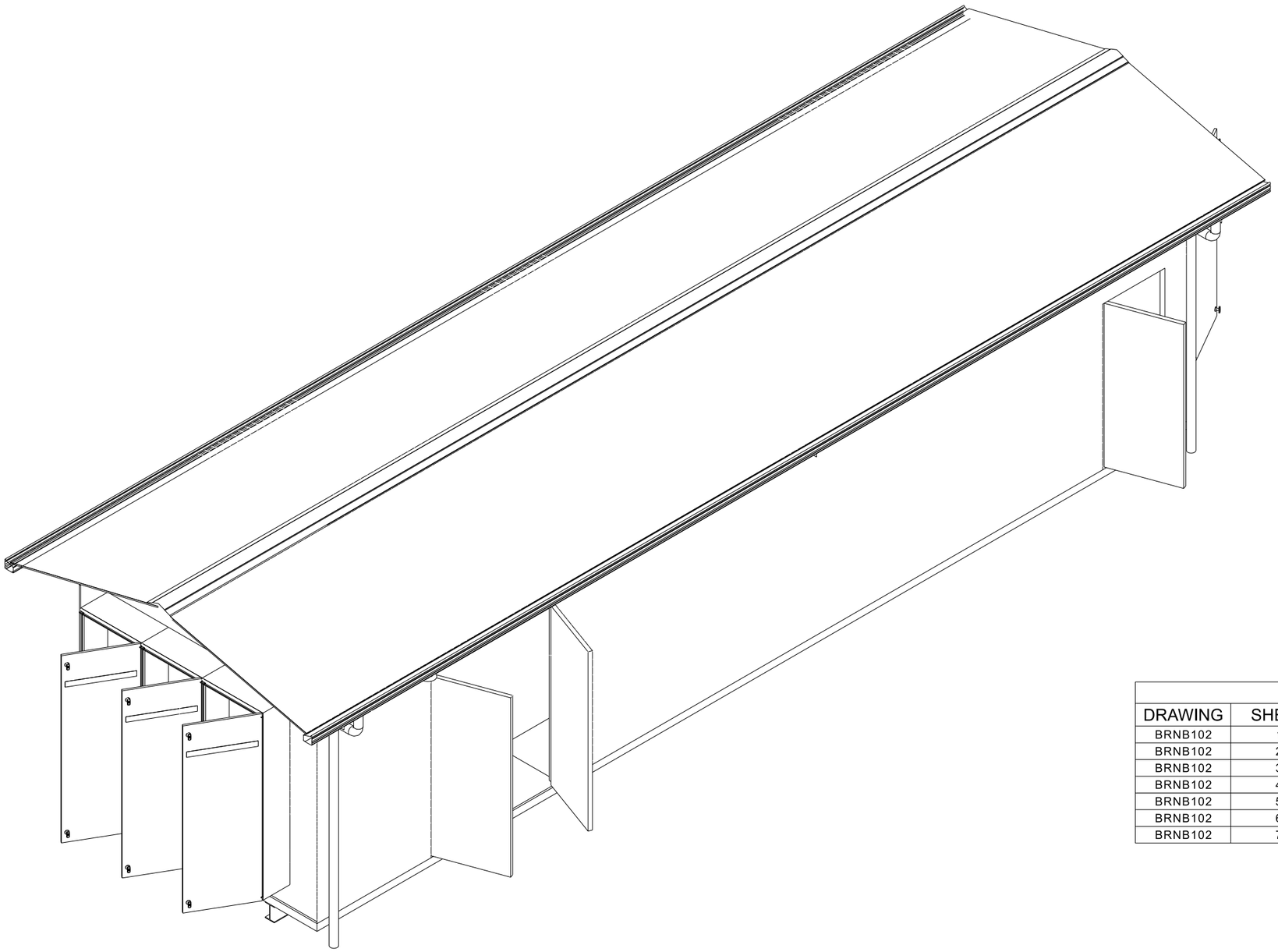
CAD File: BRN501-010.dgn

BROLGAN SUBSTATION CONTROL ROOM BUILDING



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DRAWING	SHEET	DRAWING TITLE
BRNB102	1	CONTROL ROOM BUILDING COVER ARRANGEMENT
BRNB102	2	CONTROL ROOM BUILDING PLAN VIEW
BRNB102	3	CONTROL ROOM BUILDING ELEVATION
BRNB102	4	CONTROL ROOM BUILDING ELECTRICAL LAYOUT DETAIL
BRNB102	5	CONTROL ROOM FLOOR LOADINGS DETAIL
BRNB102	6	CONTROL ROOM WALL PENETRATIONS DETAIL
BRNB102	7	CONTROL ROOM CABLE TRAY ROOF LOADING DETAIL

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE

DATE OF ISSUE	24/06/2024
PURPOSE OF ISSUE	INFORMATION

PROJECT No. 805896

COMMENTS: NOT FOR CONSTRUCTION FOR TENDER ONLY

DESIGNED	M.Maley
DRAWN	A.Boserio
REVIEWED	C.Wing
APPROVED	J.Streatfeild

REFERENCE FILES

BRNC101-1 - TRANSPORTABLE BUILDINGS FOOTING DETAIL PLAN VIEW

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING
COVER PAGE
ARRANGEMENT

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB102	1/1	A

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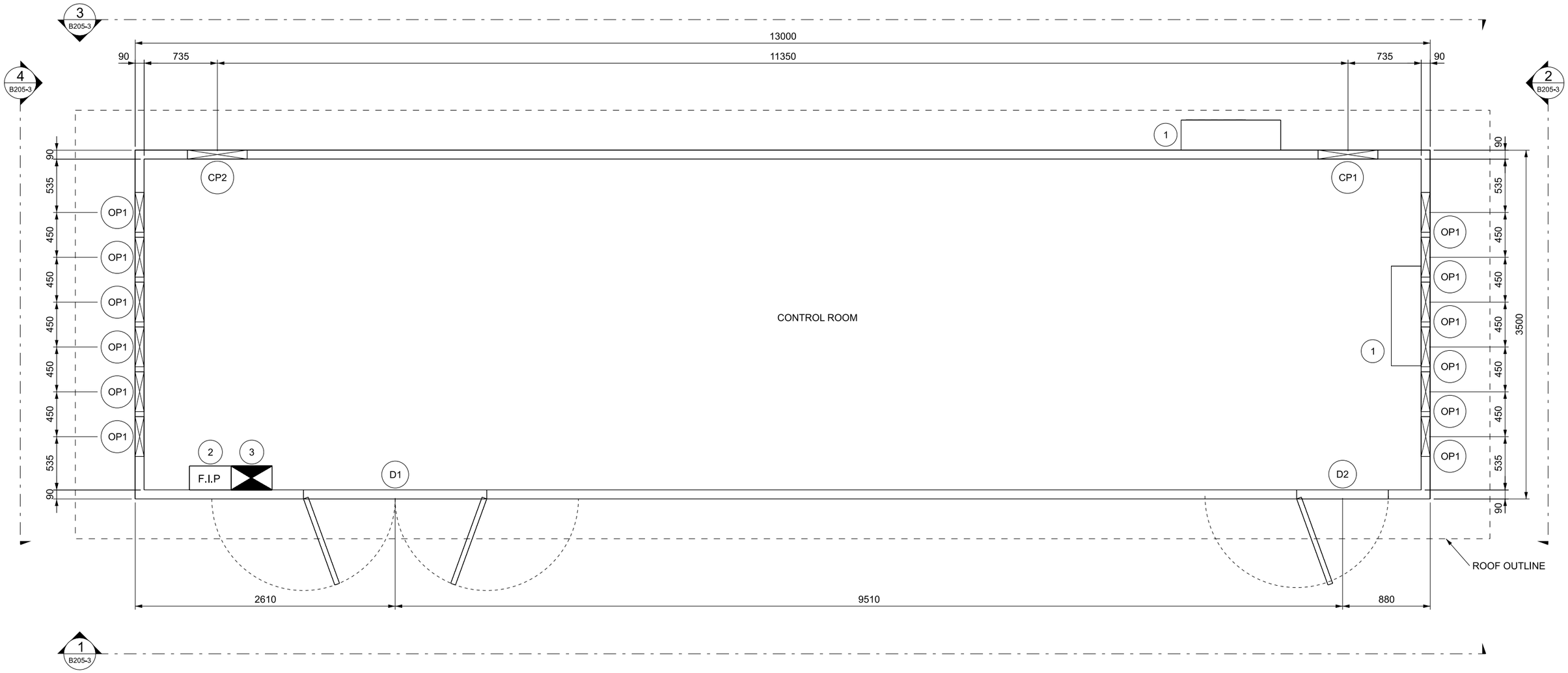

LEGEND:

WALL PENETRATIONS
REFER TO BRNB102 SHEET 6 FOR DETAIL

NOTE:

1. AIR CONDITIONER CONDENSERS SHALL BE INSTALLED ON OUTER WALL, MIN 200mm OFF TOP OF CONCRETE FOOTING.
2. DOWNPIPES (DP) SHALL BE PVC AND PAINTED TO MATCH COLORBOND - WOODLAND GREY.
3. CLOSED WALL PENETRATIONS TO BE COVERED OVER WITH WALL SHEETING.

ITEM	DESCRIPTION	REMARKS	QTY
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
3	FIRE PROTECTION PANEL	-	1
2	400/230V AC DISTRIBUTION PANEL	-	1
1	SPLIT SYSTEM AIR CONDITIONING	-	1
OP1	OPEN WALL PENETRATIONS - 400mm x 150mm	DRAWING BRNB102-6	12
CP1	CLOSED WALL PENETRATIONS - 600mm x 250mm	DRAWING BRNB102-6	2
D2	SINGLE DOOR OPENING - 1 x 920mm DOOR LEAF	-	1
D1	DOUBLE DOOR OPENING - 2 x 920mm DOOR LEAF	-	1

CONTROL ROOM EQUIPMENT

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE

DATE OF ISSUE	24/06/2024
PURPOSE OF ISSUE	INFORMATION

PROJECT No. 805896

COMMENTS: NOT FOR CONSTRUCTION FOR TENDER ONLY

DESIGNED	M.Maley
DRAWN	A.Boserio
REVIEWED	C.Wing
APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING

PLAN VIEW

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB102	2/7	A

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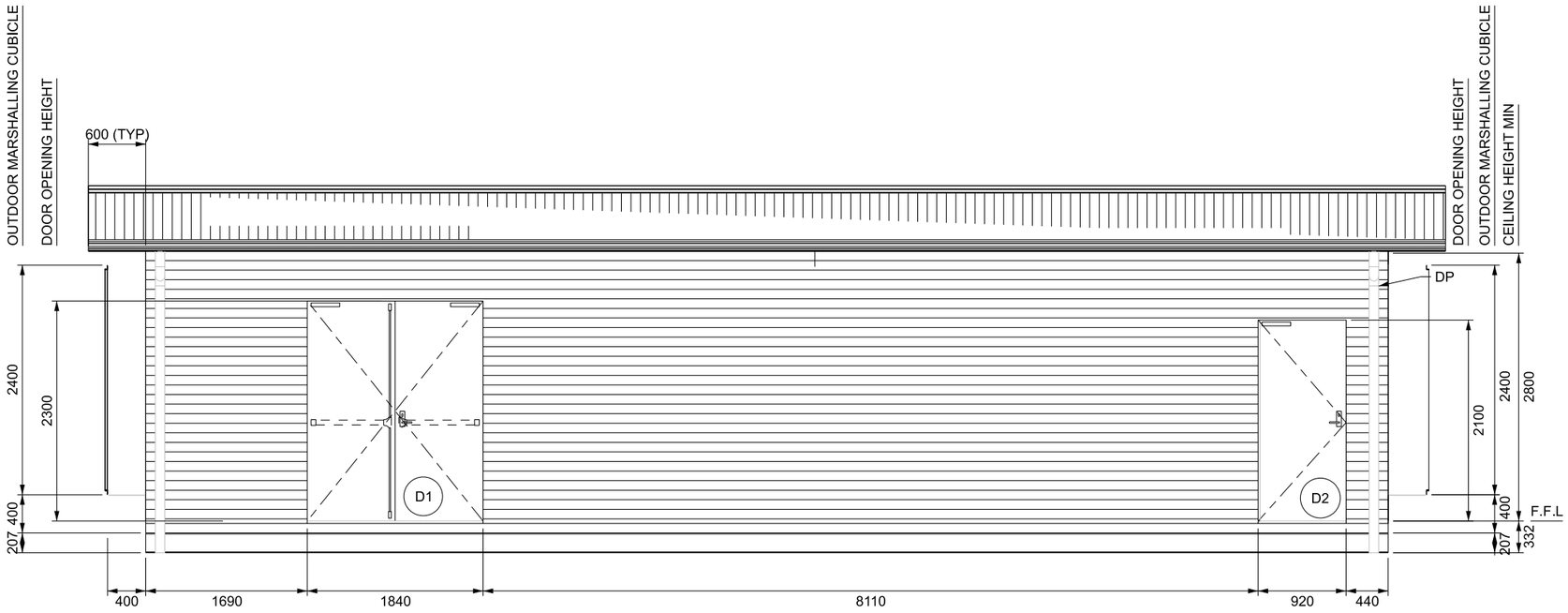
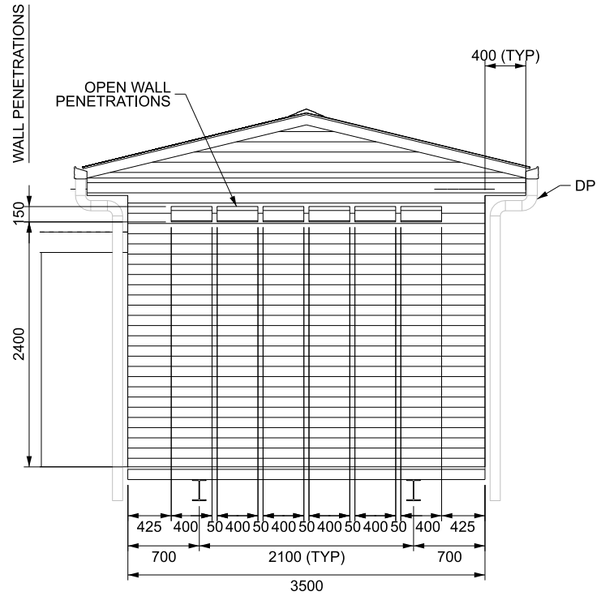
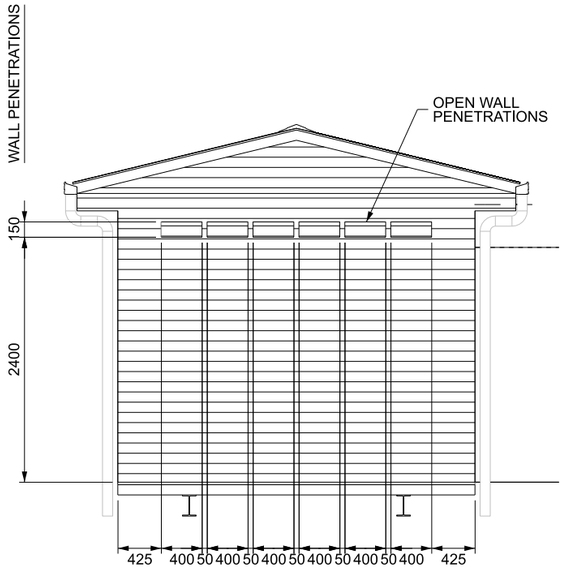


