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Tel: 0409 494 183
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6th October 2023

Chief Executive Officer
Douglas Shire Council PO Box 723
MOSSMAN QLD 4873

Attention: Rebecca Taranto – Compliance Officer (rebecca.taranto@douglas.qld.gov.au)

Dear Rebecca

RE: Development Application seeking a Development Permit for a Material Change of Use & Reconfiguring of a Lot, Lot 5 BK157130, 174 Buchanan Creek Road, Operational works

With respect to the above Development Application, Environment Pacific has been engaged by Volt Advisory (the proponent) to provide planning and environmental services in submitting a Development Application for assessment which seeks to secure a lease area and establish a renewable energy facility (being a combined hydrogen/solar renewable energy plant) on lot 5 BK157130. Operational works within the solar farm include earthworks for drainage and internal access.

We note that DA Form 1, and the associated supporting planning report have been reviewed and amended by McPeake Planning as per requirements noted in Action Notice 2.

We appreciate that there is significant community interest in the Daintree Microgrid Project, and we have endeavored to provide as much clarity as possible around the technical, social and environmental aspects of this project in the various attachments.

In support of the application, please find following attached:

**DA Form 1 –
Planning Report**

- SARA Prelodgment Advice – Appendix A
- Lease Plan prepared by RPS – Appendix B
- Owners Consent – Appendix C
- Technical Descriptions – Appendix D
- Plans of Development – Appendix E
- Contaminated Land Register and Environmental Register Searches – Appendix F
- DMG Project Environmental Management Plan – Appendix G
- Geotechnical Investigations – Appendix H
- Visual amenity assessment – Appendix I
- Letter of support from Jabalbina – Appendix J
- Assessment of the applicable codes under the Planning Scheme (2018) – Appendix K
- Planning Scheme Map Overlays – Appendix L

In accordance with s51(2) of *Planning Act 2016*, landowners' consent for the road reserve within lot 5 BK157130 (Department of Resources) and for the lease plan area (Dennis Verri) has been provided in **Appendix C**.

We trust this application and supporting information meets the requirements of the *Planning Act 2016* and can now be progressed for assessment.

Should you require any further information or clarification on any matters regarding this application, please do not hesitate to contact me as below

Sincerely

A handwritten signature in black ink, appearing to read 'Andrew Small', with a stylized flourish extending to the right.

Andrew Small, PhD, Director
Environment Pacific

Tel: 0409 494 183 Email: andrew.small@environmentpacific.com



Douglas Shire Council
PO Box 724
Mossman QLD 4873.

24th Sept 2023

Email: Jenny Elphinstone
Jenny.Elphinstone@douglas.qld.gov.au

Dear Jenny

RE: Daintree Microgrid Project – request for information, solar farm

As per your email on the 21st September 2023 providing a list of matters on a without prejudice basis to address, in the following we have provided the information in an effort to progress the detail of the Daintree microgrid application accompanying report(s).

Fire and Fire Hazard

1. *Provide a fire management plan for the Daintree Microgrid in the event of fire or fire hazard. In particular, detail the measures in place for the Lithium Iron Phosphate (LiFePO₄) cells, hydrogen and LPG storage components of the generation plant.*

Fire management for the solar farm is an integral part of the design and operation of the solar farm generation site. The fire system will be designed and certified by specialist fire engineers, installed, tested and commissioned to ensure it is an AS 2419 compliant system. Fire management is geared towards the following risk aspects:

Non-chemical/electrical External fire risks: Primarily this relates to the vulnerability of the solar farm to external risks, notably the potential for bush or grass fires to impact on the site. Chemical and electrical fires are considered further in this response. It is noted that the solar farm generation is not within a bushfire hazard overlay as identified in Schedule 2 of the DSC Planning Scheme. Notwithstanding, a number of key aspects have been included in consideration of the non-chemical/electrical risk. Fire management measures for non-chemical/electrical risks include:

- Appropriate clearances between equipment as per relevant standards and industry best practice – including (but limited to) conditions of the *Electricity Safety Act 2002* and Code of Practice 2019 *Construction and operation of solar farms*, National Fire Protection Association Standard 855-2023, and the *Australia New Zealand Industrial Gas Association Standard*.
- Cabled system, with no external (outdoor) live switchgear or exposed busbars which could potentially be a source of ignition/sparks, The overall facility includes separated and specific isolated lightning protection system to the central generation facility (CGF) area, battery energy storage systems (BESS), H₂ processing/storage area, and PV arrays, as required by difference in protection methodology for each component required by relevant standards. Thus the risk of lightning being an ignition sources is significantly reduced by the application of different lightning protection systems for each component type.
- Maintenance of the pasture grass area with a minimum buffer width of 20m between all infrastructure and the edge of the existing regulated vegetation.

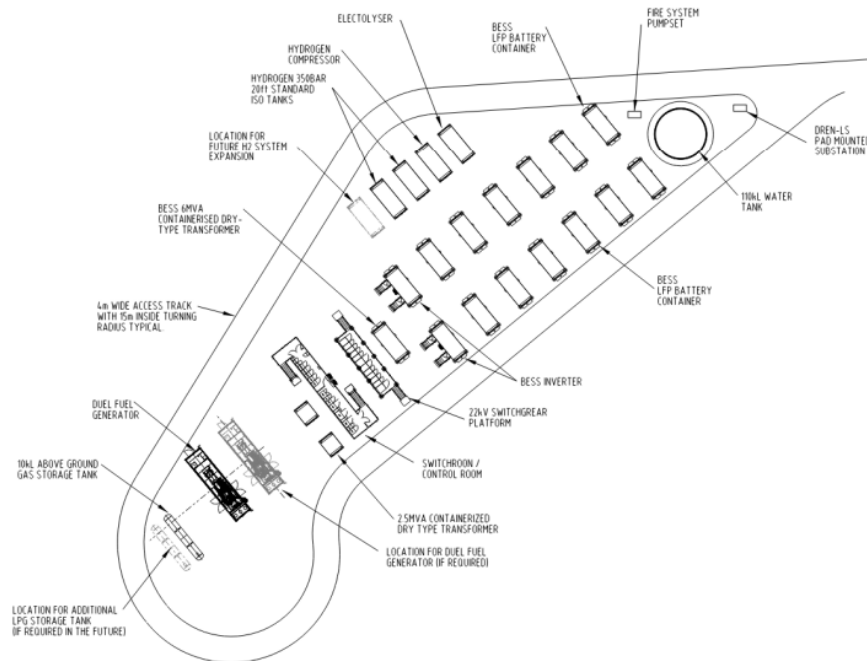
- The use of road and track curtilage that surrounds the generation infrastructure, and provides a further hardened (gravel) surface that both provides an additional firebreak, and also allows emergency vehicle access to all generation components. The road and track curtilage also provides necessary clearance (along with the 20m of maintained cleared pasture as buffer) in accordance with the separation requirements for solar farm infrastructure (such as the BESS and LPG storage) from property boundaries.
- General maintenance of the pasture grass through slashing to reduce grass fuel loads. Allowance has been made in the placing of the PV arrays such that a tractor and slasher can mow between the panels (approximately 2.2m apart).
- The width of the front gates of the security fence (minimum 4000mm as per building codes), and access from Silkwood Road, allow access to the site for all emergency service vehicles, e.g. fire trucks, ambulance, etc.
- Remote surveillance cameras and telemetry provide real-time monitoring of site conditions at the solar farm generation site 24/7.
- There is a N+1 High pressure firefighting skid with a fire system pump set, located by the 110kL tank, which is shown in drawing DRE-ELE-GAR-1001-01, pump sets will be compliant to AS 2419 (dual electric pump set as listed in section 6.4.1 and recommended in order to eliminate reliance on diesel fuel)
- Firefighting facilities for LPG Storage requirements as (Table 13.1 AS/NZS 15986-2014) are to be observed as shown below.

Table 13.1 — Fire protection facilities for cylinder storage

Aggregate capacity L	Requirements
≤1 000	—
Greater than minor storage, outdoors	No specific requirements
Greater than minor storage, indoors	At least one hose reel or one extinguisher.*
>1 000 ≤12 000	At least one hose reel or one extinguisher
>12 000 ≤60 000	At least one hose reel and one extinguisher, or two hose reels
>60 000	At least two extinguishers and two hose reels with one on-site hydrant system, or monitors, or a sprinkler system
<p>* This requirement does not apply to domestic portable cylinders used in a residential situation.</p> <p>NOTE In New Zealand, one fire extinguisher is required where there is more than 50 kg of LP Gas stored or used and two fire extinguishers if the quantity exceeds 200 kg. The fire extinguishers may be substituted by a hydrant system incorporating a 20 mm diameter hose fitted with a spray nozzle.</p>	

- Risk assessment shall be conducted to assess the requirements of the fire hose connection based on the distance to public and protected places (as per section 13.2 and figure 13.1 of AS/NZS1596- 2014)

Figure 8 CGF General Layout (excl Solar Farm)



Layout of the Central Generation Facility Islanded by Accessway

All plant as shown above have clearances at or exceeding requirements of the relevant standards noted.

Battery Energy Storage Cells (Lithium Iron Phosphate (LiFePO₄) cells)

There are multiple requirements for BESS systems under AS/NZS 5139 *Electrical installations-Safety of battery systems for use with power conversion equipment* which outlines safety requirements for installation of renewable energy battery storage equipment. These have been adhered to in the design and layout of the BESS system.

Designers and installers in Queensland have a duty under the *Electrical Safety Act 2002* to ensure their battery storage installs are, as far as is reasonably practicable, electrically safe, this also includes consideration of the thermal risk posed by the batteries. To meet this duty of care, recommendations, standards and conditions under section 4.4.3.3 and sub-section 4.4.3.3.4 of the National Fire Protection Association (NFPA) Standard 855-2023 (Standard for the Installation of Stationary Energy Storage Systems) are being implemented for the DMG Project. For clearances around BESS containers, a minimum of 3.5m (10ft recommended by NFPA 855) is identified in the NFPA standard 855. The Daintree Microgrid facility is using an increased clearance of 4m between container to allow for light vehicle movement, unloading of light goods from LV with enclosure door open. This increased clearance is also in line with recommendations by Queensland Fire and Emergency Services to allow emergency services vehicle access in event of a fire and/or allow individual batteries to 'burn out' without risk to adjoining batteries and the environment.