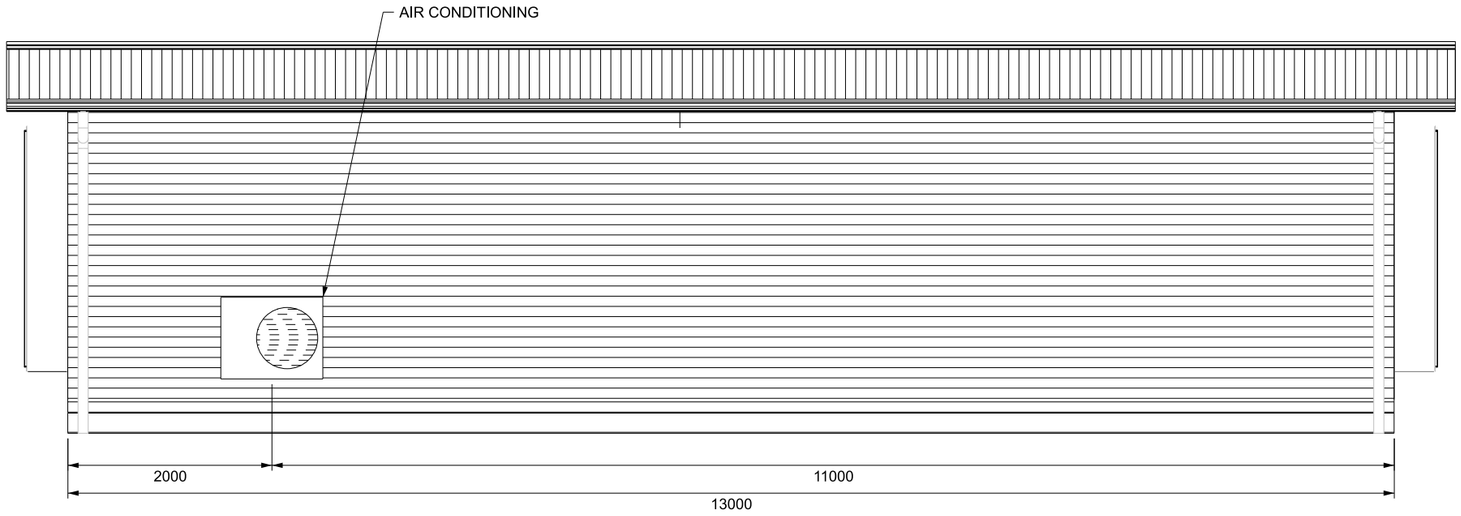
ELEVATION 1
FRONT VIEW



ELEVATION 2
RIGHT VIEW



ELEVATION 3
LEFT VIEW



ELEVATION 4
BACK VIEW

NOTE:

1. DOWNPIPES (DP) SHALL BE PVC AND PAINTED TO MATCH COLORBOND - WOODLAND GREY.
2. OUTDOOR MARAHALLING CUBICLE DOORS OMITTED FOR CLARITY.

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING

ELEVATION

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB102	3/7	A

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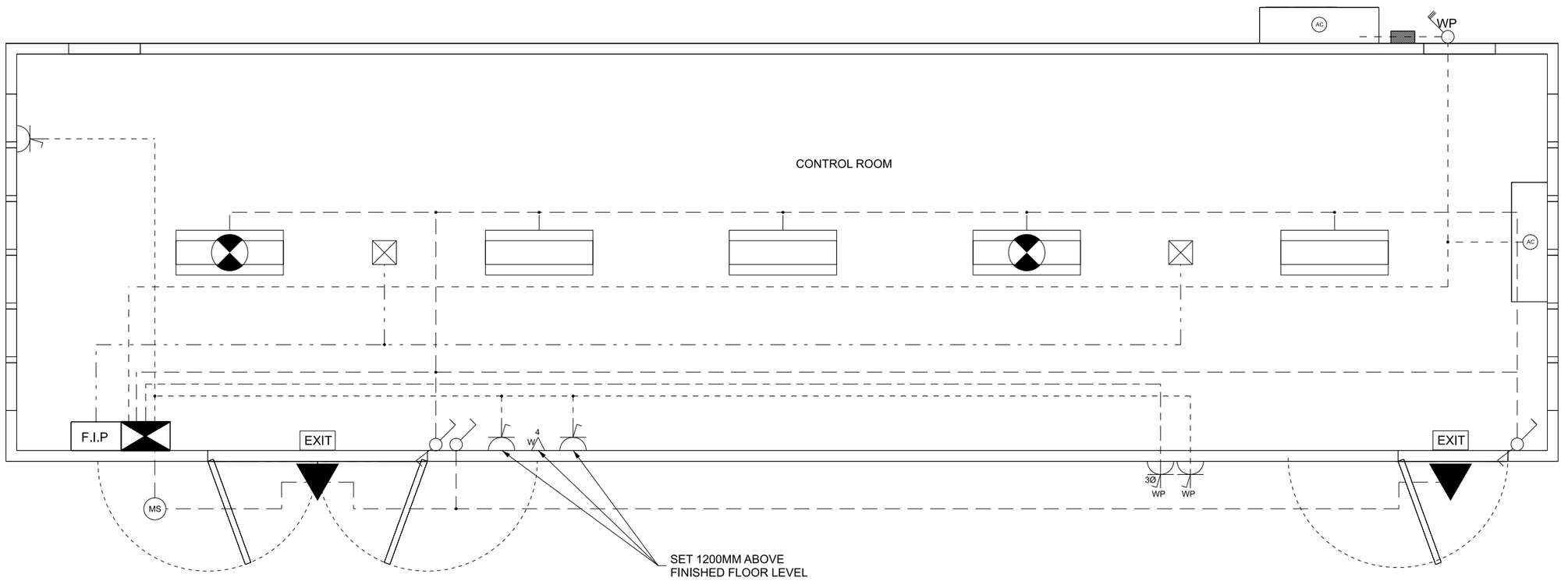

AC DISTRIBUTION PANEL

F.I.P FIRE PANEL

56 SERIES JUNCTION BOX

WP 3Ø 3 PHASE, 16A, 400V IP56 OUTDOOR SPECIAL PURPOSE OUTLET

1 PHASE, 10A, 2 WAY LIGHT SWITCH

1 PHASE, 10A, 1 WAY LIGHT SWITCH

SMOKE DETECTOR

THERMAL DETECTOR

AC AIR CONDITIONING UNIT

2x18W LED TYPE FITTING C/W DIFFUSERS WITH 1 MAINTAINED TUBE ON BATTERY PACK

SINGLE 18W EXTERNAL LED TYPE VANDAL PROOF LIGHT FITTINGS

2x18W LED TYPE FITTINGS C/W DIFFUSER

EXIT 2X3W MAINTAINED LED EXIT LIGHT FITTING

4W 4 GANG RJ45 WALL MOUNT OUTLET

MS MOTION SENSOR

WP 1 PHASE, 10A, 230V OUTDOOR ISOLATION SWITCH

WP 1 PHASE, 10A, 230V DUPLEX IP56 OUTDOOR GENERAL PURPOSE OUTLET

1 PHASE, 10A, 230V DUPLEX GENERAL PURPOSE OUTLET

3Ø 3 PHASE, 16A, 400V SPECIAL PURPOSE OUTLET

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley	BROLGAN 132/11kV ZONE SUBSTATION CONTROL ROOM BUILDING ELECTRICAL LAYOUTS DETAIL	
DATE OF ISSUE	24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio		SUPERSEDES:
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing		DRAWING NUMBER: BRNB102 SHT: 4/7 VER: A
				APPROVED	J.Streatfeild		

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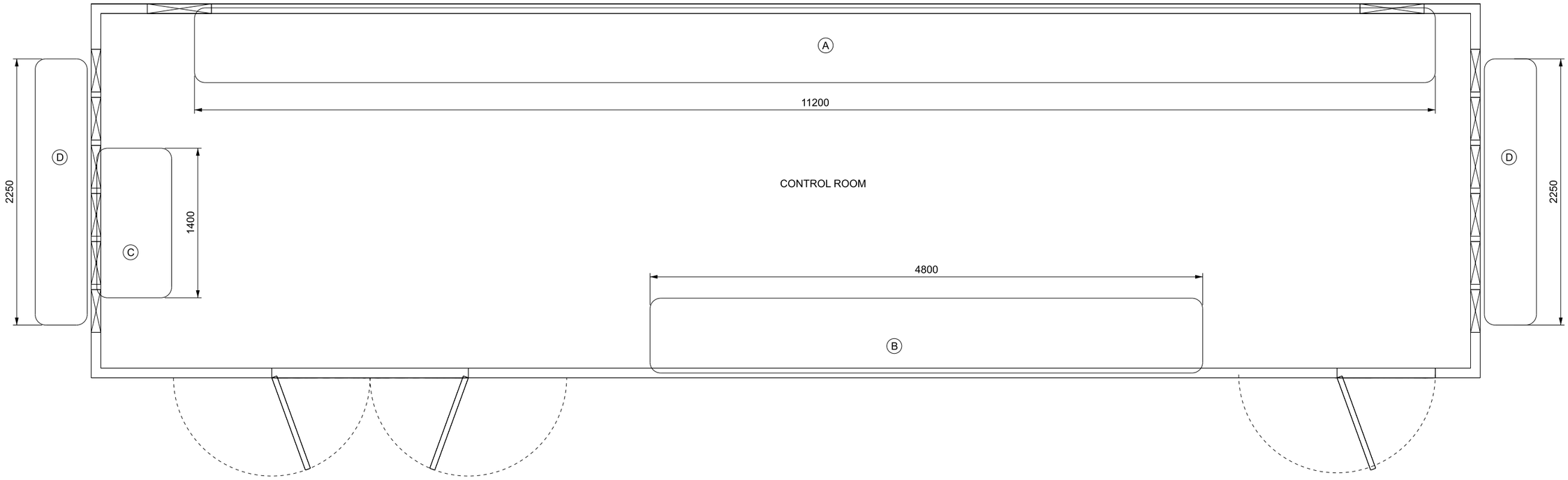

PLAN VIEW

LEGEND:

WALL PENETRATIONS
REFER TO BRNB102 SHEET 2 FOR LOCATIONS

ITEM	DESCRIPTION	APPROX. WEIGHT	TOTAL WEIGHT
D	OUTDOOR MARSHALLING CUBICLES (FIXED TO WALL FRAME)	100kg	500kg
C	BATTERY CHARGERS	135kg	270kg
B	PROTECTION AND CONTROL PANELS	200kg	1200kg
A	PROTECTION AND CONTROL PANELS	200kg	2800kg

CONTROL ROOM EQUIPMENT

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING
FLOOR & WALL LOADINGS
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB102	5/7	A

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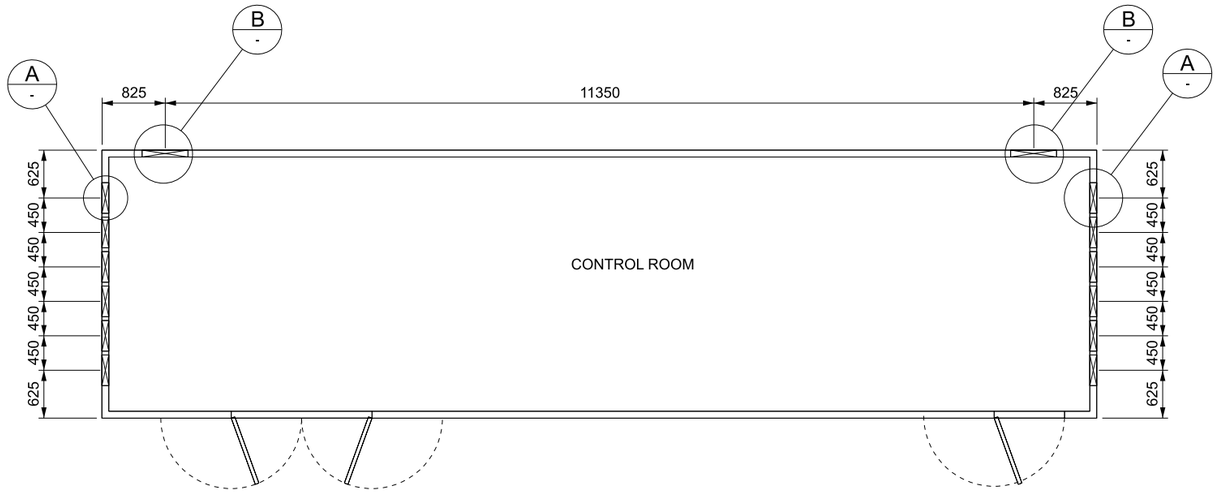
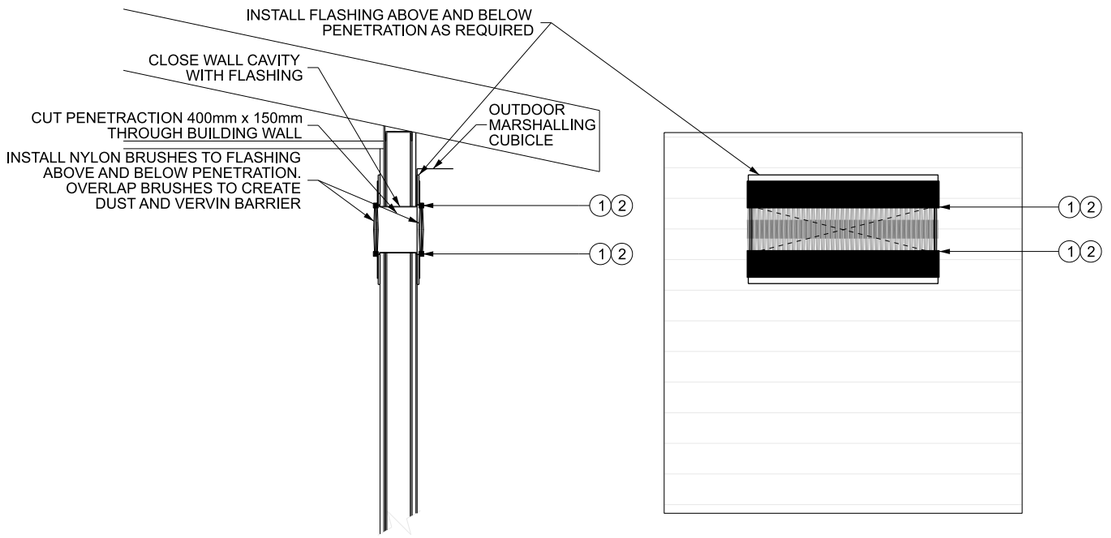
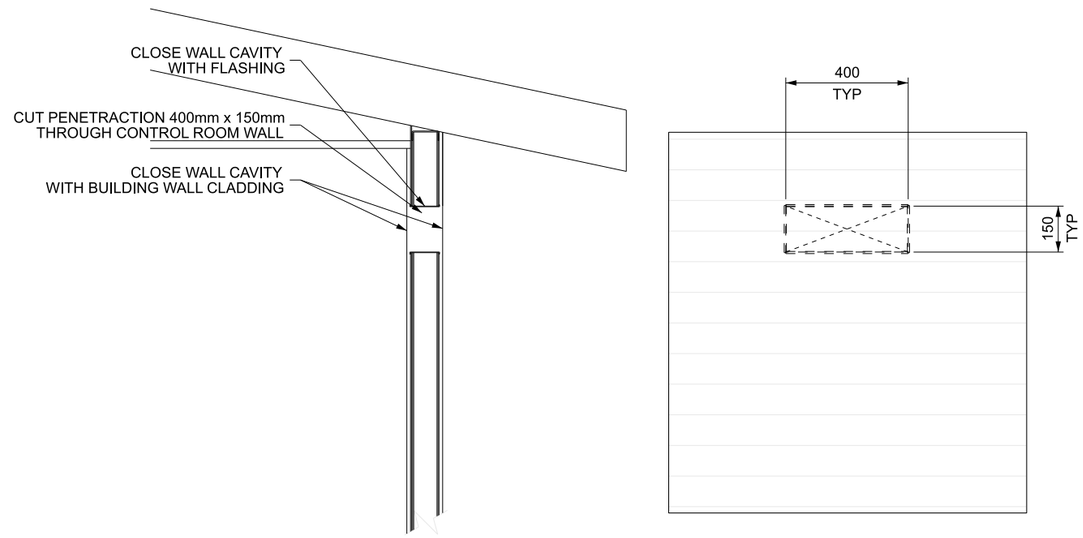