LiFePO₄ compared to other lithium-ion chemistries have significantly higher thermal stability due to its stable crystal structure, higher thermal onset runaway temperature and significantly significant reduction in oxygen release during a thermal event as such unlike NMC (Nickel Manganese Cobalt)

which can lead to rapid oxygen release needs flooding of cells. Unlike NMC this requirement isn't needed for LiFePO4 therefore gaseous fire suppression is used within each BESS container and is part of the manufacturers OEM (original equipment manufacturer) platform.

There are multiple redundancy layers of controllers which monitor thermal conditions, cell voltage and state of charge and rate of charge/discharge. Collectively referred as the BMS, or Battery Management System, this type of technology oversees the performance of the battery arrays. This layered redundancy system in the BMS is continuously optimizing for safety and is regularly checked by the OEM for warranty and safety compliance. SCADA systems within the units will detect any anomalous behavior and will shut down the effected system, and real-time alerts (text, emergency messages, other digital) will also be issued to fault crews to attend site ASAP and remediate, where the level of alert cannot be controlled externally.

Hydrogen and LPG storage components

Storage of LPG and produced H₂ at the hydrogen facility has defaulted to either an Australian Standard or International/Industry Group (like Australia New Zealand Industrial Gas Association ANZIGA, Gaseous Hydrogen Installations) when a specific standard doesn't exist.

Ensuring clearances between equipment is critical for site compliance to relevant standards, the Daintree Microgrid solar generation farm designed has increased these clearances to provide an additional safety margin and improve maintenance operations as set out in the following.

Clearances between LPG tanks.

Clearances as shown in section 6.2.2 and table 6.1 of AS/NZS1596-2014 have been applied in the generation facility layout. Spacing between tanks will not be less than diameter of the tank. Tanks with diameter of 1.2m were selected, therefore the clearance between tanks shall not be less than 1.2m. For location of tanks at CGF, 1.2m was used

Figure 9 Clearances for LPG Tanks (Table 6.1 of AS/NZS1596-2014)

Table 6.1 — Location of above-ground storage tanks

1	2	3	4
Capacity of the tank kL	Minimum distance to an adjacent LP Gas tank m	Minimum distance from the tank to a public place, or a railway line m	Minimum distance from the tank to a protected place m
≥0.5	Diameter of the largest tank	1.5	1.5
1		2	3
2		4 (3)	6 (4.5)
5		5 (3.5)	8 (5)
8		6 (4)	10 (6)
10		7	11
15		8	14
20		9	15
50		10	17
100		11	20
200		12	25
500		22	45

Clearances from LPG tanks to other objects.

Clearances as per Table 6.1 of AS/NZS1596-2014 were used during concept design. Due to the location of tanks, and 20m clearance between vegetation and the infrastructure, all clearances specified in AS/NZS1596 are met. For clearance, the distance between a tank and ICEG (generator), 7m clearance was used to meet requirements for 10kL tank clearance from public place. However ICEG is not considered as a public place, clearance to public place was used for clarity.

Clearances from H₂ infrastructure to other objects.

Australia Hydrogen standards and regulations are still in their infancy, therefore horizontal safety clearances proposed by ANZIGA in the document Gaseous Hydrogen Installations have been used. In the design. Clearance of 5m from BESS containers was specified (to comply with clearance from electrical equipment). 8m clearance from LPG tanks was exceeded. 8m clearance to site boundary was exceeded due to 20m vegetation clearance. Clearance recommended by ANZIGA are greater compared to clearances listed in table 7.6.2 of NFPA 55. Hydrogen gas at room temperature is very buoyant and when not confined rises at several meters per second, this rapid diffusion in air significantly helps keep the air fuel ratio extremely lean for all but the biggest leaks and as such the gas doesn't follow the terrain to pool and potentially find ignition sources unlike other gases.

Table 1 – Typical minimum horizontal safety distances for hydrogen stations

Typical type of outdoor exposure	Distance in metres of hydrogen from
1. Open flames and other ignition sources (incl. electrical)	5
2. Site boundary and areas where people are likely to congregate such as car parks, canteens, etc.	8
3. Wooden buildings or structures	8
4. Wall opening in offices, workshops, etc.	5
5. Bulk flammable liquids and LPG storage above ground in accordance with national codes, where they exist, for the particular substance. Otherwise	8
6. Bulk flammable liquid and LPG below ground	
6.1 Tank (horizontal distance from shell)	3
6.2 Vent or connections	5
7. Flammable gas cylinder storage, other than hydrogen	5
8. Gaseous oxygen storage (cylinders)	5
9. Liquid oxygen storage (not greater than 125 000 litre tank capacity) ²⁾	8 ¹⁾
10. Non-flammable cryogenic liquid storage, other than oxygen, <u>for example</u> argon, nitrogen ¹⁾	5 ¹⁾
11. Stocks of combustible material, <u>for example</u> timber	8
12. Air compressor, ventilator intakes, etc.	15

¹⁾ Where satisfactory arrangements are made to divert liquid spillage away from the hydrogen system, these distances may be reduced.

²⁾ For tank capacities greater than 125 000 litres see EIGA Document 127. Bulk Liquid Oxygen, Nitrogen and Argon Storage Systems at Production Sites [21].

(Clearances for Hydrogen Installation (Table 1 of ANZIGA Document Gaseous Hydrogen)

Similar to the BESS, monitoring and control for both the H₂ and LPG storages will be automatic, and include additional gas sensors in dedicated equipment such as the electrolyser and dual fuel engine . Any leaks or thermal anomalies noted by the monitoring equipment and SCADA will will operate in a similar way to the BESS where the affected system is shut down and a emergency notifications (text, online, phone etc) to the fault crews is issued to be remedied ASAP. On site portable fire fighting equipment appropriate to the fuel source risk and type will also be maintained on site.

Management of Vegetation

- Detail how regrowth vegetation and existing pasture will be managed in and around the solar generation area.*

There is currently no regrowth vegetation within the entirety of the development footprint. Vegetation on site is dominated by introduced improved grass pasture species which are intended to be retained. This includes the 20m buffer of pasture grass that will be maintained between the infrastructure and the regulated vegetation tree line (as surveyed). The buffer grassed area and all grass pasture areas generally within the solar farm, both inside and outside the security fence, will be maintained by regular slashing. The regular slashing of the pasture is also an important element in fire management for the solar farm, and is also allowed for in the general design and layout of the solar farm. This includes a separation distance between the PV arrays of approximately 2.2m, sufficient to accommodate a tractor and slasher, and between component structures. General ‘housekeeping’ trimming of vegetation around the structures will be undertaken manually e.g., whipper snipper or similar, to ensure any vegetation remains entirely pasture grass. Local contractors would be engaged for the slashing and grass maintenance generally, within the solar farm.

Decommissioning of Plant and Equipment

3. *Provide a management plan for the decommissioning, replacement, and removal of plant and equipment from the site.*

Refurbishment and replacement of components will be a natural consequent of maintenance, repairs, and improvements owing to upgraded technology, that will happen over the initial 30 years of the project, and potentially over the option expansion of another 30 years – 60 years in total. The technology and regulatory requirements, including that for disposal and recycling, for the future time frames noted is unknown. Subsequently, we are suggesting that Council request a Decommissioning Plan as a condition of the Development Permit at such time as the solar farm may reach its end of operational or lease agreement life.

On-site effluent disposal

4. *Provide details of any onsite effluent system to be constructed for workers managing the Daintree Micro Grid solar farm and generation plant.*

It is noted that the Daintree microgrid solar farm day-to-day operations are controlled by telemetry, responding to on-site supervisory control and data acquisition (SCADA) systems which are remotely monitored in real time. There are no workers operating or managing the solar farm on a daily basis. The solar farm will be subject to scheduled inspections of components in accordance with manufacturers specifications by contract workers experienced in the particular component. These personnel would access the solar farm on a 'as required' basis. Given the remote operation and monitoring of the solar farm, no daily operator required on site, and the irregular and short-term visitation nature of scheduled monitoring and maintenance, no permanent on-site ablution facilities are proposed for the solar farm.

In those situations during refurbishment, repair or maintenance requires personnel to be on site for more than the day, then commercially provided and maintained temporary portable ablution facilities may be placed on onsite. These would be placed onsite as and when needed depending on the amount of maintenance activities required. Such facilities are self-contained chemical units which have no off-site discharge, and would be removed like any other temporary works system if such a system was deemed necessary by a contractors own internal O&M requirements.

We note that it may be possible to condition some of the above in the development permit, but should you require any further information on the above, please do not hesitate to contact me as below.

Yours Sincerely

Andrew Small (PhD, BSc, DipBMM)



Director, Principal Scientist
environmentPACIFIC Pty Ltd

DA Form 1 – Development application details

Approved form (version 1.3 effective 28 September 2020) made under section 282 of the Planning Act 2016.

This form **must** be used to make a development application **involving code assessment or impact assessment**, except when applying for development involving only building work.

For a development application involving **building work only**, use *DA Form 2 – Building work details*.

For a development application involving **building work associated with any other type of assessable development (i.e. material change of use, operational work or reconfiguring a lot)**, use this form (*DA Form 1*) and parts 4 to 6 of *DA Form 2 – Building work details*.

Unless stated otherwise, all parts of this form **must** be completed in full and all required supporting information **must** accompany the development application.

One or more additional pages may be attached as a schedule to this development application if there is insufficient space on the form to include all the necessary information.

This form and any other form relevant to the development application must be used to make a development application relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994*, and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*. For the purpose of assessing a development application relating to strategic port land and Brisbane core port land, any reference to a planning scheme is taken to mean a land use plan for the strategic port land, Brisbane port land use plan for Brisbane core port land, or a land use plan for airport land.

Note: All terms used in this form have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the Development Assessment Rules (DA Rules).

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (individual or company full name)	Volt Advisory Group Pty Ltd C/o Dr Andrew Small
Contact name (only applicable for companies)	Richard Schoenemann and Dr Andrew Small
Postal address (P.O. Box or street address)	Level 7, 757 Ann Street
Suburb	Fortitude Valley
State	Queensland
Postcode	4006
Country	Australia
Contact number	0409 494 183
Email address (non-mandatory)	andrew.small@environmentpacific.com
Mobile number (non-mandatory)	0409 494 183
Fax number (non-mandatory)	
Applicant's reference number(s) (if applicable)	

2) Owner's consent	
2.1) Is written consent of the owner required for this development application?	
<input checked="" type="checkbox"/> Yes – the written consent of the owner(s) is attached to this development application	
<input type="checkbox"/> No – proceed to 3)	

PART 2 – LOCATION DETAILS

3) Location of the premises (complete 3.1) or 3.2), and 3.3) as applicable)

Note: Provide details below and attach a site plan for any or all premises part of the development application. For further information, see [DA Forms Guide: Relevant plans](#).