PLAN VIEW



DETAIL A
USED CABLE PENETRATION WITH VERMIN BRUSHING



DETAIL B
UNUSED CABLE PENETRATION WITH WALL CLADDING OVER

NOTES:

1. STRIP VERMIN AND DUST BRUSHES SHALL BE BUSYBEE INDUSTRIAL GRADE FLAME RETARDANT BRUSHES OR EQUIVALENT.
   https://www.busybee.com.au/product-category/strip-brush-garage-door-seals/sample-pack-try-before-you-buy/
2. CABLE PENETRATIONS TO BE FILLED WITH FIRE PILLOWS.
   https://www.passivefirewarehouse.com.au/promat-promaseal-fire-pillows-small~3530

ITEM	DESCRIPTION	REMARKS	QTY
9	-	-	-
8	-	-	-
7	-	-	-
6	-	-	-
5	-	-	-
4	-	-	-
3	-	-	-
2	STRIP BRUSHING 9mm 'h' PROFILE HOLDERS	ALUMINIUM	48
1	STRIP BRUSHING 100mm BRUSHES WITH 9mm BACKING 0.15" FLAME RETARDANT POLYPROPOLENE 9mm 'h' PROFILE HOLDERS	0.15" FLAME RETARDANT POLYPROPYLENE BRUSHES INDUSTRIAL GRADE	48

CONTROL ROOM EQUIPMENT

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE

DATE OF ISSUE: 24/06/2024

PURPOSE OF ISSUE: INFORMATION

PROJECT No. 805896

COMMENTS: NOT FOR CONSTRUCTION FOR TENDER ONLY

DESIGNED	M.Maley
DRAWN	A.Boserio
REVIEWED	C.Wing
APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING
WALL PENETRATIONS
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB102	6/7	A

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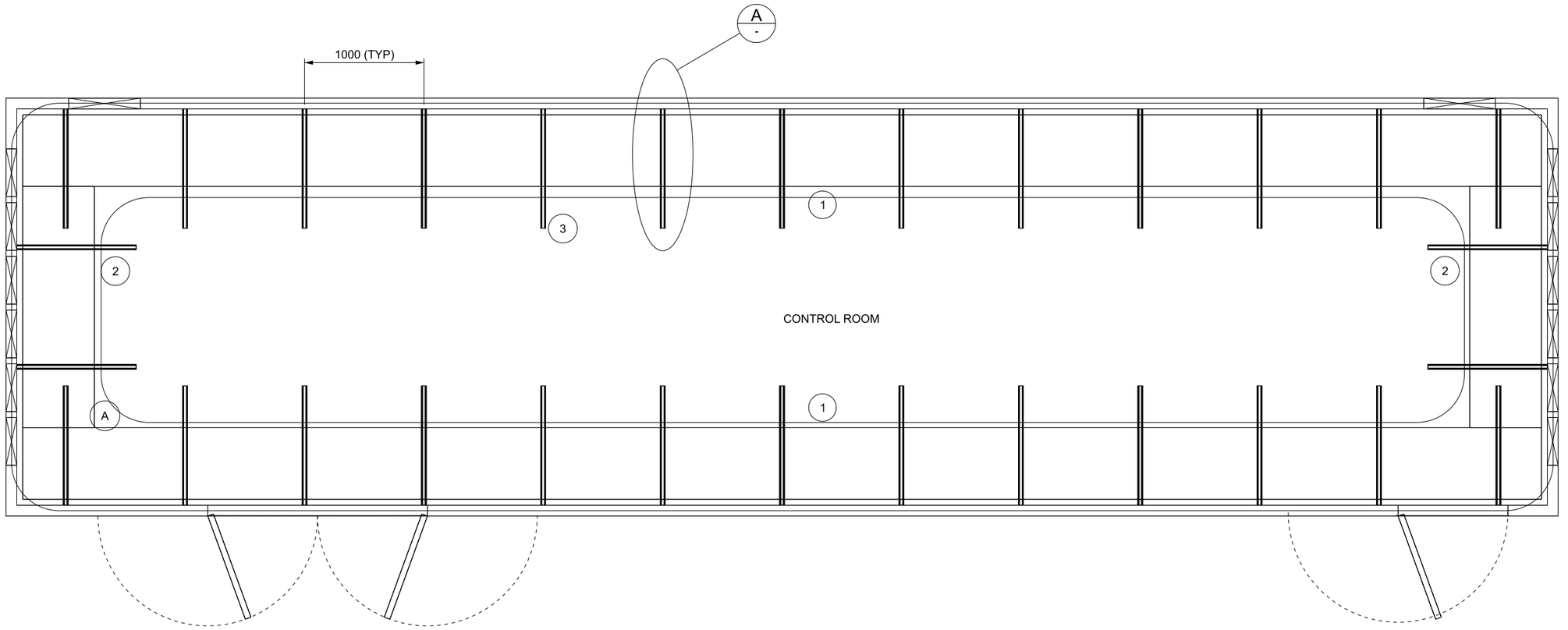

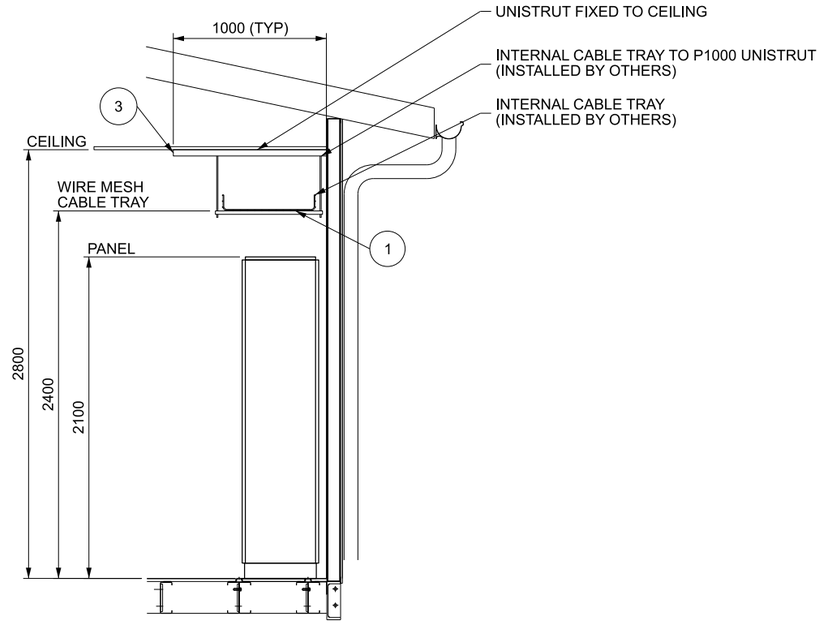

DETAIL A
CABLE TRAY & PANEL MOUNT DETAIL

NOTES:

1. CABLE TRAY INSTALLED IN CONTROL ROOM TO BE EARTHED AT PROTECTION & CONTROL PANEL EARTH BARS.
2. P1000 UNISTRUT TO BE FIXED TO ROOF TRUSS.

LEGEND:

WALL PENETRATIONS
REFER TO BRNB102 SHEET 2 FOR LOCATIONS

CABLE TRAY

ITEM	DESCRIPTION	APPROX. WEIGHT	TOTAL WEIGHT
A	CABLE TRAY & PROTECTION & CONTROL CABLING	25kg/m	735kg
B	-	-	-
C	-	-	-
D	-	-	-

EQUIPMENT LOADING

ITEM	DESCRIPTION	PART NO.	QTY	REMARKS
1	600W ACROFIL TRIPPLE ROD REINFORCED TRAY (100mm DEPTH)	AF100-600	12.8m	INSTALLED BY OTHERS
2	600W ACROFIL TRIPPLE ROD REINFORCED TRAY (100mm DEPTH)	AF100-600	1.9m	INSTALLED BY OTHERS
3	P1000 UNISTRUT - 1m LENGTHS	P1000-HG	AS REQ	-
4	-	-	-	-
5	-	-	-	-
6	-	-	-	-
7	-	-	-	-

CABLE TRAY

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE	PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE: 24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE: INFORMATION			REVIEWED	C.Wing
			APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING
ROOF LOADINGS
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB102	7/7	A

Printed By: ESSENPW11HCS01$
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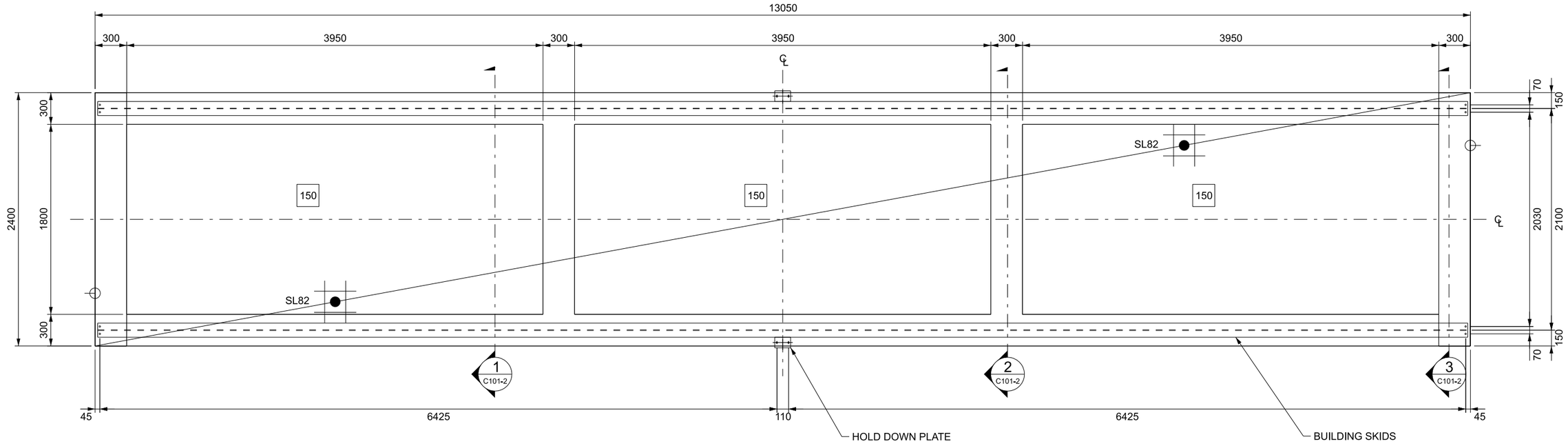

APPROXIMATE CONCRETE VOLUME = 9.0m³
APPROXIMATE REINFORCEMENT WEIGHT = 320kg

LEGEND

⏚ DULMISON C70 EARTH BOND CONNECTED TO CONCRETE STEEL REINFORCING

BUILDING INSTALLATION NOTES

1. BUILDING HOLD DOWN BOLTS SHALL BE M12 x 70mm GALVANISED DYNABOLT OR EQUIVALENT, IN ACCORDANCE WITH CONTRACTOR'S STRUCTURAL ENGINEERS INSTRUCTIONS.
2. HOLD DOWN BOLTS SHALL BE DRILLED AND INSTALLED AT THE TIME OF THE BUILDING INSTALLATION.
3. HOLD DOWN BOLT LOCATIONS SHOWN ON DRAWING ARE INDICATIVE AND SHALL BE CONFIRMED BY CONTRACTOR BEFORE INSTALLATION.
4. CONTRACTOR SHALL ACCURATELY MEASURE ALL INSTALLED HOLD DOWN BOLTS AND MARK-UP DRAWING.

SITE PREPARATION DETAILS

1. REMOVE ALL TOP SOIL AND EXCAVATE FOOTING TO SOLID WORKING BASE MIN. 100kPa BEARING CAPACITY.
2. FILL ANY SOFT AREAS WITH ROAD BASE LAID & COMPACTED IN LAYERS NOT GREATER THAN 300mm

FOOTING / GROUND SLAB

3. FOOTINGS ARE TO BE FOUNDED ON NATURAL SUB GRADE ASSESSED AS A SOIL WITH SAFE BEARING CAPACITY OF 100kPa

CONCRETE NOTES

4. ALL CONCRETE SHALL COMPLY WITH THE CURRENT ISSUE OF AS3600.
5. CONCRETE SIZES SHOWN DO NOT INCLUDE FINISHES & MUST NOT BE REDUCED OR HOLED IN ANY WAY WITHOUT ENGINEERS APPROVAL.
6. CONCRETE SHALL CONFORM TO THE FOLLOWING :-

ELEMENTS	SLUMP	MAX. AGG.SIZE (mm)	STRENGTH GRADE FC (MPa)	MIXTURES
STRIP FOOTINGS	80	20	N32	NONE

7. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY & IS NOT NECESSARILY SHOWN IN THE TRUE POSITION.
8. ALL REINFORCEMENT TO HAVE MINIMUM COVER OF 50mm.
9. STEEL REINFORCEMENT IS TO BE ELECTRICALLY CONNECTED TO THE EARTH GRID WHERE SPECIFIED.
10. ALL FORMWORK TO EXTEND TYPICALLY 100mm BELOW FINISHED SURFACE LEVEL
11. ALL FORMED AND UNFORMED SURFACES HAVE A CLASS 3 FINISH IN ACCORDANCE WITH AS3610.