3.1) Street address and lot on plan

- ☒ Street address **AND** lot on plan (all lots must be listed), **or**
☐ Street address **AND** lot on plan for an adjoining or adjacent property of the premises (appropriate for development in water but adjoining or adjacent to land e.g. jetty, pontoon. All lots must be listed).

a)	Unit No.	Street No.	Street Name and Type	Suburb
		174	Buchanan Creek Road	Cow Bay
	Postcode	Lot No.	Plan Type and Number (e.g. RP, SP)	Local Government Area(s)
		5	BK157130	Douglas Shire Council
b)	Unit No.	Street No.	Street Name and Type	Suburb
			Part of the Gazetted Road separating Lot 5 on BK157130	Cow Bay
	Postcode	Lot No.	Plan Type and Number (e.g. RP, SP)	Local Government Area(s)
				Douglas Shire Council

3.2) Coordinates of premises (appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay)

Note: Place each set of coordinates in a separate row.

☒ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) (if applicable)
145.43640°	-16.23248°	<input type="checkbox"/> WGS84 <input type="checkbox"/> GDA94 <input checked="" type="checkbox"/> Other: GDA2020	Douglas Shire Council

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) (if applicable)
		<input type="checkbox"/> 54 <input type="checkbox"/> 55 <input type="checkbox"/> 56	<input type="checkbox"/> WGS84 <input type="checkbox"/> GDA94 <input type="checkbox"/> Other:	

3.3) Additional premises

- ☐ Additional premises are relevant to this development application and the details of these premises have been attached in a schedule to this development application
☒ Not required

4) Identify any of the following that apply to the premises and provide any relevant details

<input checked="" type="checkbox"/> In or adjacent to a water body or watercourse or in or above an aquifer	
Name of water body, watercourse or aquifer:	Buchanan Creek is on the western boundary of the proposed solar farm lot, but the not within the premises (lease area).
<input type="checkbox"/> On strategic port land under the <i>Transport Infrastructure Act 1994</i>	
Lot on plan description of strategic port land:	
Name of port authority for the lot:	
<input type="checkbox"/> In a tidal area	
Name of local government for the tidal area (if applicable):	
Name of port authority for tidal area (if applicable):	

<input type="checkbox"/> On airport land under the <i>Airport Assets (Restructuring and Disposal) Act 2008</i>	
Name of airport:	
<input type="checkbox"/> Listed on the Environmental Management Register (EMR) under the <i>Environmental Protection Act 1994</i>	
EMR site identification:	No, a search of the EMR and CLR has been undertaken on the premises (refer attached)
<input type="checkbox"/> Listed on the Contaminated Land Register (CLR) under the <i>Environmental Protection Act 1994</i>	
CLR site identification:	No, a search of the EMR and CLR has been undertaken on the premises (refer attached)

5) Are there any existing easements over the premises?

Note: Easement uses vary throughout Queensland and are to be identified correctly and accurately. For further information on easements and how they may affect the proposed development, see [DA Forms Guide](#).

- ☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application
- ☒ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

a) What is the type of development? *(tick only one box)*

- ☒ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

- ☒ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

- ☐ Code assessment ☒ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots):*

1. Material Change of Use for a Renewable Energy Facility and Battery Storage Facility (8 MW electrical generation solar station and battery storage facility);

e) Relevant plans

Note: Relevant plans are required to be submitted for all aspects of this development application. For further information, see [DA Forms guide: Relevant plans](#).

- ☒ Relevant plans of the proposed development are attached to the development application

6.2) Provide details about the second development aspect

a) What is the type of development? *(tick only one box)*

- ☒ Material change of use ☐ Reconfiguring a lot ☐ Operational work ☐ Building work

b) What is the approval type? *(tick only one box)*

- ☒ Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

- ☒ Code assessment ☐ Impact assessment *(requires public notification)*

d) Provide a brief description of the proposal *(e.g. 6 unit apartment building defined as multi-unit dwelling, reconfiguration of 1 lot into 3 lots):*

2. Material Change of Use for a Utility Installation (Hydrogen production, hydrogen power generation conversion and Utility installation to distribute generated power);

e) Relevant plans

Note: Relevant plans are required to be submitted for all aspects of this development application. For further information, see [DA Forms Guide: Relevant plans](#).

- ☒ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development

- ☒ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application
- ☐ Not required

Section 2 – Further development details**7) Does the proposed development application involve any of the following?**

Material change of use	<input checked="" type="checkbox"/> Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	<input checked="" type="checkbox"/> Yes – complete division 2
Operational work	<input checked="" type="checkbox"/> Yes – complete division 3
Building work	<input type="checkbox"/> Yes – complete <i>DA Form 2 – Building work details</i>

Division 1 – Material change of use

Note: This division is only required to be completed if any part of the development application involves a material change of use assessable against a local planning instrument.

8.1) Describe the proposed material change of use

Provide a general description of the proposed use	Provide the planning scheme definition (include each definition in a new row)	Number of dwelling units (if applicable)	Gross floor area (m ²) (if applicable)
Construction and operation of an 8MW solar farm and battery storage facility as a renewable energy facility	Renewable energy facility and battery storage facility	N/A	N/A
Hydrogen production, hydrogen power generation conversion and Utility installation to distribute generated power);	Utility Installation	N/A	N/A

8.2) Does the proposed use involve the use of existing buildings on the premises?

☐ Yes

☒ No

Division 2 – Reconfiguring a lot

Note: This division is only required to be completed if any part of the development application involves reconfiguring a lot.

9.1) What is the total number of existing lots making up the premises?

One (1)

9.2) What is the nature of the lot reconfiguration? (tick all applicable boxes)

<input type="checkbox"/> Subdivision (complete 10))	<input checked="" type="checkbox"/> Dividing land into parts by agreement (complete 11))
<input type="checkbox"/> Boundary realignment (complete 12))	<input type="checkbox"/> Creating or changing an easement giving access to a lot from a constructed road (complete 13))

10) Subdivision**10.1) For this development, how many lots are being created and what is the intended use of those lots:**

Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
Number of lots created				

10.2) Will the subdivision be staged?

☐ Yes – provide additional details below

☐ No

How many stages will the works include?	
-----------------------------------------	--

What stage(s) will this development application apply to?				
11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify: Renewable energy infrastructure
Number of parts created				Two (Lease Area B and Lease Area C)
12) Boundary realignment				
12.1) What are the current and proposed areas for each lot comprising the premises?				
Current lot		Proposed lot		
Lot on plan description	Area (m ²)	Lot on plan description	Area (m ²)	
12.2) What is the reason for the boundary realignment?				

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? (attach schedule if there are more than two easements)				
Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? (e.g. pedestrian access)	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

Note: This division is only required to be completed if any part of the development application involves operational work.

14.1) What is the nature of the operational work?	
<input checked="" type="checkbox"/> Road work <input checked="" type="checkbox"/> Drainage work <input type="checkbox"/> Landscaping <input type="checkbox"/> Other – please specify:	<input type="checkbox"/> Stormwater <input checked="" type="checkbox"/> Earthworks <input type="checkbox"/> Signage <input type="checkbox"/> Water infrastructure <input type="checkbox"/> Sewage infrastructure <input type="checkbox"/> Clearing vegetation Operational Work being excavation / filling over 25m ³ ; and Operational Work being work within a local government road (installation of underground cables and construction of road access driveways and drainage);
14.2) Is the operational work necessary to facilitate the creation of new lots? (e.g. subdivision)	
<input type="checkbox"/> Yes – specify number of new lots:	
<input checked="" type="checkbox"/> No	
14.3) What is the monetary value of the proposed operational work? (include GST, materials and labour)	
Operational works – solar farm generation site: approximately \$ 9,250,000.00.	

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application
Douglas Shire Council
16) Has the local government agreed to apply a superseded planning scheme for this development application?
<input type="checkbox"/> Yes – a copy of the decision notice is attached to this development application

- ☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
- ☒ No

PART 5 – REFERRAL DETAILS

17) Does this development application include any aspects that have any referral requirements?

Note: A development application will require referral if prescribed by the Planning Regulation 2017.

- ☐ No, there are no referral requirements relevant to any development aspects identified in this development application – proceed to Part 6

Matters requiring referral to the **Chief Executive of the Planning Act 2016**:

- ☐ Clearing native vegetation
- ☐ Contaminated land (*unexploded ordnance*)
- ☐ Environmentally relevant activities (ERA) (*only if the ERA has not been devolved to a local government*)
- ☐ Fisheries – aquaculture
- ☐ Fisheries – declared fish habitat area
- ☐ Fisheries – marine plants
- ☐ Fisheries – waterway barrier works
- ☐ Hazardous chemical facilities
- ☐ Heritage places – Queensland heritage place (*on or near a Queensland heritage place*)
- ☐ Infrastructure-related referrals – designated premises
- ☐ Infrastructure-related referrals – state transport infrastructure
- ☐ Infrastructure-related referrals – State transport corridor and future State transport corridor
- ☐ Infrastructure-related referrals – State-controlled transport tunnels and future state-controlled transport tunnels
- ☐ Infrastructure-related referrals – near a state-controlled road intersection
- ☐ Koala habitat in SEQ region – interfering with koala habitat in koala habitat areas outside koala priority areas
- ☐ Koala habitat in SEQ region – key resource areas
- ☐ Ports – Brisbane core port land – near a State transport corridor or future State transport corridor
- ☐ Ports – Brisbane core port land – environmentally relevant activity (ERA)
- ☐ Ports – Brisbane core port land – tidal works or work in a coastal management district
- ☐ Ports – Brisbane core port land – hazardous chemical facility
- ☐ Ports – Brisbane core port land – taking or interfering with water
- ☐ Ports – Brisbane core port land – referable dams
- ☐ Ports – Brisbane core port land – fisheries
- ☐ Ports – Land within Port of Brisbane's port limits (*below high-water mark*)
- ☐ SEQ development area
- ☐ SEQ regional landscape and rural production area or SEQ rural living area – tourist activity or sport and recreation activity
- ☐ SEQ regional landscape and rural production area or SEQ rural living area – community activity
- ☐ SEQ regional landscape and rural production area or SEQ rural living area – indoor recreation
- ☐ SEQ regional landscape and rural production area or SEQ rural living area – urban activity
- ☐ SEQ regional landscape and rural production area or SEQ rural living area – combined use
- ☐ Tidal works or works in a coastal management district
- ☐ Reconfiguring a lot in a coastal management district or for a canal
- ☐ Erosion prone area in a coastal management district
- ☐ Urban design
- ☐ Water-related development – taking or interfering with water
- ☐ Water-related development – removing quarry material (*from a watercourse or lake*)
- ☐ Water-related development – referable dams
- ☐ Water-related development – levees (*category 3 levees only*)
- ☐ Wetland protection area

Matters requiring referral to the **local government**:

☐ Airport land

☐ Environmentally relevant activities (ERA) *(only if the ERA has been devolved to local government)*

☐ Heritage places – Local heritage places

Matters requiring referral to the **Chief Executive of the distribution entity or transmission entity**:

☐ Infrastructure-related referrals – Electricity infrastructure

Matters requiring referral to:

- The **Chief Executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

☐ Infrastructure-related referrals – Oil and gas infrastructure

Matters requiring referral to the **Brisbane City Council**:

☐ Ports – Brisbane core port land

Matters requiring referral to the **Minister responsible for administering the Transport Infrastructure Act 1994**:

☐ Ports – Brisbane core port land *(where inconsistent with the Brisbane port LUP for transport reasons)*

☐ Ports – Strategic port land

Matters requiring referral to the **relevant port operator**, if applicant is not port operator:

☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*

Matters requiring referral to the **Chief Executive of the relevant port authority**:

☐ Ports – Land within limits of another port *(below high-water mark)*

Matters requiring referral to the **Gold Coast Waterways Authority**:

☐ Tidal works or work in a coastal management district *(in Gold Coast waters)*

Matters requiring referral to the **Queensland Fire and Emergency Service**:

☐ Tidal works or work in a coastal management district *(involving a marina (more than six vessel berths))*

18) Has any referral agency provided a referral response for this development application?

☒ Yes – referral response(s) received and listed below are attached to this development application

☐ No

Referral requirement	Referral agency	Date of referral response
Prelodgment response identified no referrals were identified by SARA for solar farm component.	SARA	2208-30357 SPL 7 th November 2022

Identify and describe any changes made to the proposed development application that was the subject of the referral response and this development application, or include details in a schedule to this development application *(if applicable)*.

No changes made as a result of referral responses.

PART 6 – INFORMATION REQUEST

19) Information request under Part 3 of the DA Rules

☒ I agree to receive an information request if determined necessary for this development application

☐ I do not agree to accept an information request for this development application

Note: By not agreeing to accept an information request I, the applicant, acknowledge:

- that this development application will be assessed and decided based on the information provided when making this development application and the assessment manager and any referral agencies relevant to the development application are not obligated under the DA Rules to accept any additional information provided by the applicant for the development application unless agreed to by the relevant parties
- Part 3 of the DA Rules will still apply if the application is an application listed under section 11.3 of the DA Rules.

Further advice about information requests is contained in the [DA Forms Guide](#).

PART 7 – FURTHER DETAILS

20) Are there any associated development applications or current approvals? (e.g. a preliminary approval)

- ☐ Yes – provide details below or include details in a schedule to this development application
☒ No

List of approval/development application references	Reference number	Date	Assessment manager
<input type="checkbox"/> Approval <input type="checkbox"/> Development application			
<input type="checkbox"/> Approval <input type="checkbox"/> Development application			

21) Has the portable long service leave levy been paid? (only applicable to development applications involving building work or operational work)

- ☐ Yes – a copy of the receipted QLeave form is attached to this development application
☐ No – I, the applicant will provide evidence that the portable long service leave levy has been paid before the assessment manager decides the development application. I acknowledge that the assessment manager may give a development approval only if I provide evidence that the portable long service leave levy has been paid
☒ Not applicable (e.g. building and construction work is less than \$150,000 excluding GST)

Amount paid	Date paid (dd/mm/yy)	QLeave levy number (A, B or E)
\$		

22) Is this development application in response to a show cause notice or required as a result of an enforcement notice?

- ☐ Yes – show cause or enforcement notice is attached
☒ No

23) Further legislative requirements

Environmentally relevant activities

23.1) Is this development application also taken to be an application for an environmental authority for an **Environmentally Relevant Activity (ERA)** under section 115 of the *Environmental Protection Act 1994*?

- ☐ Yes – the required attachment (form ESR/2015/1791) for an application for an environmental authority accompanies this development application, and details are provided in the table below
☒ No

Note: Application for an environmental authority can be found by searching "ESR/2015/1791" as a search term at www.qld.gov.au. An ERA requires an environmental authority to operate. See www.business.qld.gov.au for further information.

Proposed ERA number:		Proposed ERA threshold:	
Proposed ERA name:			

- ☐ Multiple ERAs are applicable to this development application and the details have been attached in a schedule to this development application.

Hazardous chemical facilities

23.2) Is this development application for a **hazardous chemical facility**?

- ☐ Yes – Form 69: Notification of a facility exceeding 10% of schedule 15 threshold is attached to this development application
☒ No

Note: See www.business.qld.gov.au for further information about hazardous chemical notifications.

Clearing native vegetation

23.3) Does this development application involve **clearing native vegetation** that requires written confirmation that the chief executive of the *Vegetation Management Act 1999* is satisfied the clearing is for a relevant purpose under section 22A of the *Vegetation Management Act 1999*?

☐ Yes – this development application includes written confirmation from the chief executive of the *Vegetation Management Act 1999* (s22A determination)

☒ No

Note: 1. Where a development application for operational work or material change of use requires a s22A determination and this is not included, the development application is prohibited development.
2. See <https://www.qld.gov.au/environment/land/vegetation/applying> for further information on how to obtain a s22A determination.

Environmental offsets

23.4) Is this development application taken to be a prescribed activity that may have a significant residual impact on a **prescribed environmental matter** under the *Environmental Offsets Act 2014*?

☐ Yes – I acknowledge that an environmental offset must be provided for any prescribed activity assessed as having a significant residual impact on a prescribed environmental matter

☒ No

Note: The environmental offset section of the Queensland Government's website can be accessed at www.qld.gov.au for further information on environmental offsets.

Koala habitat in SEQ Region

23.5) Does this development application involve a material change of use, reconfiguring a lot or operational work which is assessable development under Schedule 10, Part 10 of the Planning Regulation 2017?

☐ Yes – the development application involves premises in the koala habitat area in the koala priority area

☐ Yes – the development application involves premises in the koala habitat area outside the koala priority area

☒ No

Note: If a koala habitat area determination has been obtained for this premises and is current over the land, it should be provided as part of this development application. See koala habitat area guidance materials at www.des.qld.gov.au for further information.

Water resources

23.6) Does this development application involve **taking or interfering with underground water through an artesian or subartesian bore, taking or interfering with water in a watercourse, lake or spring, or taking overland flow water under the Water Act 2000**?

☐ Yes – the relevant template is completed and attached to this development application and I acknowledge that a relevant authorisation or licence under the *Water Act 2000* may be required prior to commencing development

☒ No

Note: Contact the Department of Natural Resources, Mines and Energy at www.dnrme.qld.gov.au for further information.

DA templates are available from <https://planning.dsdmip.qld.gov.au/>. If the development application involves:

- Taking or interfering with underground water through an artesian or subartesian bore: complete DA Form 1 Template 1
- Taking or interfering with water in a watercourse, lake or spring: complete DA Form 1 Template 2
- Taking overland flow water: complete DA Form 1 Template 3.

Waterway barrier works

23.7) Does this application involve **waterway barrier works**?

☐ Yes – the relevant template is completed and attached to this development application

☒ No

DA templates are available from <https://planning.dsdmip.qld.gov.au/>. For a development application involving waterway barrier works, complete DA Form 1 Template 4.

Marine activities

23.8) Does this development application involve **aquaculture, works within a declared fish habitat area or removal, disturbance or destruction of marine plants**?

☐ Yes – an associated resource allocation authority is attached to this development application, if required under the *Fisheries Act 1994*

☒ No

Note: See guidance materials at www.daf.qld.gov.au for further information.

Quarry materials from a watercourse or lake

23.9) Does this development application involve the **removal of quarry materials from a watercourse or lake** under the *Water Act 2000*?

- ☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development
☒ No

Note: Contact the Department of Natural Resources, Mines and Energy at www.dnrme.qld.gov.au and www.business.qld.gov.au for further information.

Quarry materials from land under tidal waters

23.10) Does this development application involve the **removal of quarry materials from land under tidal water** under the *Coastal Protection and Management Act 1995*?

- ☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development
☒ No

Note: Contact the Department of Environment and Science at www.des.qld.gov.au for further information.

Referable dams

23.11) Does this development application involve a **referable dam** required to be failure impact assessed under section 343 of the *Water Supply (Safety and Reliability) Act 2008* (the Water Supply Act)?

- ☐ Yes – the 'Notice Accepting a Failure Impact Assessment' from the chief executive administering the Water Supply Act is attached to this development application
☒ No

Note: See guidance materials at www.dnrme.qld.gov.au for further information.

Tidal work or development within a coastal management district

23.12) Does this development application involve **tidal work or development in a coastal management district**?

- ☐ Yes – the following is included with this development application:
- ☐ Evidence the proposal meets the code for assessable development that is prescribed tidal work (*only required if application involves prescribed tidal work*)
 - ☐ A certificate of title
- ☒ No

Note: See guidance materials at www.des.qld.gov.au for further information.

Queensland and local heritage places

23.13) Does this development application propose development on or adjoining a place entered in the **Queensland heritage register** or on a place entered in a local government's **Local Heritage Register**?

- ☐ Yes – details of the heritage place are provided in the table below
☒ No

Note: See guidance materials at www.des.qld.gov.au for information requirements regarding development of Queensland heritage places.

Name of the heritage place:		Place ID:	
-----------------------------	--	-----------	--

Brothels

23.14) Does this development application involve a **material change of use for a brothel**?

- ☐ Yes – this development application demonstrates how the proposal meets the code for a development application for a brothel under Schedule 3 of the *Prostitution Regulation 2014*
☒ No

Decision under section 62 of the Transport Infrastructure Act 1994

23.15) Does this development application involve new or changed access to a state-controlled road?