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE

DATE OF ISSUE: 24/06/2024

PURPOSE OF ISSUE: INFORMATION

PROJECT No. 805896

COMMENTS: TENDER ONLY

DESIGNED	M.Maley
DRAWN	A.Boserio
REVIEWED	C.Wing
APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING
FOOTING DETAIL
PLAN VIEW

SUPERSEDES:

essential energy

DRAWING NUMBER	SHT	VER
BRNC101	1/2	A

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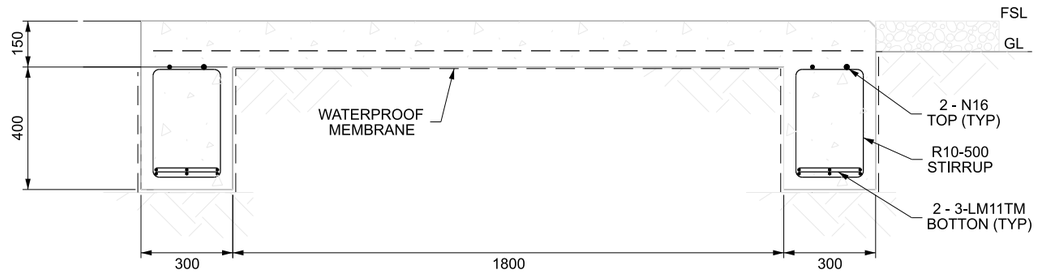
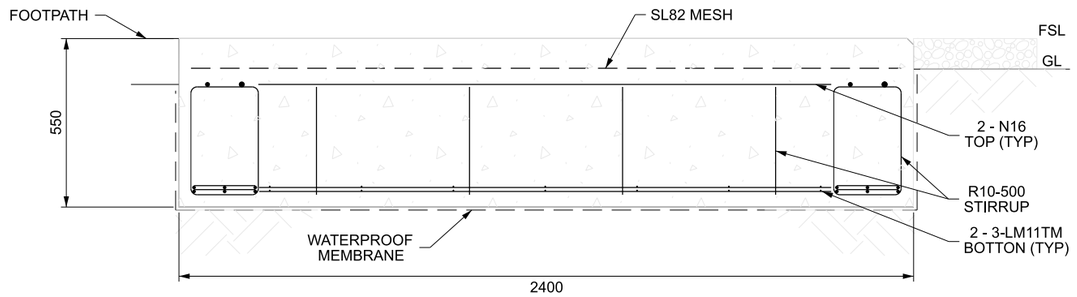


SECTION 1



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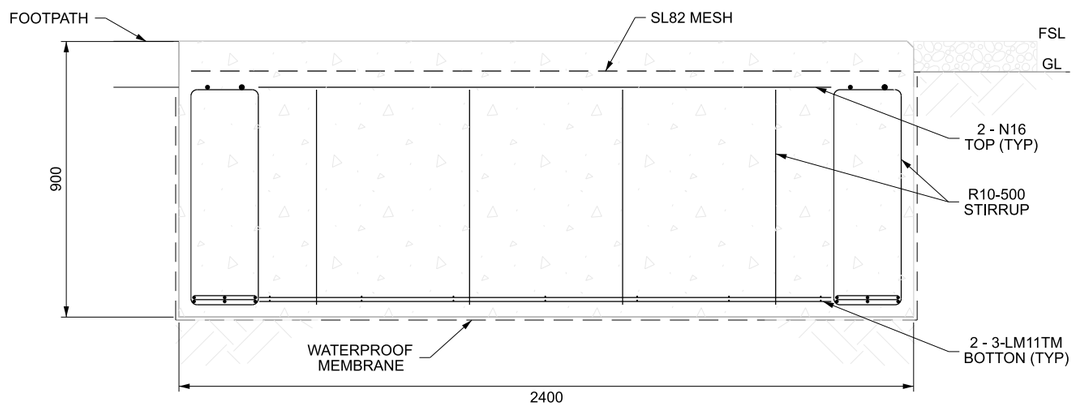

SECTION 3

THICKENED BEAMS AT EACH END OF FOOTING

LEGEND

FSL - FINISHED SURFACE LEVEL TO TOP OF 100mm THICK CRUSHED ROCK SURFACE

GL - GROUND LEVEL

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
CONTROL ROOM BUILDING
FOOTING SECTIONS DETAIL
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNC101	2/2	A

Printed By: ESSENPW11ICS01$
Printed: 6/24/2024 4:47:12 AM
CAD File: BRNC101-2.dgn

BROLGAN SUBSTATION BATTERY & TELECOMMUNICATIONS BUILDING

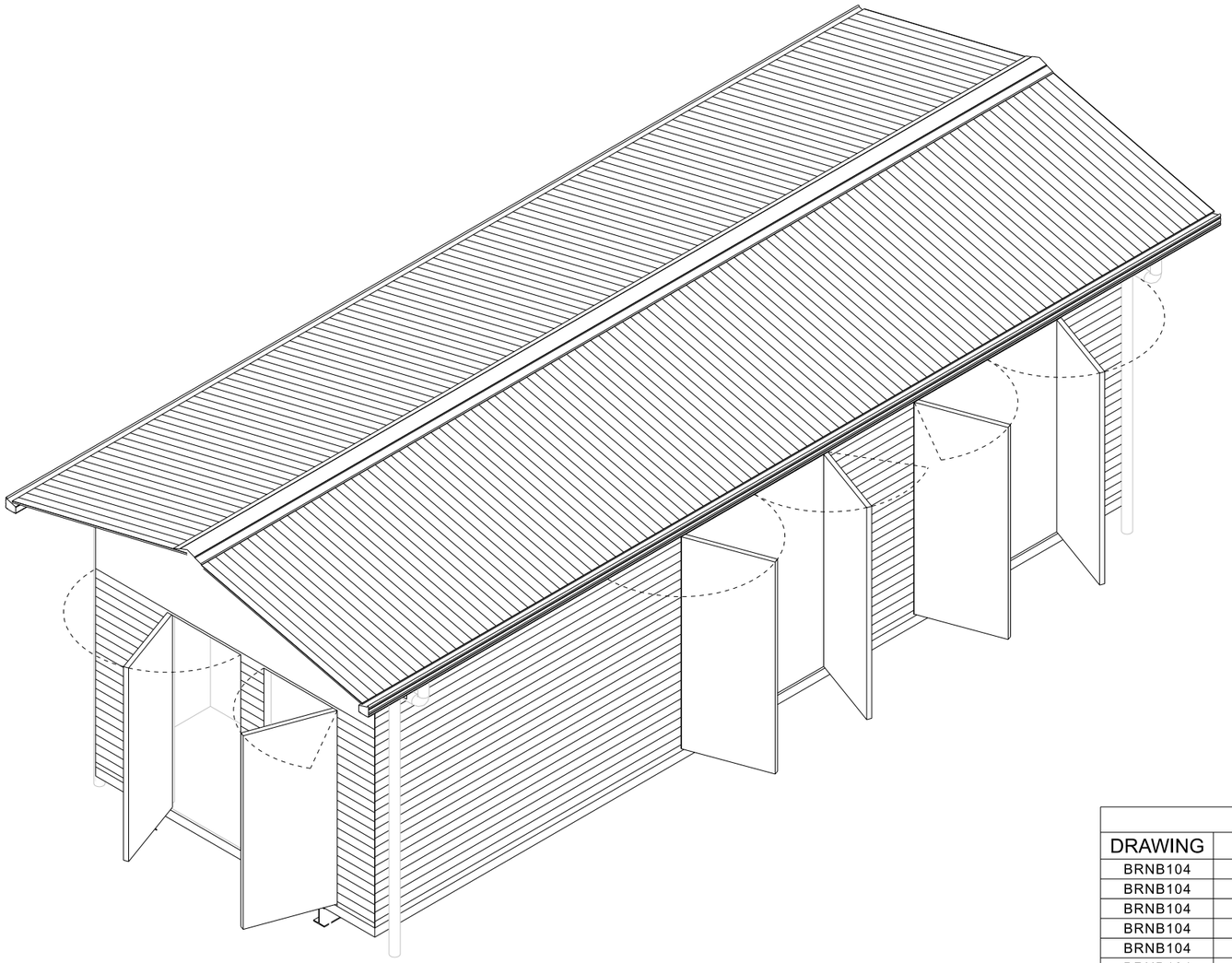

TABLE OF CONTENTS		
DRAWING	SHEET	DRAWING TITLE
BRNB104	1	BATTERY & TELECOMMUNICATIONS BUILDING COVER PAGE ARRANGEMENT
BRNB104	2	BATTERY & TELECOMMUNICATIONS BUILDING PLAN VIEW
BRNB104	3	BATTERY & TELECOMMUNICATIONS BUILDING ELEVATION
BRNB104	4	BATTERY & TELECOMMUNICATIONS BUILDING ELECTRICAL LAYOUT DETAIL
BRNB104	5	BATTERY & TELECOMMUNICATIONS BUILDING FLOOR LOADINGS DETAIL
BRNB104	6	BATTERY & TELECOMMUNICATIONS BUILDING WALL PENETRATIONS DETAIL
BRNB104	7	BATTERY & TELECOMMUNICATIONS BUILDING ROOF LOADINGS DETAIL
BRNB104	8	BATTERY & TELECOMMUNICATIONS BUILDING DRAINAGE & HYDRAULICS DETAIL

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE

DATE OF ISSUE: 24/06/2024

PURPOSE OF ISSUE: INFORMATION

PROJECT No. 805896

COMMENTS: NOT FOR CONSTRUCTION FOR TENDER ONLY

DESIGNED	M.Maley
DRAWN	A.Boserio
REVIEWED	C.Wing
APPROVED	J.Streatfeild

REFERENCE FILES

BRNC103-1 - TRANSPORTABLE BUILDINGS FOOTING DETAIL PLAN VIEW

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
COVER PAGE
ARRANGEMENT

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB104	1/8	A

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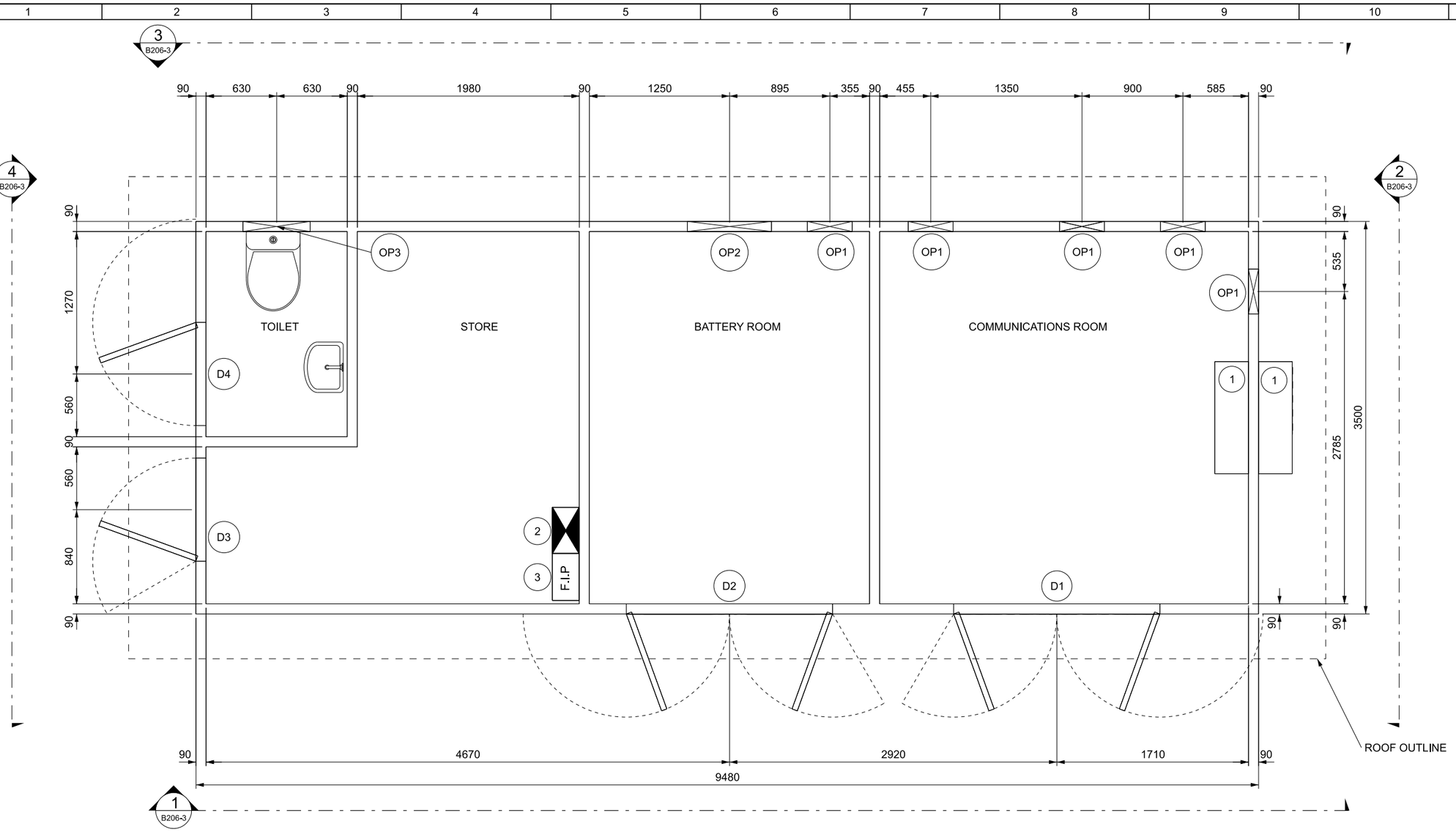
CAD File: BRNB104-1.dgn



LEGEND:

WALL PENETRATIONS
REFER TO BRNB104-6 FOR DETAIL

NOTE:

1. AIR CONDITIONER CONDENSERS SHALL BE INSTALLED ON OUTER WALL, MIN 200mm OFF TOP OF CONCRETE FOOTING.
2. DOWNPIPES (DP) SHALL BE PVC AND PAINTED TO MATCH COLORBOND - WOODLAND GREY.

CONTROL ROOM EQUIPMENT

ITEM	DESCRIPTION	REMARKS	QTY
14	-	-	-
13	-	-	-
12	-	-	-
11	-	-	-
10	-	-	-
9	-	-	-
8	-	-	-
7	-	-	-
6	-	-	-
5	-	-	-
4	-	-	-
3	FIRE PROTECTION PANEL	-	1
2	400/230V AC DISTRIBUTION PANEL	-	1
1	SPLIT SYSTEM AIR CONDITIONING	-	1
OP3	OPEN WALL PENETRATIONS - 600mm x 600mm	DRAWING BRNB104-6	1
OP2	OPEN WALL PENETRATIONS - 750mm x 600mm	DRAWING BRNB104-6	1
OP1	OPEN WALL PENETRATIONS - 400mm x 150mm	DRAWING BRNB104-6	5
CP1	CLOSED WALL PENETRATIONS - 400mm x 150mm	DRAWING BRNB104-6	0
D1	DOUBLE DOOR OPENING - 2 x 920mm DOOR LEAF	-	1
D2	DOUBLE DOOR OPENING - 2 x 920mm DOOR LEAF	-	1
D3	SINGLE DOOR OPENING - 1 x 920mm DOOR LEAF	-	1
D4	SINGLE DOOR OPENING - 1 x 920mm DOOR LEAF	-	1

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE

DATE OF ISSUE: 24/06/2024

PURPOSE OF ISSUE: INFORMATION

PROJECT No. 805896

COMMENTS: NOT FOR CONSTRUCTION FOR TENDER ONLY

DESIGNED	M.Maley
DRAWN	A.Boserio
REVIEWED	C.Wing
APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING

PLAN VIEW

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB104	2/8	A

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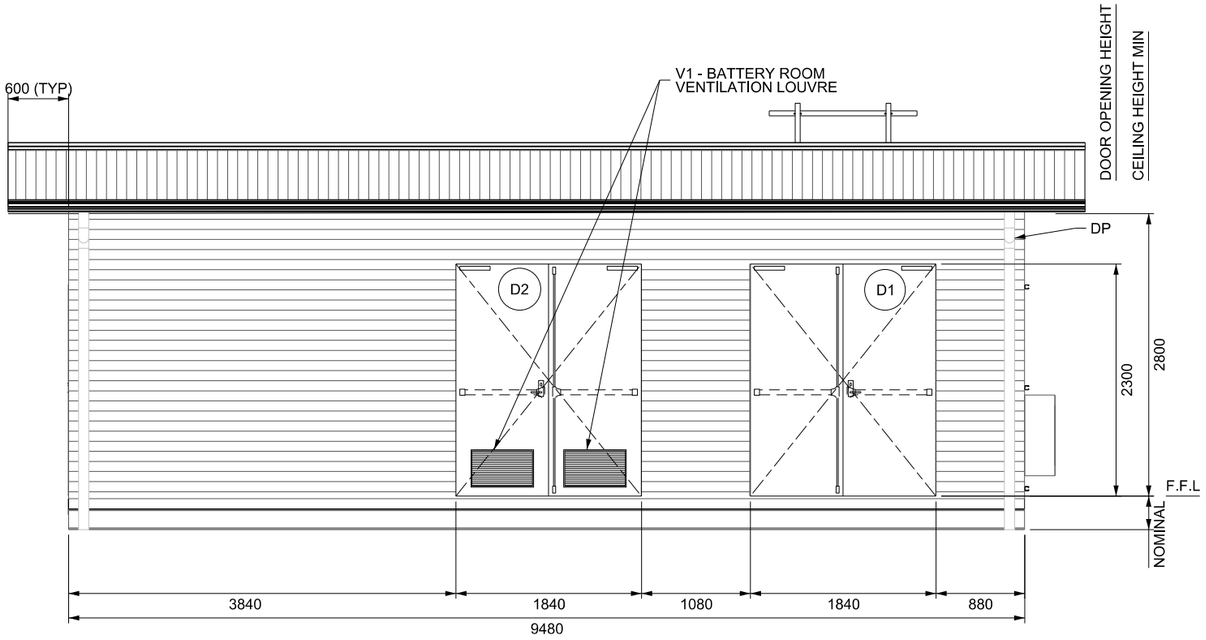
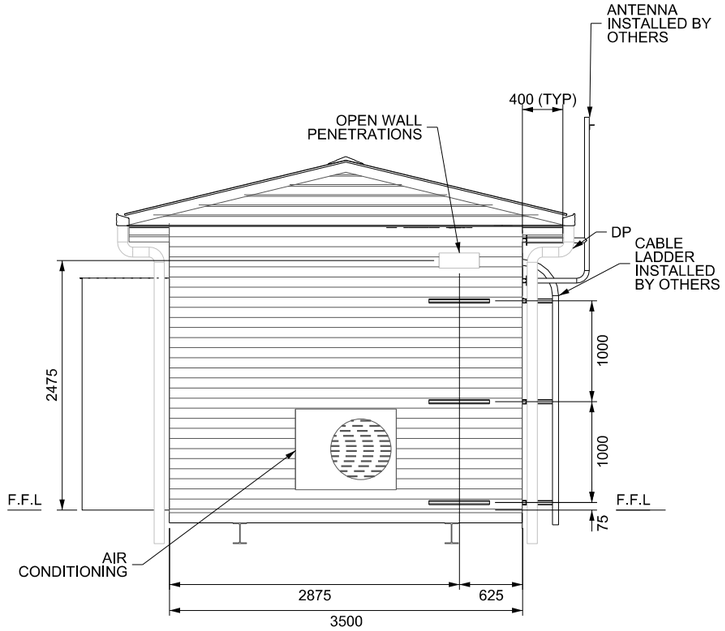
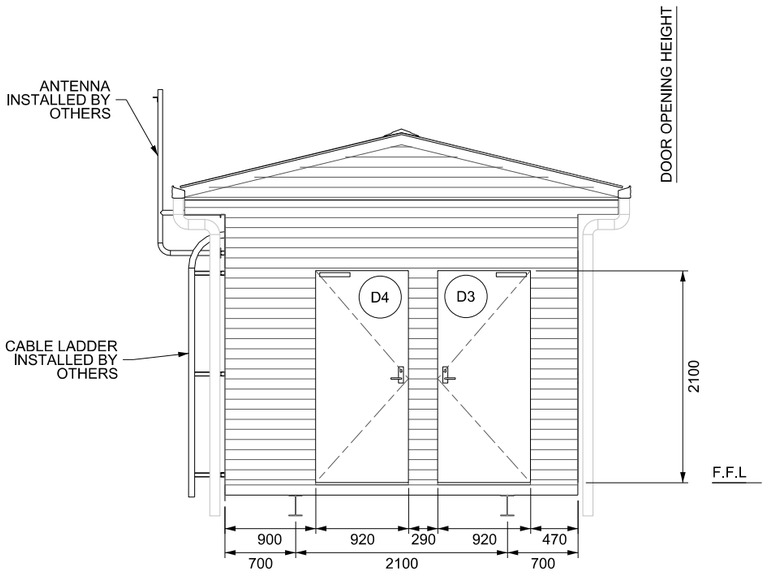


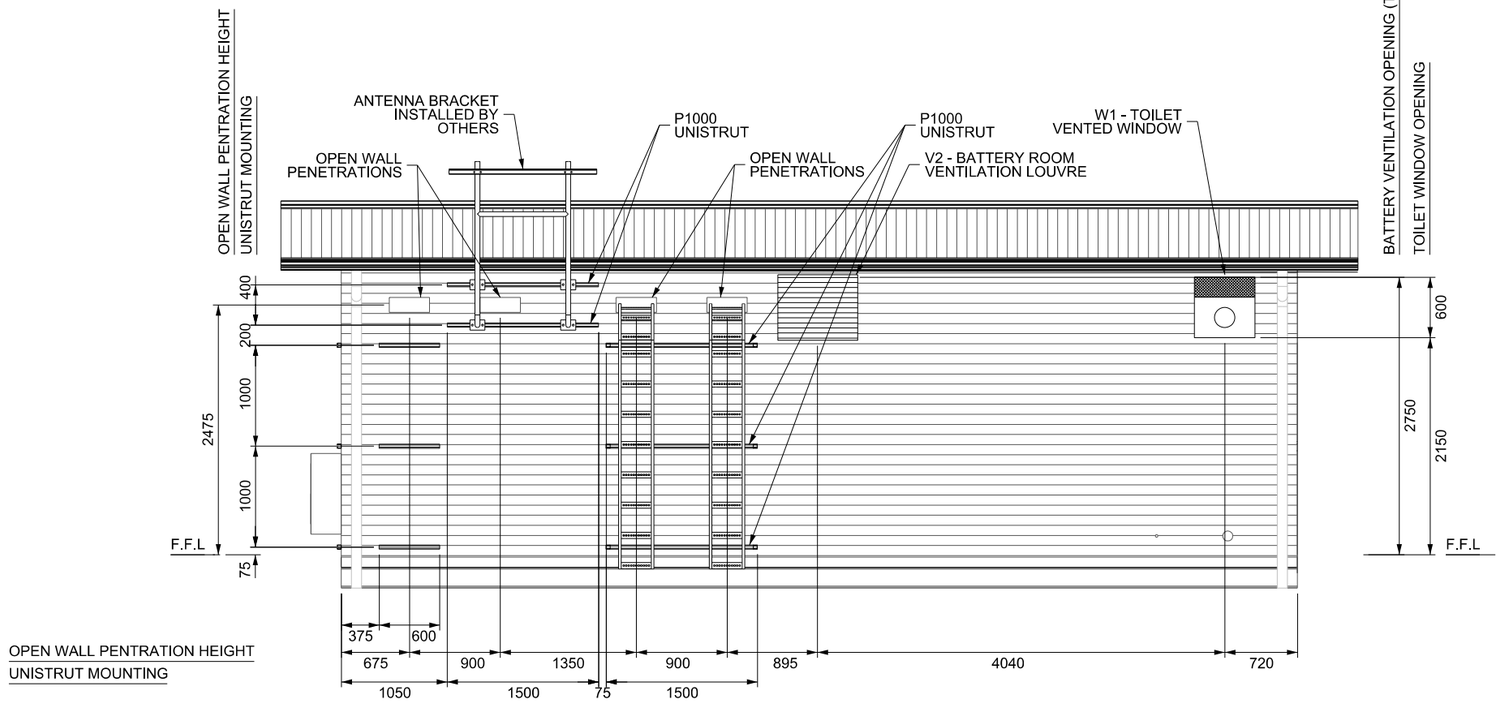
ELEVATION 1
FRONT VIEW



ELEVATION 2
RIGHT VIEW



ELEVATION 3
LEFT VIEW



OPEN WALL PENTRATION HEIGHT
UNISTRUT MOUNTING

ELEVATION 4
BACK VIEW

NOTE:

1. DOWNPIPES (DP) SHALL BE PVC AND PAINTED TO MATCH COLORBOND - WOODLAND GREY.
2. OUTDOOR MARAHALLING CUBICLE DOORS OMITTED FOR CLARITY.

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING

ELEVATION

SUPERSEDES:

essential energy

DRAWING NUMBER	SHT	VER
BRNB104	3/8	A

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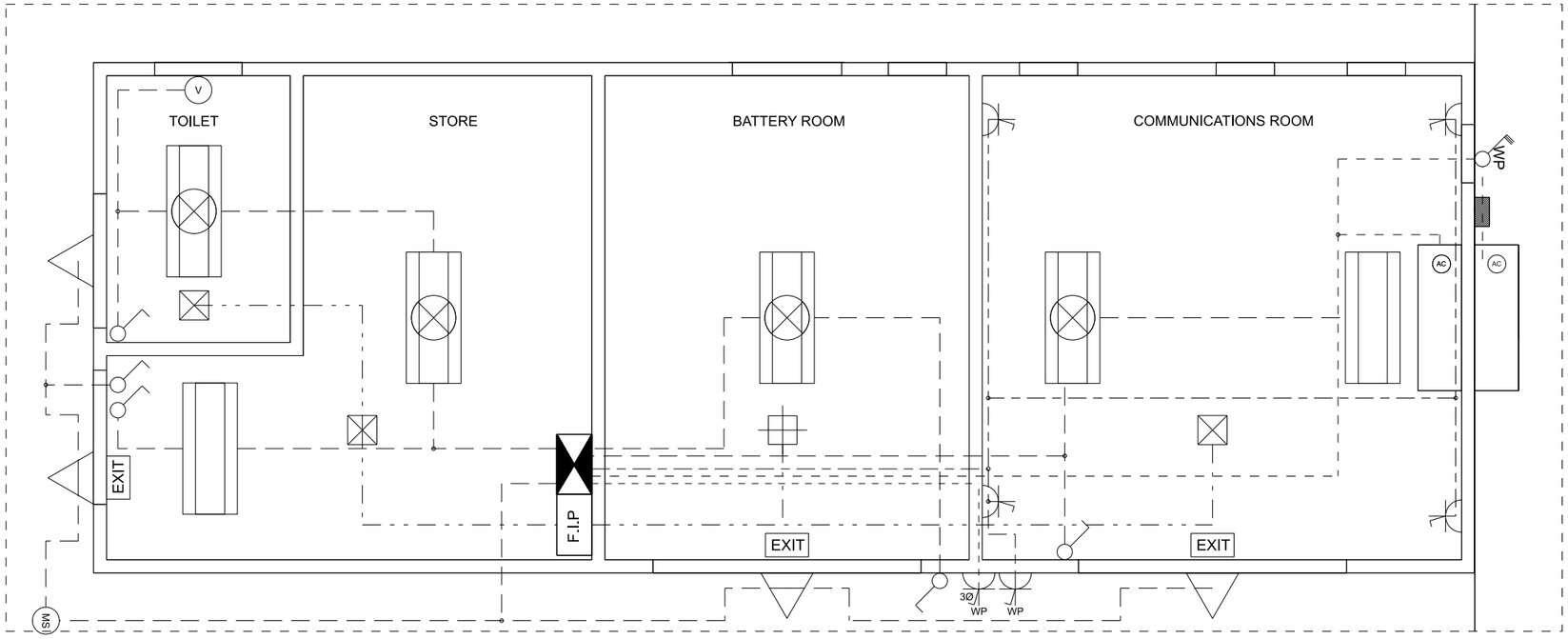
CAD File: BRNB104-3.dgn



AC DISTRIBUTION PANEL

F.I.P FIRE PANEL

V EXHAUST VENT

AC AIR CONDITIONING UNIT

2x18W LED TYPE FITTING
C/W DIFFUSERS WITH 1 MAINTAINED
TUBE ON BATTERY PACK

SINGLE 18W EXTERNAL LED
TYPE VANDAL PROOF LIGHT FITTINGS

2x18W LED TYPE
FITTINGS C/W DIFFUSER

EXIT 2X3W MAINTAINED LED
EXIT LIGHT FITTING

4 GANG RJ45
WALL MOUNT OUTLET

MS MOTION SENSOR

56 SERIES JUNCTION BOX

WP 1 PHASE, 10A, 230V
OUTDOOR ISOLATION SWITCH

WP 1 PHASE, 10A, 230V DUPLEX IP56
OUTDOOR GENERAL PURPOSE OUTLET

1 PHASE, 10A, 230V DUPLEX
GENERAL PURPOSE OUTLET

3Ø 3 PHASE, 16A, 400V
SPECIAL PURPOSE OUTLET

WP 3 PHASE, 16A, 400V IP56
3Ø OUTDOOR SPECIAL PURPOSE OUTLET

1 PHASE, 10A, 2 WAY LIGHT SWITCH

1 PHASE, 10A, 1 WAY LIGHT SWITCH

SMOKE DETECTOR

THERMAL DETECTOR

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
ELECTRICAL LAYOUT
DETAIL

SUPERSEDES:

essential energy

DRAWING NUMBER	SHT	VER
BRNB104	4/8	A

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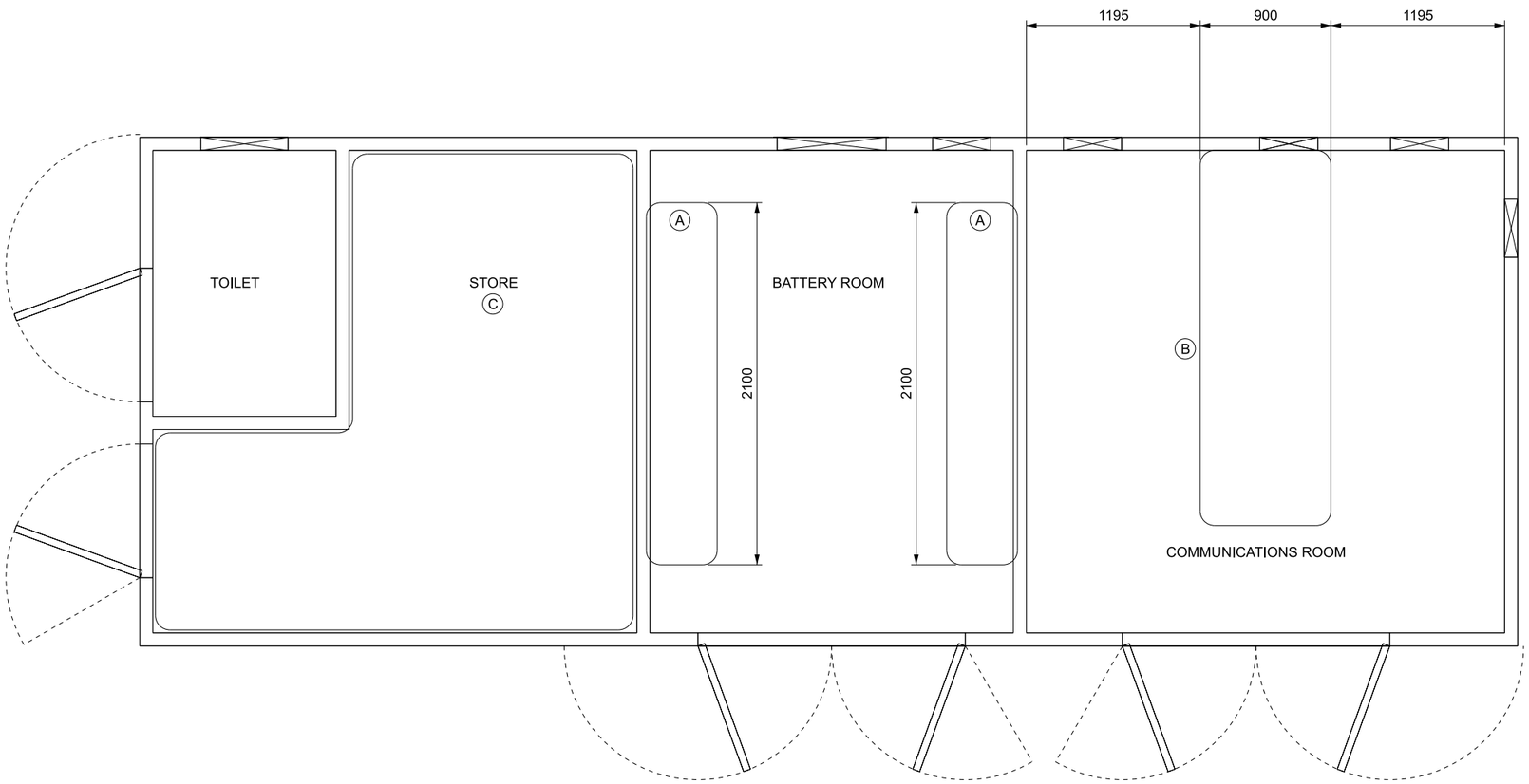
CAD File: BRNB104-4.dgn