- ☐ Yes – this application will be taken to be an application for a decision under section 62 of the *Transport Infrastructure Act 1994* (subject to the conditions in section 75 of the *Transport Infrastructure Act 1994* being satisfied)
☒ No

Walkable neighbourhoods assessment benchmarks under Schedule 12A of the Planning Regulation

23.16) Does this development application involve reconfiguring a lot into 2 or more lots in certain residential zones (except rural residential zones), where at least one road is created or extended?

- ☐ Yes – Schedule 12A is applicable to the development application and the assessment benchmarks contained in schedule 12A have been considered
- ☒ No

Note: See guidance materials at www.planning.dsdmip.qld.gov.au for further information.

PART 8 – CHECKLIST AND APPLICANT DECLARATION

24) Development application checklist

I have identified the assessment manager in question 15 and all relevant referral requirement(s) in question 17

☒ Yes

Note: See the *Planning Regulation 2017* for referral requirements

If building work is associated with the proposed development, Parts 4 to 6 of [DA Form 2 – Building work details](#) have been completed and attached to this development application

☐ Yes

☒ Not applicable

Supporting information addressing any applicable assessment benchmarks is with the development application

Note: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see [DA Forms Guide: Planning Report Template](#).

☒ Yes

Relevant plans of the development are attached to this development application

Note: Relevant plans are required to be submitted for all aspects of this development application. For further information, see [DA Forms Guide: Relevant plans](#).

☒ Yes

The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued (see 21)

☐ Yes

☒ Not applicable

25) Applicant declaration

☒ By making this development application, I declare that all information in this development application is true and correct

☒ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the assessment manager and any referral agency for the development application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001*

Note: It is unlawful to intentionally provide false or misleading information.

Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application. All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website.

Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, *Planning Regulation 2017* and the DA Rules except where:

- such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the *Planning Regulation 2017*, and the access rules made under the *Planning Act 2016* and *Planning Regulation 2017*; or
- required by other legislation (including the *Right to Information Act 2009*); or
- otherwise required by law.

This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002*.

PART 9 – FOR COMPLETION OF THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

Date received: Reference number(s):

Notification of engagement of alternative assessment manager

Prescribed assessment manager	
Name of chosen assessment manager	
Date chosen assessment manager engaged	
Contact number of chosen assessment manager	
Relevant licence number(s) of chosen assessment manager	

QLeave notification and payment

Note: For completion by assessment manager if applicable

Description of the work	
QLeave project number	
Amount paid (\$)	Date paid (dd/mm/yy)
Date receipted form sighted by assessment manager	
Name of officer who sighted the form	



Volt Advisory

Development Permit Application

- Material Change of Use
- Reconfiguration of a Lot
- Operational Works

Lot 5 BK157130

Planning Report

Daintree Microgrid Project

October 2023



environmentPACIFIC

The services provided by Environment Pacific Pty Ltd for Volt Advisory Group ('VA') are limited to those identified in this report. This report may only be used and relied on by VA for the purpose agreed between Environment Pacific and VA. Environment Pacific also excludes implied warranties and conditions, to the extent legally possible. The opinions, conclusions and recommendations are based on conditions encountered and information reviewed at the date of this report. Environment Pacific has no responsibility or obligation to update this report to account for events or changes occurring since this time.

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Daintree Microgrid –Planning Report

Document Status

Rev	Author	Signature	Reviewer	Signature	Date
A	A Small	AS	K Keane	KK	22/07/2023
B	A Small	AS	K Keane	KK	21/08/2023
C	A Small	AS	McPeake Planning	External	28/09/2023

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Appendix L — Tables of Code & Overlay Assessments

Executive Summary

Volt Advisory Group Pty Ltd (VA - the 'Proponent') is proposing the construction and operation of an 8MW solar generation renewable energy facility in Cow Bay, and associated electrical distribution network between (and including) Cow Bay to Cape Tribulation. Collectively both aspects are referred to as the Daintree Microgrid project (DMG project).

Subsequently, VA are seeking statutory development approval from Douglas Shire Council (DSC) for a lease exceeding 10 years over a portion of Lot 5 on BK157130, Buchanan Creek Road to construct and operate the solar farm generation site.

The solar farm generation site is within a lease plan area of 8.6 ha, and the development footprint requires no native vegetation clearing. The generation equipment is a solar / hydrogen hybrid plant whereby solar energy is used to power electrolysis splitting water into oxygen and hydrogen gas. The hydrogen that is produced is then pressurised and stored. To create electricity, the hydrogen gas is passed through a fuel cell and combined with oxygen.

The reaction between the two gases produces electricity which is stored in a battery energy storage system (BESS - which is then supplied to the grid) and water vapour. The water vapour is reused at a rate of approximately 50% and the balance evaporates into the atmosphere. Approximately 40% of the solar energy generated will feed directly into the electricity network, and 60% used for the electrolysis process.

All aspects of the DMG are located within the Conservation Zone, and the solar farm generation site is located within Precinct 5 *Low Impact Rural Production and Tourism Enterprise* of the Cape Tribulation and Daintree Coast Local Plan of the *Douglas Shire Council Planning Scheme 2018* (Planning Scheme).

The proposed uses on the site are: solar farm generation is defined as a *Renewable Energy Facility*, the hydrogen hybrid plant and hydrogen storage is defined as a *Utility Installation* under the Planning Scheme. The battery energy storage system is defined as *Battery Storage Facility* as per Schedule 24 of the Planning Regulation 2017. All proposed uses are not identified as defined as an 'inconsistent use' within the Conservation Zone. Subsequently this Development Application (DA) from VA is seeking approval from DSC for the following:

Development Permit

- Material Change of Use (MCU) –Renewable Energy Facility (8 MW electrical generation solar station) and *Battery Storage Facility* (battery energy storage system) (battery storage).
- Material Change of Use (MCU) - Material Change of Use for a Utility Installation (hydrogen production, hydrogen power generation conversion and Utility installation to distribute generated power).
- Operational Works being excavation and fill of greater than 25m³.
- Operational Work being work within a local government road (installation of underground cables and construction of road access driveways, drainage, fencing).
- Reconfiguration of a lot creating two lots by lease agreement for a period of one then then (10 years). and subdivision – Term Lease greater than 10 years.

The DMG project is not inconsistent with the desired outcomes and purpose of the Conservation Zone. The Douglas Shire Planning Scheme Part 3, Strategic Framework, s3.9.2.1 part (4) identifies Specific outcomes, relevant to the DMG project.

Notably:

- (4) *The paradox of polluting fuel-based power generation and the pristine World Heritage setting of the Daintree rainforests, north of the Daintree River is acknowledged. Proposals to extend electricity supply to properties north of the Daintree River take into account the sensitive environmental characteristics of the area, the fact that it is an area that is largely of world heritage significance and the climatic risks impacting the area such as cyclones and other weather events, all of which will influence decisions about the nature and scale of the electricity supply infrastructure which may be provided.,*

The DMG project has been designed such that it:

- a) provides a renewable energy option to existing hydrocarbon based electrical systems in the DMG project area, potentially removing between 8,000 and 10,000 metric tonnes per year of carbon emissions (depending on final customer uptake);
- b) does not require the removal/disturbance of any native vegetation community or fauna habitat as the solar farm generation site is located in an existing cleared area (cattle grazing pasture) and the cable distribution network will be underground either beside or within formed road surfaces.
- c) visual amenity and the Daintree 'experience' is not compromised in any way. The solar farm generation site is not visible from any private or public vantage point, except for traffic immediately beside the facility on Silkwood Road, a minor rural road. It is proposed that the existing vegetation on the road reserve will be thickened through additional planting to improve the screening effect.
- d) is resilience to the natural climatic risks of the Daintree, including exposure to cyclonic events, flooding, and demonstrates incorporation of climate change adaptation technologies underwritten by the CSIRO HyResource division (as partners) ¹
- e) Supports the Eastern Kuku Yalanji 'Return to Country' aspirations.

In consideration of the above in supporting the Douglas Shire Council's Strategic Planning Framework, VA believes that the DMG project can be constructed, operated and maintained to comply with all applicable assessment benchmarks under the Planning Scheme and all other relevant State legislation.

Subsequently VA are submitting this DA for approval to DSC, subject to any reasonable and relevant conditions as may be imposed.

The operational works within the local government road network are not part of this Development Application, and will be addressed through a Prescribed Activities Permit application with Douglas Shire Council.

¹ <https://research.csiro.au/hyresource/daintree-microgrid-project/>

1. Summary

1.1 Development application details

Development application details as below.

Table 1 Development Application Summary

Information	Details
Applicant	Volt Advisory Group Pty Ltd C/Environment Pacific Pty Ltd PO Box 724 Edge Hill QLD 4870
Registered landowner	Solar farm: Lot 5 BK157130, Dennis Verri, 174 Buchanan Creek Road, Cow Bay, QLD 4873
Proposed development:	<ul style="list-style-type: none"> An 8MW solar farm to be located in Cow Bay comprising solar array (photovoltaic panels PV), electrolysis unit, battery energy storage system, fuel cells, water tank, switchgear, emergency backup generator and fuel storage (LPG/H₂)
Assessment manager:	Douglas Shire Council
Type of approval sought:	Development Permits for: <ul style="list-style-type: none"> Material Change of Use for solar farm battery storage facility, and utility installation Reconfiguration of a Lot from one to two lots by lease agreement Operational works <ul style="list-style-type: none"> solar farm, excavation and filling greater than 25m³ internal road reserve, drainage and access works. Operational Work being work within a local government road.
Level of assessment	Impact assessable – MCU (solar farm and battery energy storage system (BESS), RoL (subdivision by lease agreement). Code assessable – MCU (Utility Installation) and Operational works.
Site address:	174 Buchanan Creek Road, Cow Bay, QLD 4873 (frontage to Silkwood Road)
Real property description:	Lot 5 BK157130,
Site area:	Solar farm generation site: 8.619 ha Lot 5 BK157130 comprising: <ul style="list-style-type: none"> Generation equipment – 862 m² Ancillary equipment (PV arrays) – 5.9ha Buffer areas (non developed) and internal tracks – 2.63 ha
Public notification	Required - 15 business days

1.2 Planning instrument details

Applicable planning instruments relevant to the DMG project are presented below.

Table 2 Planning Instruments

Instrument	Detail and Relevancy
State planning policy:	State Planning Policy (2017). Solar farm generation site is not subject to any State interests. Refer Appendix A, SARA prelodgment response 2208-30357 SPL
Regional plan: Designation:	Far North Queensland Regional Plan 2009–2031. Not applicable. Lot 5 on BK157130 is within a Regional Landscape and Rural Protection Area that is not subject to a regional landuse category regulated under the Plan.
Planning scheme:	Douglas Shire Council Planning Scheme (commenced 2nd January 2018)
Applicable preliminary approval:	Not applicable
Strategic framework:	Strategic Framework Part 3 of the DSC Planning Scheme 2018 applicable Themes: (b) Environment and landscape values; (f) Infrastructure and transport. Lot 5 BK157130 is within 'Rural Area' - Strategic Framework Map Sheet 1 - SFM-001
Zone:	Conservation Zone
Local plan:	Cape Tribulation and Daintree Coast local plan area LPM-002-Diwan – Cow Bay Local Plan Lot 5 BK157130 is within Precinct 5 – Low Impact Rural Production and Tourism Enterprise
Level of assessment:	MCU (Solar Farm and BESS) and RoL - Impact assessable MCU (Utility Installation) and Operational works – code assessable
Applicable overlays:	Conservation Zone Local Plan – Diwan – Cow Bay, Precinct 5 Acid sulphate soils Flood and storm tide inundation Hillslopes Landscape values Natural areas Potential landslide hazards Transport Road Hierarchy
Applicable codes:	All of Douglas Shire Planning Scheme

1.3 Referral agencies

The Daintree Microgrid Project (DMG project) has been referred in its entirety to the State Assessment Referral Agency (SARA) 2208-30357 SPL – refer Appendix A.

The SARA response has indicated that there are no State interests triggered for the DMG project within Lot 5 BK157130.

2. Site Details

2.1 Location

2.1.1 Regional Context

The entire DMG project area comprises the area between (and including) Cow Bay to Cape Tribulation, far north Queensland, within the Douglas Shire. The DMG project area begins approximately 40km by road north of the town of Mossman, and 120km by road north of the regional centre of Cairns.

The approximate 8.6ha solar farm generation site is centred on:

GDA2020 (lat/long)

- Latitude: -16 23202°
- Longitude: 145.43626 °

Figure 1 Regional setting of solar farm (generation site)



2.1.2 Electrical distribution locations

For information only: Assessment of the electrical distribution network is not part of this Development Application.

Electrical distribution will be via underground cabling in conduits with approximately 68.9km of cables within 56km of road reserve (there will be doubling up of cables in some trenches/conduits) with 27 transformer kiosks and junction boxes/switchgear to be installed. Distribution will extend to all 32 road reserves between and including Cow Bay to Cape Tribulation.

2.1.3 Local Context

A lease option of approximately 8.6ha have been taken out over a portion of Lot 5 BK157130, 174 Buchanan Creek Road, Cow Bay, 4873. Refer Appendix B for lease plan survey details. All of the proposed solar farm generation equipment and photovoltaic (PV) arrays are to be located within the lease. The lease is located on the south-east corner of 5 BK157130 and will be accessed from Silkwood Road (gazetted minor rural road). The surveyed road reserve within 5 BK157130 is an unformed road over which Owners Consent from the Department of Resources has been obtained (refer Appendix C)

Figure 2 Location of solar farm (generation site)



2.2 Existing land use

The solar farm generation site is surrounded by the following:

- North: existing natural forested area in conservation tenure.
- West: balance of lot 5 BK157130, existing grazing property, separated from site by Buchanan Creek
- South; balance of lot 5 BK157130, existing grazing property, separated by Buchanan Creek.
- East: Silkwood Road, separating rural residential properties on eastern side of road from proposed solar farm site.

Land use within the solar farm generation site is rural production, consisting entirely of cattle grazing on improved pastures.

Land use adjacent the road reserve network includes a mix of rural residential, commercial, horticultural and protected area estates.

2.3 Existing infrastructure and services

There are no permanent structures within the lease area for the solar farm generation site. The property is fenced on all sites to contain cattle, with a single swing gate on the road frontage (eastern side) with Silkwood Road. There are no water or sewer services along Silkwood Road. There is a buried Telstra communication cable on the eastern side of the Silkwood Road reserve which will not be disturbed.

2.4 Frontage and access

Portion C of the lease plan (7.181 ha) has a frontage to Silkwood Road of 397.6m, with a frontage of 508.08m to an unformed road reserve on the western boundary of this lease.

Portion B of the lease plan (1.438 ha) has a 306m frontage on the eastern boundary of the unformed road reserve but does not front Silkwood Road.

Refer to Appendix B for surveyed lease boundaries.

Proposed access to the solar farm generation site is to be from Silkwood Road. The proposed access is shown in Appendix C, general layout drawing DRE-ELE-GAR-1001, Appendix E, Plans of Development..

2.5 Topography and views

2.5.1 Site Aspect

The solar farm generation site is on the northern footslopes of the Alexandra Range, on mild to very mild slopes ranging from a maximum elevation of 49m ASL (above sea level) in the far south-east of site, grading to 23m ASL on the northern boundary of the site. Maximum slope is 22% in the south-east of the site, with the average approximately 6 % for the majority of the site, grading south to north over 398m. See Figure 3, and Appendix E, general layout drawing DRE-ELE-GAR-1001 showing contour intervals.

2.5.2 Views

A formal near-field and far-field viewshed analysis has been undertaken for the DMG Project. Refer Visual Amenity Assessment (Appendix I). The maximum height of the solar panels above natural surface level is 2.6m, with the containerised equipment for electrolyzers/battery/transformers etc, not

exceeding 3.9m on 900mm footings. The tallest building is the control room/switch room, being 6.16m above natural surface level (see drawings DRE-CIV-GAR-1017 in Appendix E). Two telemetry/SCADA masts will extend to 7.5m above the ground as part of the electrolyser unit (DRE-CIV-GAR-12).

The solar farm is located at its closest point approximately 440m from Buchanan Creek Road, the main road into Cow Bay. No aspect of the solar farm will be discernible from Buchanan Creek Road owing to the dense vegetation buffer afforded by Buchanan Creek. Height surveys of the vegetation along Buchanan Creek has been undertaken, with average treeline height being approximately 18m, with occasional emergents to 22m.

With respect to residential locations within a 5km proximity, the highest residential areas are located at the top of White Beech and Red Gum Road (Cow Bay) approximately 2.8km from the solar farm, and Mahogany Road (Diwan) approximately 5km from the solar farm. The solar array (maximum of 2.6m height), and single storey containerised supporting infrastructure will not be visible from any of these locations and subsequently there will not be any properties subject to glint and glare from the solar arrays.

Operationally, the solar farm itself will not be visible from residences on the eastern side of Silkwood Road owing to the retained vegetation on these properties, however it will be visible to traffic accessing these properties on Silkwood Road. This near-field viewshed, in the absence of any mitigation measures, may reduce the Daintree experience for visitors to commercial premises (B & B accommodation) at the southern end of Silkwood Road. The DMG project has engaged a commercial revegetation/rehabilitation company who will substantially 'thicken' the vegetation along the Silkwood Road reserve to further mitigate the potential for near-field viewshed impacts.



Overview of solar farm looking from south-east corner on Silkwood Road north-west over entire site.

2.6 Existing vegetation

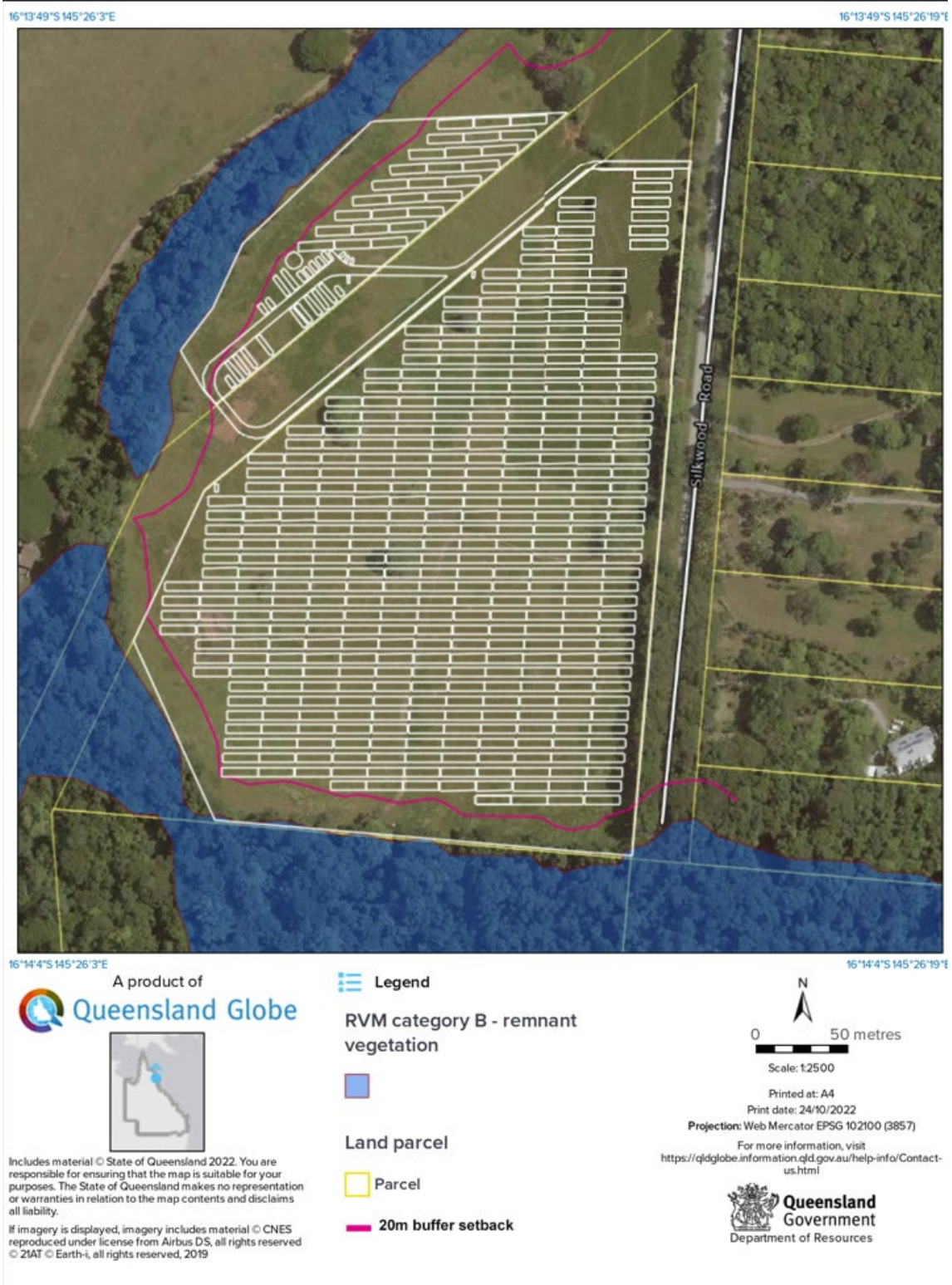
The entirety of the solar farm generation development site has been historically cleared for pasture, and is in continued use for grazing. The site is characterised by improved pasture grass species, with several larger tree genera (*Alstonia*, *Glochidion*, *Melicope*, *Ficus*, *Macaranga*) allowed to regrow as isolated shade and camp trees for the cattle. A drainage line from Silkwood Road maintains isolated successional regrowth with no requirement for vegetation along this ephemeral drainage line to be disturbed.