PLAN VIEW

LEGEND:

WALL PENETRATIONS
REFER TO BRNB104 SHEET 2 FOR LOCATIONS

ITEM	DESCRIPTION	APPROX. WEIGHT	TOTAL WEIGHT
D	-	-	-
C	STORE ROOM	500kg	500kg
B	COMMUNICATIONS PANELS PANELS	50kg	200kg
A	110V DC BATTERY BANK	580kg	1160kg

CONTROL ROOM EQUIPMENT

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE

DATE OF ISSUE: 24/06/2024

PURPOSE OF ISSUE: INFORMATION

PROJECT No. 805896

COMMENTS: NOT FOR CONSTRUCTION FOR TENDER ONLY

DESIGNED	M.Maley
DRAWN	A.Boserio
REVIEWED	C.Wing
APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
FLOOR LOADINGS
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB104	5/8	A

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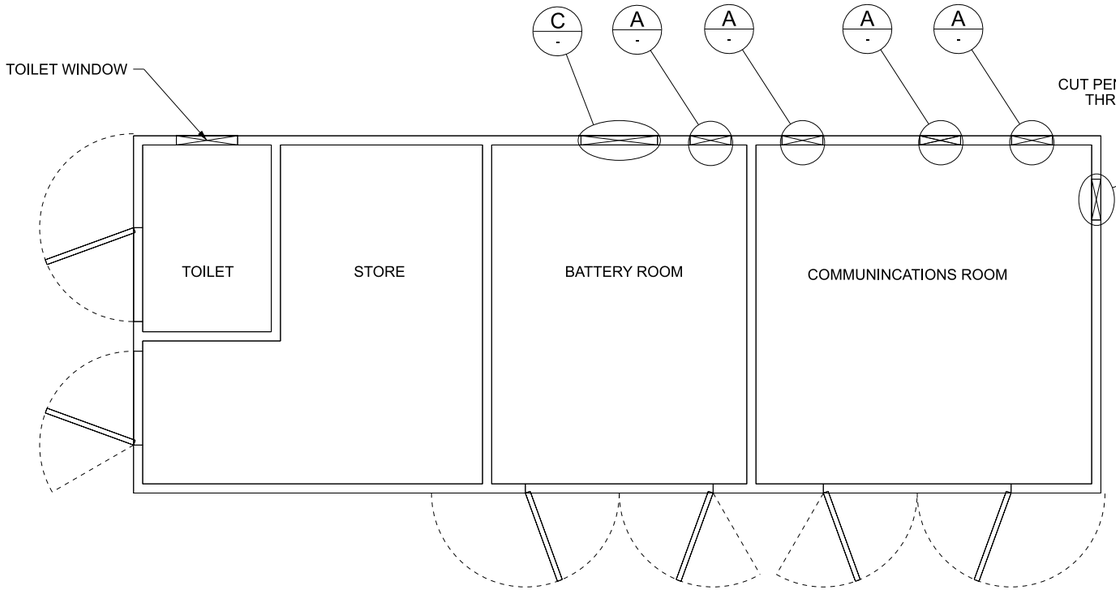
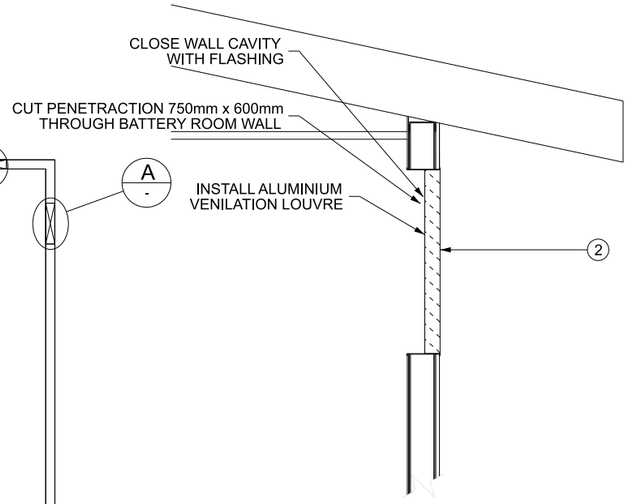
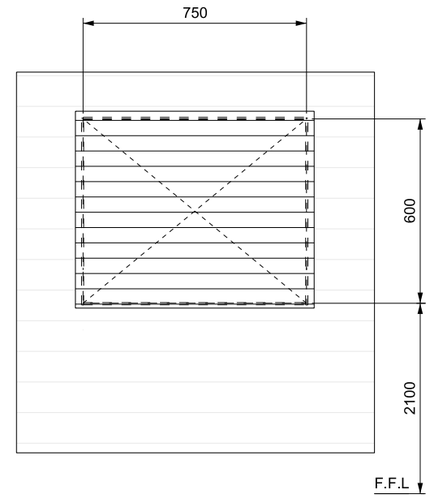
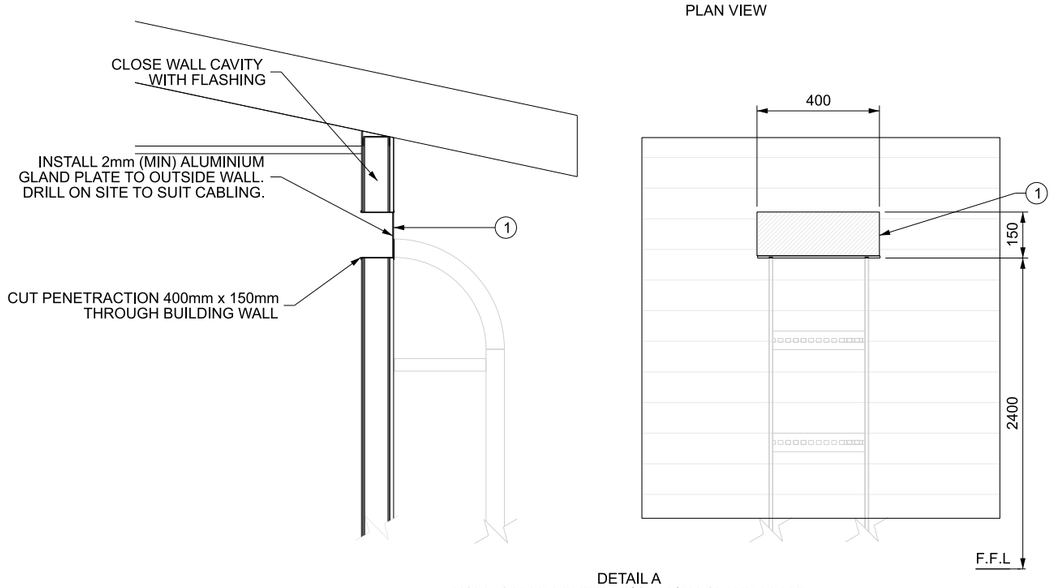


PLAN VIEW

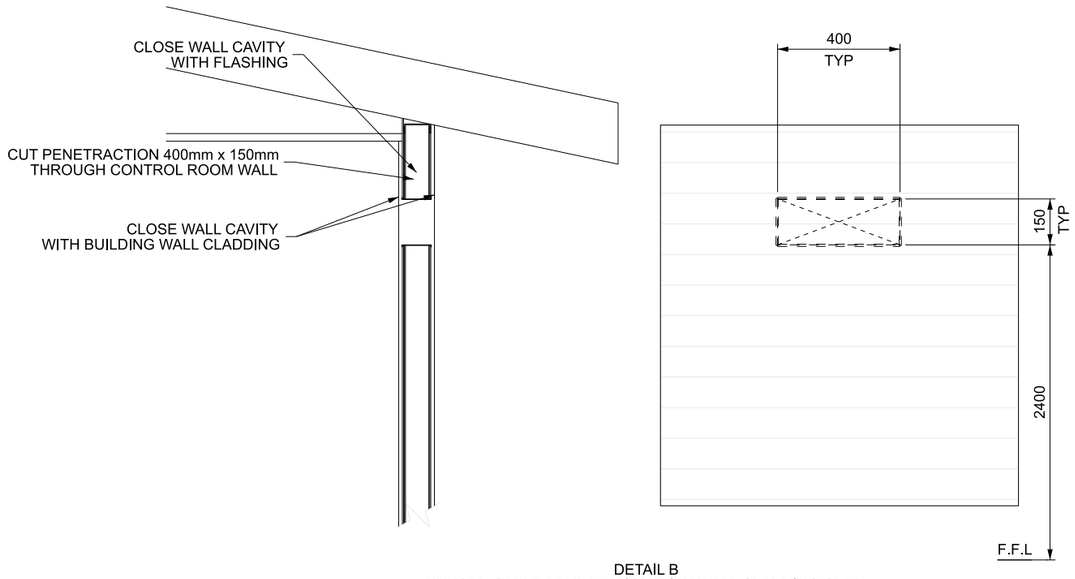




DETAIL C
VENTILATION LOUVRE



DETAIL A
USED CABLE PENETRATION WITH GLAND PLATE



DETAIL B
UNUSED CABLE PENETRATION WITH WALL CLADDING OVER

NOTES:

1. CABLE PENETRATIONS TO BE FILLED WITH FIRE PILLOWS.
   https://www.passivefirewarehouse.com.au/promat-promaseal-fire-pillows-small~3530

ITEM	DESCRIPTION	REMARKS	QTY
8	-	-	-
7	-	-	-
6	-	-	-
5	-	-	-
4	-	-	-
3	-	-	-
2	ALUMINIUM VENTILATION LOUVRE	BRNR104-1	1
1	2mm ALUMINIUM GLAND PLATE	-	5

CONTROL ROOM EQUIPMENT

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
WALL PENETRATIONS
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB104	6/8	A

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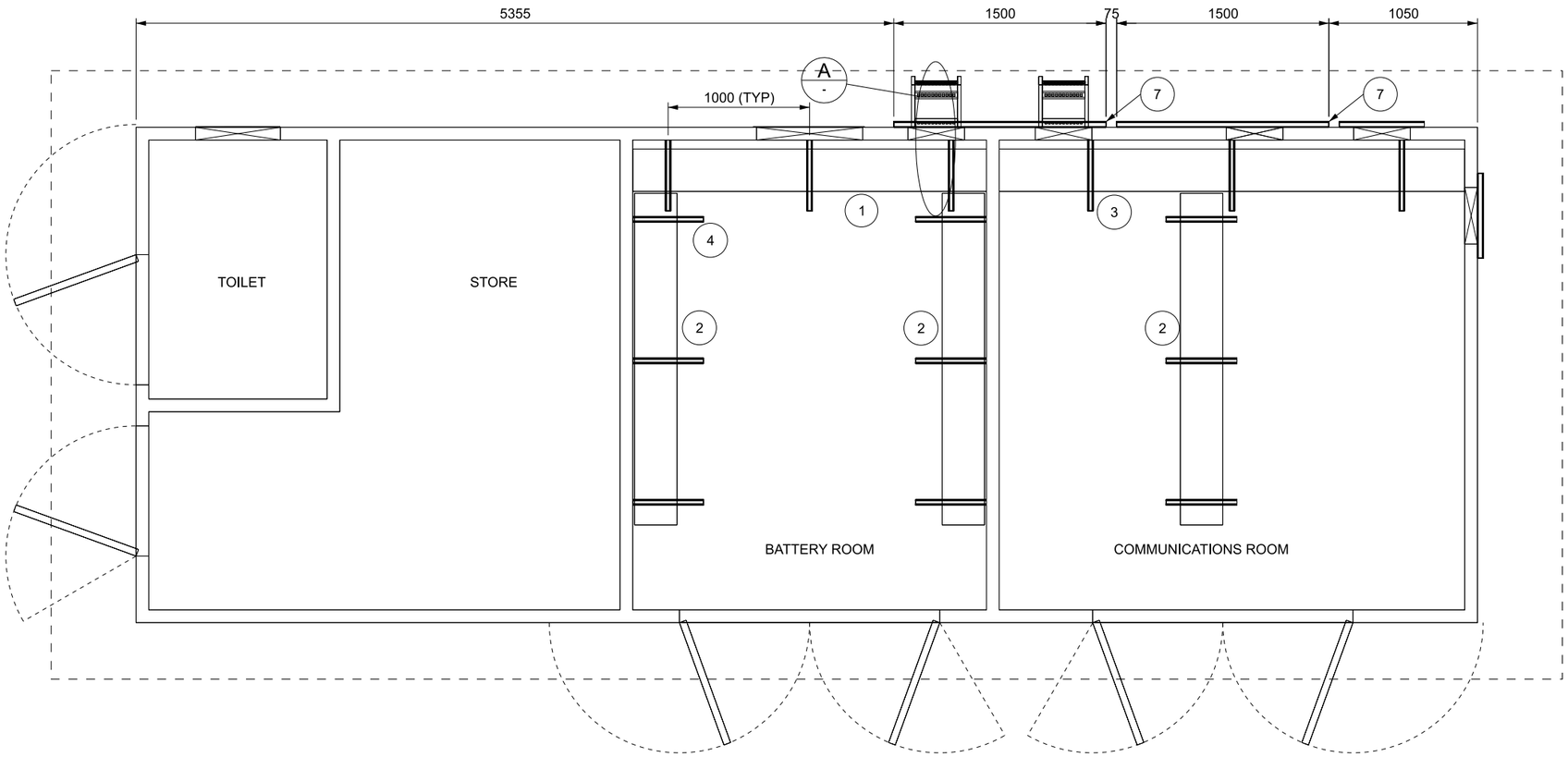

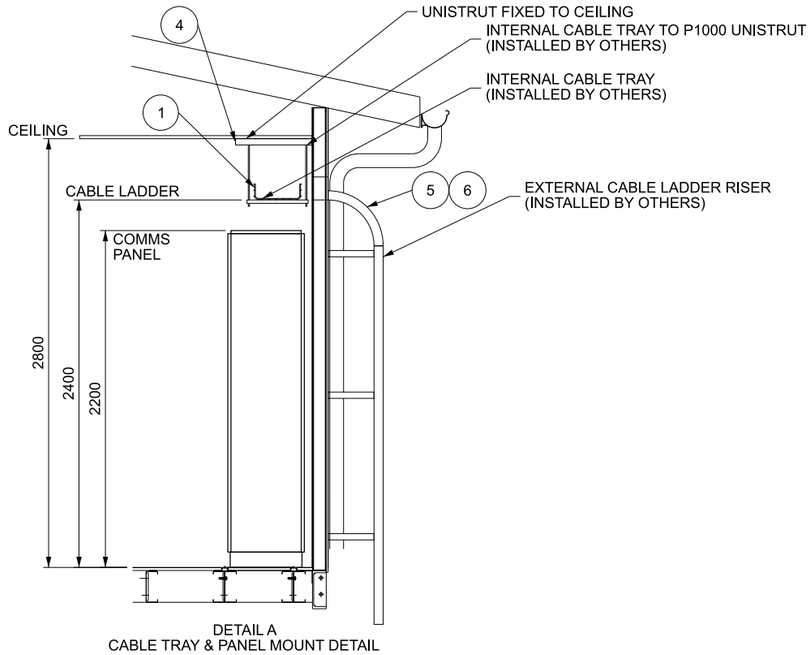

DETAIL A
CABLE TRAY & PANEL MOUNT DETAIL

LEGEND:

WALL PENETRATIONS
REFER TO BRNB104 SHEET 2 FOR LOCATIONS

CABLE LADDER

NOTES:

1. CABLE TRAY INSTALLED IN CONTROL ROOM TO BE EARTHED AT PROTECTION & CONTROL PANEL EARTH BARS.
2. P1000 UNISTRUT TO BE FIXED TO ROOF TRUSS OR BUILDING FRAME.