A review by the Department of Resources (through SARA) has determined that all infrastructure is proposed to be located a minimum of 20m from the existing Category B vegetation and subsequently there are no State Interests relevant to remnant regulated vegetation (see Appendix A SARA pre-lodgement response 2208-30357 SPL).

Regulated vegetation with respect to the solar farm generation site and setbacks is shown in Figure 4.

Protected flora within the solar farm generation site is entirely restricted to occurrences of individuals within approximately an area of 0.34 ha in the south-western corner of the lease plan area. This area of vegetation has been buffered (20m) from development by the maintenance of existing cleared pasture areas and is further separated by a security fence from the development site. The area of vegetation will not be impacted by the proposal.

Figure 3 Regulated vegetation and buffer set backs

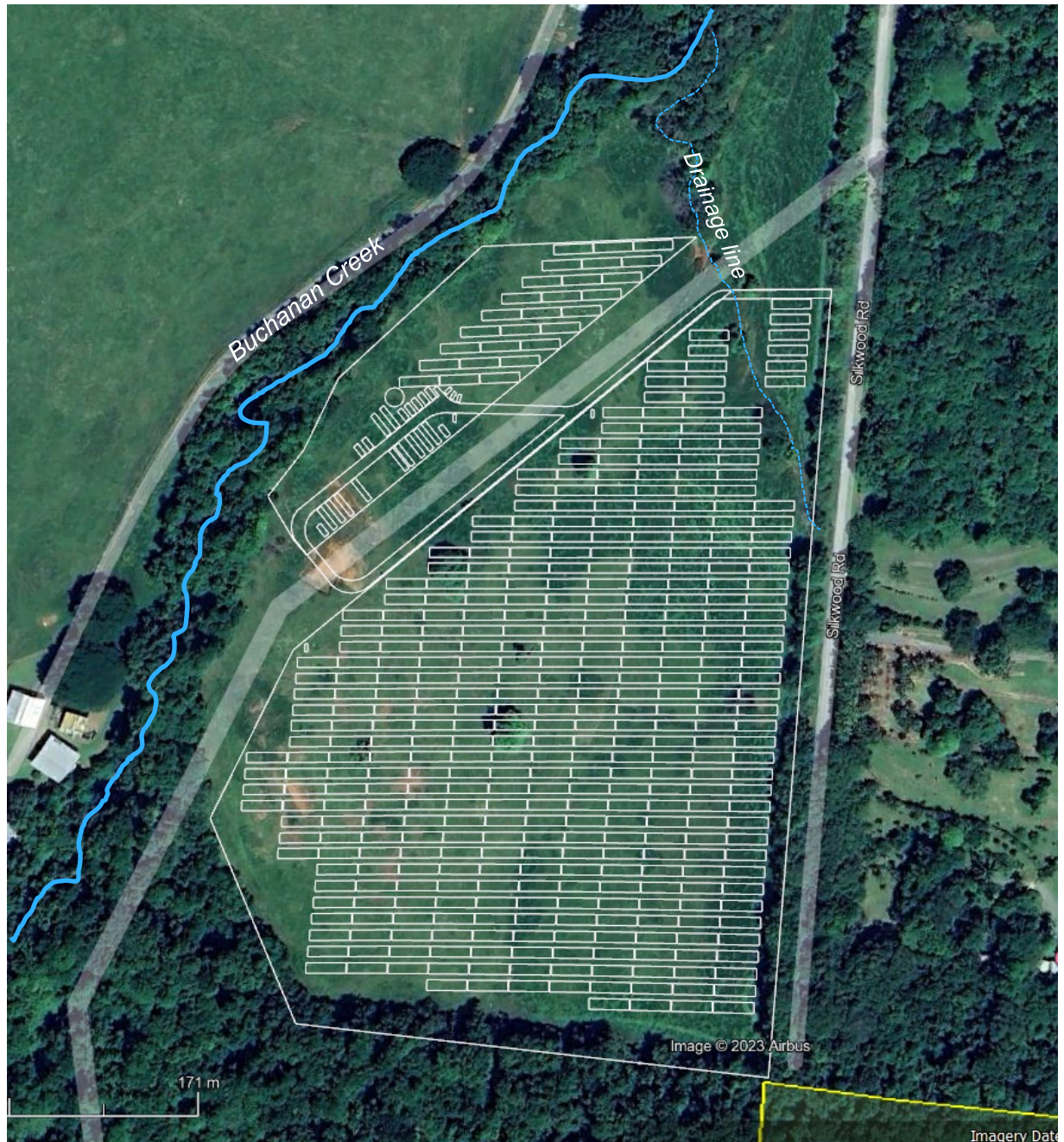


2.7 Existing waterways

The closest regulated waterway is Buchanan Creek, adjacent (but not within) the western boundary of the site. At its closest point Buchanan Creek is 30m from the nearest infrastructure. All riparian vegetation is a minimum of 20m from the infrastructure, with the intervening areas to remain pasture grass. A drainage line from Silkwood Road has been deemed not to be a waterway under the Department of Agriculture and Fisheries policy guideline. This drainage line carries overflow from the

Silkwood Road catchment, but otherwise does not represent any waterway characteristics (see Appendix A SARA pre-lodgement response 2208-30357 SPL).

Figure 4 Site drainage



Note: solar panel layout is indicative only

2.8 Site Contamination

A search of the Environmental Management Register (EMR) and Contaminated Land Register (CLR) has identified that the solar farm site is not included either register. Refer to Appendix F. Geotechnical investigations undertaken across the site in March 2023 have not identified any contaminated soils, and no soils with potential or actual acid sulphate (PASS/ASS) have been identified on site.

3. Development Background

3.1 Commonwealth Interests

The DMG project has been referred to the Commonwealth under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for determination as to whether the DMG project constitutes a controlled action under the EPBC Act. The Commonwealth determination was that the DMG project does not constitute a controlled action, and therefore no referral for assessment was required by the Commonwealth (December 22nd, 2022)..

3.2 Wet Tropics Management Authority

A referral and an application for a permit under s.45 of the *Wet Tropics Plan 1998* was made to the Wet Tropics Management Authority (WTMA) for works within Management Zone C of the Wet Tropics World Heritage Area (WTWHA). A permit for the installation and operation of electricity infrastructure within the WTWHA in the DMG project area was approved as a 'minor and inconsequential action' (July 12th 2023).

The WTMA permit however is not applicable to the solar farm generation site which is adjacent to, but outside of the WTWHA. Notwithstanding, WTMA were obliged to consider the solar farm generation site owing to proximity to the WTWHA which adjoins the south-east corner of the solar farm lease plan area.

4. Statutory Planning Framework

4.1 Planning Act 2016

4.1.1 Assessment Manager

As determined under Schedule 8 of the Planning Regulation 2017, the Assessment Manager for this Development Application is Douglas Shire Council.

4.1.2 Prohibited Development

The proposed DMG project does not constitute prohibited development. This has been determined through consideration of the relevant State and local instruments which identifies prohibited development under the *Planning Act 2016* (PA) and Planning Regulation 2017 including Schedule 10, Parts 2-5, Parts 10-11 and Parts 16 and 20, of the regulations

4.1.3 Category of Development

The solar farm generation site within the lease plan on lot 5 BK157130 represents a Material Change of Use in respect to *‘the start of a new use of the premises’*, and Reconfiguring a Lot in respect to *‘dividing land into parts by agreement rendering different parts of a lot immediately available for separate disposition or separate occupation, other than by an agreement that is a lease for term including renewal options, not exceeding 10 years’*.

Section 44(3) of the *Planning Act 2016* states that “*Assessable Development is development for which a development approval is required*”. Hence, Reconfiguring a Lot and a Material Change of Use for the establishment of the DMG project solar generation site, BESS and Utility Installation aspects of the proposed development in the Conservation Zone is made assessable and requires a development approval under the DSC Planning Scheme in accordance with s43(1) of the PA and is hence, “Assessable Development”.

4.1.4 Assessable Development Statutory Considerations

Aspects of the DMG project solar farm generation facility are Impact Assessable as it under the DSC Planning Scheme within the Conservation Zone. As such assessment must be undertaken against the entire DSC planning scheme for those aspects of the DMG project that trigger impact assessment or require consideration against strategic frameworks and all other relevant assessment benchmarks.

When assessing the application, the relevant considerations of the Assessment Manager in making the decision are in accordance with Sections 59, 60(3), and 62 of the PA and Sections 29-31 of the PR. Specifically, section 60(3) of the PA states for an Impact Assessable application, the Assessment Manager must decide:

- (a) *“To approve all or part of the application;*
- (b) *To approve all or part of the application, but impose development conditions on the approval;*
- (c) *To refuse the application.”*

4.1.5 State Planning Policy

The State Planning Policy (2017) (SPP) outlines 17 state interests arranged under five broad themes:

- liveable communities and housing
- economic growth

- environment and heritage
- safety and resilience to hazards
- infrastructure.

Part E of the SPP identifies various State interests and assessment benchmarks not addressed within the local planning scheme which are required to be considered during the development assessment process.

The SPP Interactive Mapping System² was accessed to determine those SPP that overlay the DMG project solar farm generation site. Those identified (see Appendix D for details) include:

- Flood hazard area – Local Government flood mapping
- Agriculture (Agricultural Land Classification A & B);
- Matters of State Environmental Significance (MSES) – Wildlife habitat (endangered or vulnerable)
- Matters of State Environmental Significance (MSES) – Regulated vegetation (category B)
- Matters of State Environmental Significance (MSES) – Regulated vegetation (category R)
- Matters of State Environmental Significance (MSES) – Regulated vegetation (essential habitat)
- Matters of State Environmental Significance (MSES) – Regulated vegetation (intersecting a watercourse)
- Matters of State Environmental Significance (MSES) – High ecological value waters (watercourse)
- Coastal management district.
- High ecological value water areas.