ITEM	DESCRIPTION	APPROX. WEIGHT	TOTAL WEIGHT
D	-	-	-
C	-	-	-
B	-	-	-
A	CABLE TRAY & PROTECTION & CONTROL CABLING	25kg/m	735kg

CONTROL ROOM EQUIPMENT LOADING

ITEM	DESCRIPTION	PART NO.	QTY	REMARKS
7	P1000 UNISTRUT MOUNTS - 1500mm LENGTHS	P1000-HG	5	SEE BRNB104-3
6	CABLE LADDER STANDARD COVER, 12B 300mm	NEMA LAM6043	2	INSTALLED BY OTHERS
5	300W, 300R 12B EXTERNAL RISER	NEMA LEE134	2	INSTALLED BY OTHERS
4	P1000 UNISTRUT - 500mm LENGTHS	P1000-HG	AS REQ	-
3	300W ACROFIL TRIPPLE ROD REINFORCED TRAY (100mm DEPTH)	AF100-300	3.2m	INSTALLED BY OTHERS
2	300W ACROFIL TRIPPLE ROD REINFORCED TRAY (100mm DEPTH)	AF100-300	2.3m	INSTALLED BY OTHERS
1	300W ACROFIL TRIPPLE ROD REINFORCED TRAY (100mm DEPTH)	AF100-300	2.5m	INSTALLED BY OTHERS

CONTROL ROOM EQUIPMENT LOADING

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE	PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE: 24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE: INFORMATION			REVIEWED	C.Wing
			APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
ROOF LOADINGS
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB104	7/8	A

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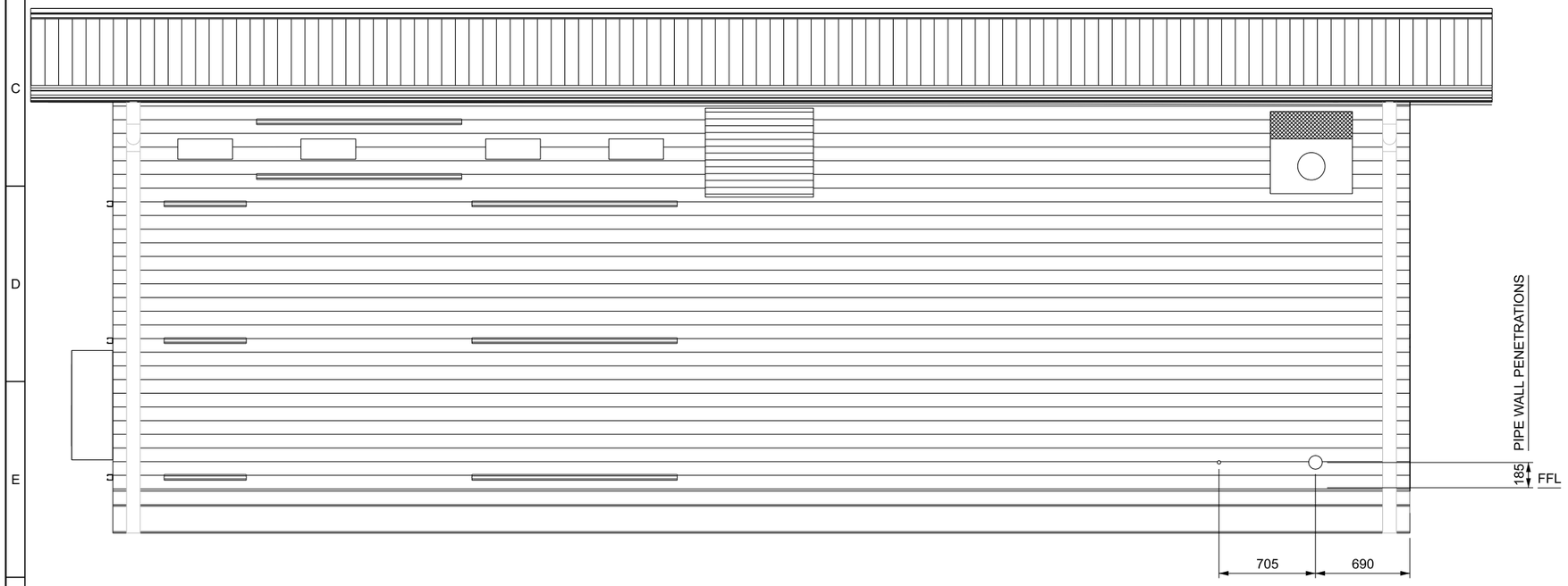
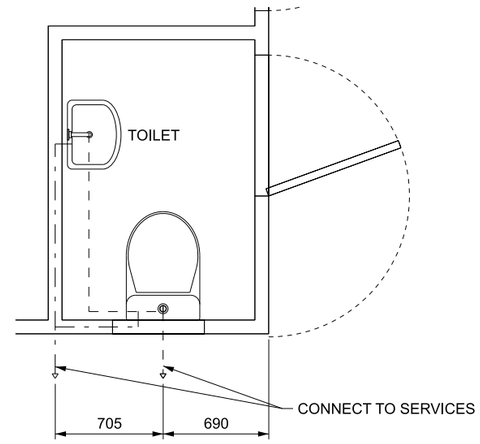


ELEVATION 4
BACK



TOILET PLAN VIEW

LEGEND:

- BUILDING SERVICES WATER LINE
- STORMWATER DRAINGE LINE
- SANITARY DRAINAGE LINE

NOTES:

1. TOILET SANITARY DRAINAGE LINE SHALL BE Ø100mm CLASS SN8 RPJ uPVC & EXTEND SUITABLE LENGTH FROM WALL FOR EXTERNAL CONNECTION.
2. TOILET WATER SUPPLY LINE SHALL BE Ø25mm WATER PIPE & EXTEND SUITABLE LENGTH FROM WALL FOR EXTERNAL CONNECTION.
3. PROPOSED SEWER LINE CONNECTED TO SEPTIC TANK/ TOWN SEWER TO BE Ø100mm PIPE.
4. ALL PLUMBING WORKS SHALL BE IN ACCORDANCE WITH AS 3500. LOCAL WATER AUTHORITY, THE BUILDING CODE OF AUSTRALIA, & WATER GUIDELINES.

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	NOT FOR CONSTRUCTION FOR TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
DRAINAGE & HYDRAULICS
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNB104	8/8	A

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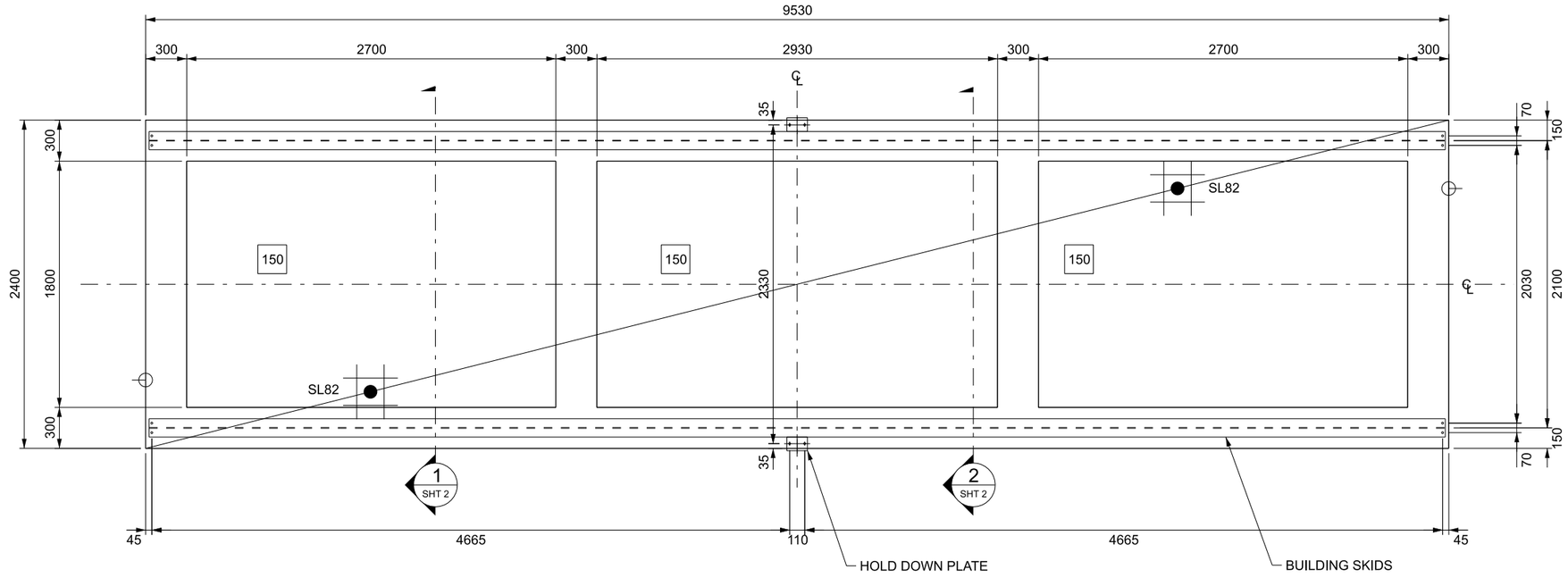

APPROXIMATE CONCRETE VOLUME = 6.5m³
APPROXIMATE REINFORCEMENT WEIGHT = 220kg

LEGEND

⏚ DULMISON C70 EARTH BOND CONNECTED TO CONCRETE STEEL REINFORCING

BUILDING INSTALLATION NOTES

1. BUILDING HOLD DOWN BOLTS SHALL BE M12 x 70mm GALVANISED DYNABOLT OR EQUIVALENT, IN ACCORDANCE WITH CONTRACTOR'S STRUCTURAL ENGINEERS INSTRUCTIONS.
2. HOLD DOWN BOLTS SHALL BE DRILLED AND INSTALLED AT THE TIME OF THE BUILDING INSTALLATION.
3. HOLD DOWN BOLT LOCATIONS SHOWN ON DRAWING ARE INDICATIVE AND SHALL BE CONFIRMED BY CONTRACTOR BEFORE INSTALLATION.
4. CONTRACTOR SHALL ACCURATELY MEASURE ALL INSTALLED HOLD DOWN BOLTS AND MARK-UP DRAWING.

SITE PREPARATION DETAILS

1. REMOVE ALL TOP SOIL AND EXCAVATE FOOTING TO SOLID WORKING BASE MIN. 100kPa BEARING CAPACITY.
2. FILL ANY SOFT AREAS WITH ROAD BASE LAID & COMPACTED IN LAYERS NOT GREATER THAN 300mm

FOOTING / GROUND SLAB

3. FOOTINGS ARE TO BE FOUNDED ON NATURAL SUB GRADE ASSESSED AS A SOIL WITH SAFE BEARING CAPACITY OF 100kPa

CONCRETE NOTES

4. ALL CONCRETE SHALL COMPLY WITH THE CURRENT ISSUE OF AS3600.
5. CONCRETE SIZES SHOWN DO NOT INCLUDE FINISHES & MUST NOT BE REDUCED OR HOLED IN ANY WAY WITHOUT ENGINEERS APPROVAL.
6. CONCRETE SHALL CONFORM TO THE FOLLOWING :-

ELEMENTS	SLUMP	MAX. AGG.SIZE (mm)	STRENGTH GRADE FC (MPa)	MIXTURES
STRIP FOOTINGS	80	20	N32	NONE

7. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY & IS NOT NECESSARILY SHOWN IN THE TRUE POSITION.
8. ALL REINFORCEMENT TO HAVE MINIMUM COVER OF 50mm.
9. STEEL REINFORCEMENT IS TO BE ELECTRICALLY CONNECTED TO THE EARTH GRID WHERE SPECIFIED.
10. ALL FORMWORK TO EXTEND TYPICALLY 100mm BELOW FINISHED SURFACE LEVEL
11. ALL FORMED AND UNFORMED SURFACES HAVE A CLASS 3 FINISH IN ACCORDANCE WITH AS3610.

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
FOOTING DETAIL
PLAN VIEW

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNC103	½	A

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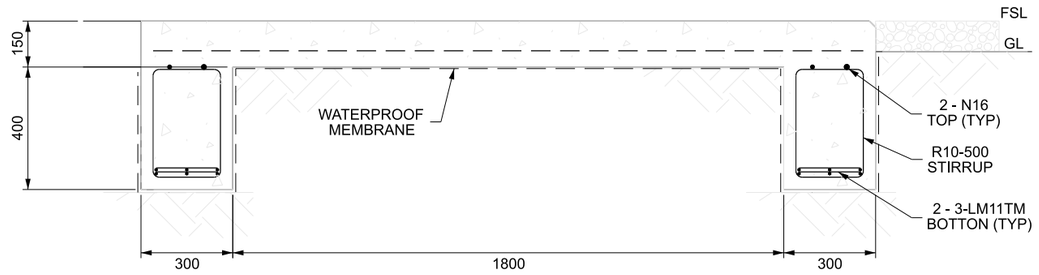
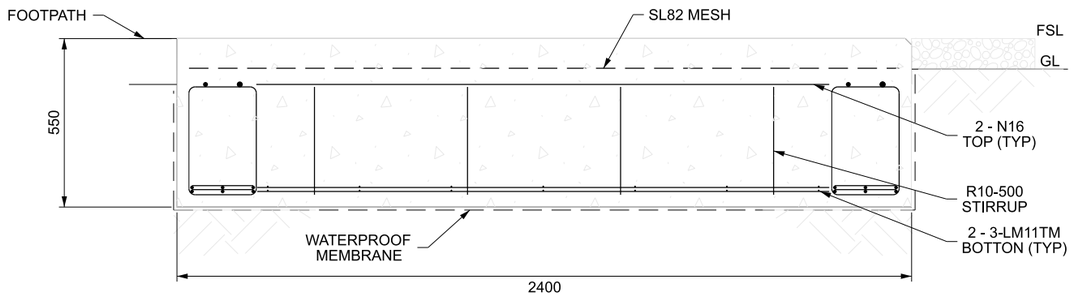


SECTION 1



SECTION 2

LEGEND

FSL - FINISHED SURFACE LEVEL TO TOP OF 100mm THICK CRUSHED ROCK SURFACE

GL - GROUND LEVEL

ALL DIMENSIONS ARE IN mm U.N.O. DO NOT SCALE		PROJECT No. 805896	COMMENTS	DESIGNED	M.Maley
DATE OF ISSUE	24/06/2024	TENDER ONLY		DRAWN	A.Boserio
PURPOSE OF ISSUE	INFORMATION			REVIEWED	C.Wing
				APPROVED	J.Streatfeild

BROLGAN
132/11kV ZONE SUBSTATION
BATTERY & TELECOMMUNICATION BUILDING
FOOTING SECTIONS DETAIL
DETAIL

SUPERSEDES:

DRAWING NUMBER	SHT	VER
BRNC103	2/2	A

Printed By: ESSENPW11ICS01$
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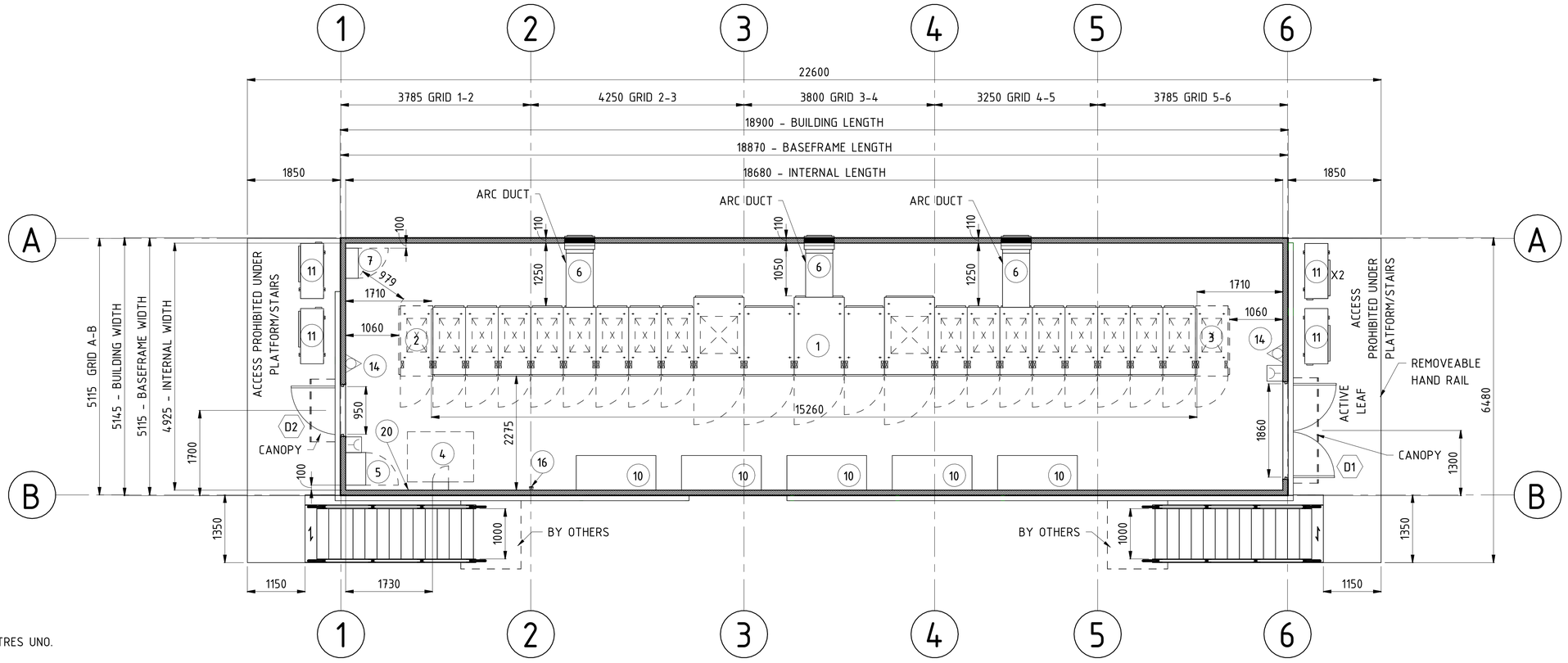
CAD File: BRNC103-2.dgn



GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNO.
2. CEILING HEIGHT TO BE 3200mm.
3. BUILDING IS NON FIRE RATED.
4. NO FIRE SUPPRESSION.

1 GENERAL ARRANGEMENT PLAN

SCALE 1 : 50

BUILDING EQUIPMENT TABLE									
ITEM NO.	QTY.	EQUIPMENT TAG	DESCRIPTION	SUPPLIER	WIDTH	DEPTH	HEIGHT	WEIGHT (kg)	HEAT LOSS (W)
1	21	SB1	11KV SWITCHGEAR	MAYFIELD	15260	1600	2820	16800	5250
2	1	-	11KV SWITCHGEAR - FUTURE	MAYFIELD	650	1400	2820	600	0
3	1	-	11KV SWITCHGEAR - FUTURE	MAYFIELD	650	1400	2820	600	0
4	1	-	FIRE INDICATION PANEL	MAYFIELD	320	165	400	50	20
5	1	-	415 AC DB	MAYFIELD	650	400	2100	150	50
6	3	-	11KV SWITCHGEAR ARC DUCT	MAYFIELD	-	-	-	-	-
7	1	-	SECURITY CABLE MARSHALLING BOX	MAYFIELD	600	250	600	50	0
10	5	-	SPLIT SYSTEM AIR CONDITIONER - INDOOR UNIT	MAYFIELD	1590	690	235	190	-
11	5	-	SPLIT SYSTEM AIR CONDITIONER - OUTDOOR UNIT	MAYFIELD	1100	532	870	475	-
14	2	-	CO2 FIRE EXTINGUISHER - INTERNAL	MAYFIELD	-	-	-	25	-
16	1	-	MAIN EARTH BAR	MAYFIELD	80	10	1200	10	0
19	1	-	SIGN - BUILDING ID	MAYFIELD	1500	-	400	0	-
20	1	-	RESUSCITATION CHART	MAYFIELD	300	0	420	0	0
21	2	-	SIGN - DANGER HIGH VOLTAGE AUTHORISED ACCESS ONLY	MAYFIELD	450	-	300	0	-
								18950	5320

DOOR SCHEDULE						
DOOR NUMBER	SINGLE/ DOUBLE	CLEAR OPENING WIDTH	CLEAR OPENING HEIGHT	FRAME TYPE	FIRE RATING	ACCESORIES
D1	DOUBLE	1860 (950+910)	2500	TYPE P	N/A	INTERNAL PANIC BAR + WEATHERPROOFING
D2	SINGLE	950	2220	TYPE P	N/A	INTERNAL PANIC BAR + WEATHERPROOFING

Revision	Date	Designed	Drawn	Checked	PM	Description
A	20/06/2024	JA	JA			FOR TENDER

JOB NO. T240552 | COST CODE

DRAWING STATUS: FOR TENDER

mayfield
Mayfield Industries
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Client: ESSENTIAL ENERGY

Client Dwg. No.:

Designed: JA	Job No. T240552	Title:	ESSENTIAL ENERGY BROLGAN ZONE 11kV SWITCHROOM GENERAL ARRANGEMENT PLAN
Drawn: JA			
Checked:	Scale: 1 : 50		
Date: 20/06/2024			

A1 | Drawing No. T240552-24-S0101-001 | Sheet 1 of 1 | Revision A

Appendix B: EPBC Protected Matters Search

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 09-Oct-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	39
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	9
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	700 - 800km upstream from Ramsar site	In feature area
Hattah-kulkyne lakes	500 - 600km upstream from Ramsar site	In feature area
Riverland	600 - 700km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	800 - 900km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities			[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species			[Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area	In feature area
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	Endangered	Species or species habitat known to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Maccullochella peelii			
Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macquaria australasica			
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Crinia sloanei			
Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area
Nyctophilus corbeni			
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Androcalva procumbens			
[87153]	Vulnerable	Species or species habitat may occur within area	In feature area
Austrostipa metatoris			
[66704]	Vulnerable	Species or species habitat may occur within area	In feature area
Austrostipa wakoolica			
[66623]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In buffer area only
Vincetoxicum forsteri listed as Tylophora linearis [92384]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [15115]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [15117]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [15113]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [15641]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [15112]	NSW	In buffer area only
Defence		
Defence - PARKES TRAINING DEPOT ; PARKES ACS LAND [11198]	NSW	In buffer area only
Defence - PARKES TRAINING DEPOT ; PARKES ACS LAND [11197]	NSW	In buffer area only
Education, Science and Training - CSIRO		
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [15116]	NSW	In buffer area only
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation [15114]	NSW	In buffer area only

Listed Marine Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chalcites osculans as Chrysococcyx osculans			
Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster			
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Lathamus discolor			
Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Merops ornatus			
Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma			
Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Mara Team Testing - Jason	2024/09834		Post-Approval	In buffer area only
Controlled action				
Parkes to Narromine Section Inland Rail, NSW	2016/7731	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Construction of Single Circuit 132 kV Transmission Line between existing substations	2009/4741	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

Department of Climate Change, Energy, the Environment and Water
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Appendix C: AHIMS Searches

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 805896 Parkes

Client Service ID : 930100

Essential Energy Land & Routes Port Macquarie

8 Buller St

Port Macquarie New South Wales 2444

Attention: Nathan Hegerty

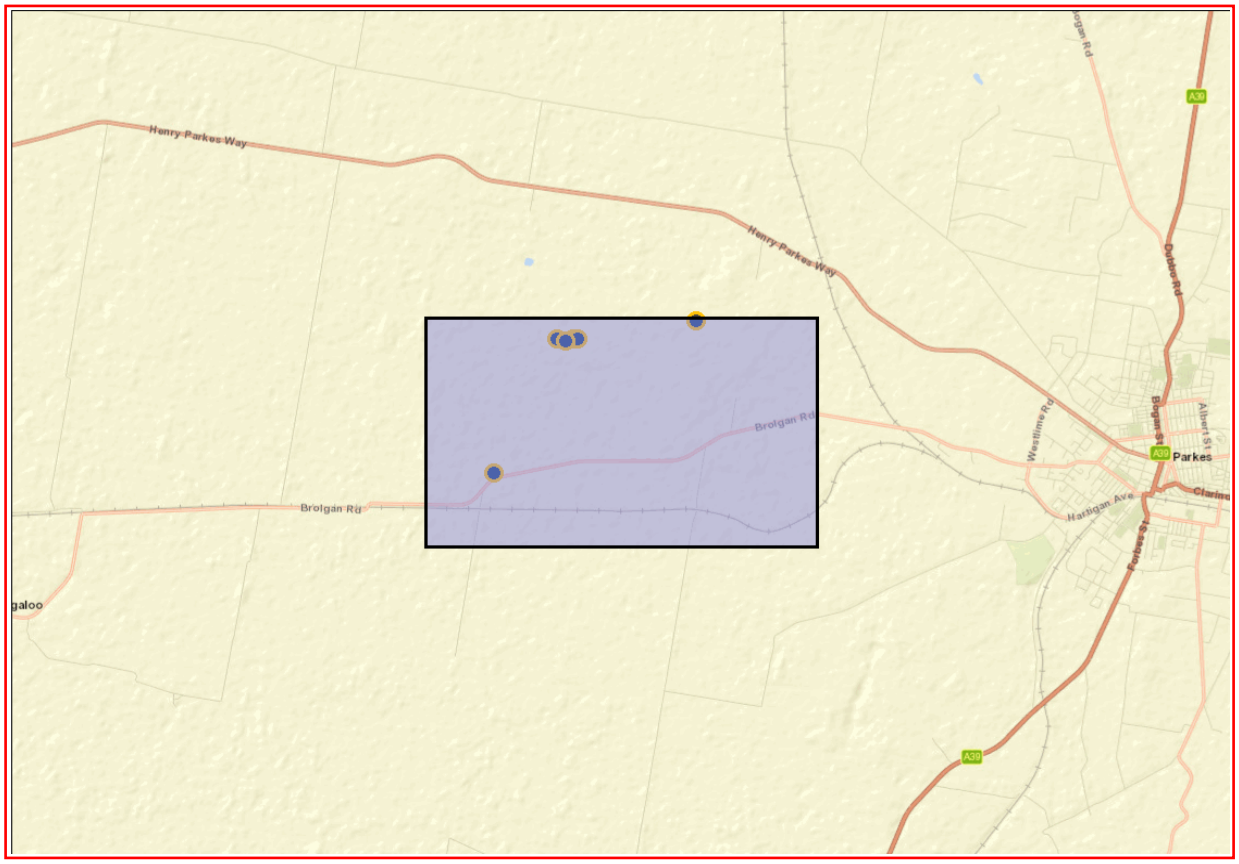
Email: nathan.hegerty@essentialenergy.com.au

Date: 12 September 2024

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.1487, 148.0569 - Lat, Long To : -33.1177, 148.1187, conducted by Nathan Hegerty on 12 September 2024.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

7	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 805896 Parkes

Client Service ID : 930100

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
43-3-0136	Parkes Solar Relocated Artefacts	GDA	55	600667	6334791	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Matthew Barber,NGH Heritage - Fyshwick					**Permits**		
43-3-0115	Parkes Solar IF3	GDA	55	600780	6334824	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Matthew Barber,Mr.Matthew Barber,NGH Heritage - Fyshwick,NGH Heritage - F					**Permits**		
43-3-0116	Parkes Solar IF2	GDA	55	600844	6334824	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Matthew Barber,Mr.Matthew Barber,NGH Heritage - Fyshwick,NGH Heritage - F					**Permits**		
43-3-0117	Parkes Solar IF1	GDA	55	600530	6334822	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Matthew Barber,Mr.Matthew Barber,NGH Heritage - Fyshwick,NGH Heritage - F					**Permits**		
43-3-0122	GSF-14 Artefact Cluster	GDA	55	602582	6335080	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management - Dubbo,Access Archaeology and I					**Permits**		
43-3-0123	GSF-13 Isolated Artefact	GDA	55	602582	6335080	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	OzArk Environmental and Heritage Management - Dubbo,Access Archaeology and I					**Permits**		
43-3-0170	Parkes SAP IF-5	GDA	55	599595	6332829	Open site	Valid	Artefact : -		104778
	Contact	**Recorders**	OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron					**Permits**		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 12/09/2024 for Nathan Hegerty for the following area at Lat, Long From : -33.1487, 148.0569 - Lat, Long To : -33.1177, 148.1187. Number of Aboriginal sites and Aboriginal objects found is 7

essential-energy
EssentialEnergyAU
essential_au
essentialenergytv

essentialenergy.com.au

Essential Energy