State Interests identified under the SPP relevant to the DMG project were reviewed by the State Assessment Referral Agency (SARA) with prelodgment advice received 7th November 2022 (Appendix A, SARA ref.: 2208-30357).

4.2 Referrals & State Development Assessment Provisions

The Development Assessment Mapping System (DAMS³), was accessed for the lease plan area on Lot 5 BK157130 to determine that those matters of State interest to be included in a pre-lodgment application to SARA.

DAMS identified the following as matters of State interest refer Appendix A) for the solar farm generation site:

- Native Vegetation Clearing - regulated vegetation Category B 'of concern'.
- Native Vegetation Clearing - regulated vegetation Category X
- Native Vegetation Clearing – Category R on the regulated vegetation management map.

4.3 State Assessment Referral Agency

An initial pre-lodgement advice request was submitted to SARA on 10th August 2022. Initial pre-lodgement advice was issued on 12th September 2022 for application 2208-30357. Subsequent further clarification by SARA was sought on 25th October 2022 with respect to:

² <https://spp.dsdip.esriaustraliaonline.com.au/geoviewer/map/planmaking>

³ <https://dams.dsdip.esriaustraliaonline.com.au/damappingsystem/?accordions=SARA%20DA%20Mapping>

- Water way barrier works
- Marine plants
- Quarry allocation for operational works in tidal areas
- Vegetation management

Final pre-lodgement advice was issued on 7th November 2022 (refer Appendix A) SARA reference 2208-30357 SPL as follows.

Solar farm generation site:

- The Qld Government has no State Interests vested in the solar farm (SARA ref.: 2208-30357 SPL as attached Appendix A).

4.4 Douglas Shire Planning Scheme (2018)

4.4.1 Land Use Definition

The DMG Project comprises two components

- Solar farm generation site.
- Electrical supply network (maximum line voltage being 22kV) – not assessed under this DA..

The solar farm and associated ancillary components are defined under the DSC Planning Scheme Schedule 1 Table SC 1.1.b – Use definitions as:

Renewable Energy Facility.

Premises used for the generation of electricity or energy from renewable (naturally reoccurring) sources, (including solar farm, wind, tidal), but not including wind turbine or solar panels supplying energy to domestic or rural activities on the same site.

Utility Installation.

Premises used to provide the public with the following services: (a) supply or treatment of water, hydraulic power or gas (b) sewerage, drainage or stormwater services (c) transport services including road, rail or water (d) waste management facilities (e) network infrastructure. The use includes maintenance and storage depots and other facilities for the operation of the use.

Battery Storage Facility.

Means the use of premises for the operation of 1 or more battery storage devices. As defined in Schedule 24 of the Planning Regulation 2017

The electricity supply network has a maximum voltage of 22kV and is defined under Schedule 1 Table SC 1.2.b – Administrative definitions as:

Minor electricity infrastructure.

Table SC 1.2.b Administrative definitions (extract)

Performance outcomes	Acceptable outcomes
Minor electricity infrastructure*	<p>All aspects of development for an electricity supply network as defined under the <i>Electricity Act 1994</i>, (or for private electricity works that form an extension of, or provide service connections to properties from the network), if the network operates at standard voltages up to and including 66kV.</p> <p>This includes:</p> <ul style="list-style-type: none"> • Augmentations/upgrades to existing power lines where the voltage of the infrastructure does not increase • Augmentations to existing substation (including communication facilities for controlling works as defined under the <i>Electricity Act 1994</i>) where the voltage of the infrastructure does not increase, and where they are located on an existing substation lot.

*Note –Denotes a Queensland Planning Provisions (QPP) mandatory administrative definition.

4.4.2 Applicable Planning Scheme Overlays Solar Farm Generation Site MCU, RoL, Operational Works

The solar farm generation lease plan area is affected by the following overlays:

- Acid Sulfate Soils Overlay Map Sheet - ASS-005
- Hillslopes Overlay Map Sheet – HS-006
- Landscape Values Overlay Map Sheet -LV-007
- Natural areas Overlay Map Sheet – NA-008
- Transport Network (Road Hierarchy) Overlay Maps – RH-005

Noting that the lease plan area (the solar farm generation site, is a small portion of lot 5 BK157130, which intersects more overlays owing to size of the lot. Those overlays which are occur on lot 5 BK157130, but do not overlay the lease plan area (refer to Appendix L of the Town Planning Report) include:

8.2.4 – Flood and Storm Tide Hazard

8.2.10- Transport Network – Transport Pedestrian Cycle

4.4.3 Applicable Planning Scheme Codes

The following table lists the applicable codes of the DSC Planning Scheme that the solar farm generation site (including the internal road reserve) is subject to assessment against.

Table 3 Applicable Planning Scheme Codes, Solar Farm

DSC Planning Scheme Component	Reference
Zone Codes	
6.2.3 – Conservation zone code	Addressed in s.5.3 this document and Appendix K.
Local Plan Code	
7.2.1 Cape Tribulation and Daintree Coast Code (Diwan-Cow Bay, Precinct 5)	Addressed in s.5.4 this document and Appendix K.

DSC Planning Scheme Component	Reference
Overlay Codes	
8.2.1-Acid Sulfate Soils Overlay Code 8.2.5-Hillslopes Overlay Code 8.2.6-Landscape Values Overlay Code 8.2.7-Natural areas Overlay Code 8.2.9-Potential Landslide Hazard Code 8.2.10-Transport Network Code	Addressed in s.5.5 and Appendix K.
Development Codes	
9.4.3-Environmental Performance Code 9.4.4-Filling & Excavation Code 9.4.3-Infrastructure Works Code 9.4.7-Reconfiguration of a Lot Code 9.4.9-Vegetation Management Code	Addressed in s.5.6 of this document and Appendix K.

5. Planning Scheme Assessment

5.1 Introduction

This development application represents the culmination of 6 years of planning into the design, construction and operation of a renewable energy facility that seeks to:

- (a) Provide an equitable option to Daintree landholders north of the Alexandra Range to connect to grid supplied renewable energy source
- (b) Reduce the reliance on hydrocarbon based electricity generation, and remove potentially between 8,000 to 10,000 metric tonnes of carbon emission per year (depending on landholder connections).
- (c) Utilise new and reliable technologies, being a hybrid solar/hydrogen electricity generation system developed in collaboration with the CSIRO HyResource partnership.
- (d) Does not rely on traditional hazardous type electrical generation and distribution networks, and uses new and reliable technologies, e.g. dry type transformers and solid state electronics. For example, the primary byproduct of the emergency generation system (Jenbacher generator) is water vapour when powered by hydrogen..
- (e) Adopt a design, location and setting for the DMG project such that all components are located in areas cleared of native vegetation cover, or vegetation and habitat can be avoided through the use of alternate construction methods (e.g. underground).
- (f) Provide minimal visible amenity impacts to the Daintree experience. The solar farm being only visible from traffic on Silkwood Road.
- (g) Maintain the biodiversity and scenic values of the Daintree without compromise.
- (h) Engages the Eastern Kuk Yalanji Traditional Owners in a meaningful way, including recognition of Return to Country aspirations, consultation throughout the design and construction of the infrastructure.

This Planning Scheme Assessment has concluded that while the DMG project represents a new, and undefined use for the Conservation Zone, it does not include any prohibited development, and addresses and fulfils various Planning Scheme Strategic Framework Themes, Elements and Specific Outcomes.

A full assessment of the proposed DMG project has been undertaken against the applicable codes of the Planning Scheme and is presented in Appendix K, Tables of Assessment. The DMG project largely complies with all those requirements for the applicable assessment codes as demonstrated in Appendix K.

Where there are departures from 'deemed to comply', the alternative solutions offered are those that predominantly reflect conditions required under the various electricity generation and distribution regulatory requirements, or are owing to very specific functional requirements for the construction and operational parameters of the DMG project.

5.2 Strategic Framework

When assessing an Impact Assessable application, under the provisions of the Planning Regulation, particularly s.31(1)(b), the Assessment Manager must have regard to the whole Planning Scheme, including the Strategic Framework.

The Strategic Framework for the DSC Local Government Area identifies a series of Themes, Elements and Specific Outcomes which sets policy direction and forms the basis of ensuring that appropriate development occurs within the planning scheme area for the duration of the planning scheme.

The following provides a review of the DMG project features against the *relevant* sections of the strategic framework.

5.2.1 Theme 1 – Settlement pattern

Strategic outcomes

The DMG project does not include components that would compromise the strategic outcomes or any elements of the Settlement pattern theme. In particular it is noted that the introduction of grid supplied electricity into the Daintree area has long been an area of public interest. Numerous reports have been undertaken into investigations of various options to introduce grid supplied electricity. A primary element of consideration has been the potential impact of the introduction grid power on settlement and development rates that may impact on the ecological landscape of the Daintree. These ‘facilitative’ impacts have been examined in numerous studies, with general consensus being that grid supplied electricity should only be considered when:

- a) There are equal or less properties available for development than there are properties that have been acquired for conservation purposes, or under some form of formal conservation covenant.
- b) There are regulatory/planning provisions in place to control native vegetation clearing on private lands (introduced with DSC planning controls in 2006).
- c) Both the generation and distribution of mains supplied electricity is in a manner that is compatible with the social and ecological values of the Daintree area.

In all the above aspects, the DMG project meets the main criteria that have been identified in various reports. In consideration of facilitative impacts, this scenario has been considered by Commonwealth (EPBC approval) and State (WTMA approval) during their assessments of the project.

The conclusion accepted was that the DMG project will have no quantifiable impact on development as a facilitative impact, and therefore on the Settlement pattern of the Daintree as:

- a) Existing drivers/limitations on development in the Daintree identified in the various reports, e.g., access to higher level schooling, land/house pricing inflation, reliability of water supply, transport congestion at the Daintree River ferry, will continue to remain in the DMG project area and are independent of the DMG project.
- b) All original planning precepts that were to be achieved prior to grid electricity being reconsidered have been met (refer points above). This includes introduction of planning controls (DSC 2006) and adoption of an environmentally sensitive design (VA, this project).

Additionally, there are two other important limitations on the ability of the DMG project to promote facilitative development. These include:

1. Conditions from the Australian Energy Regulator (AER) under the National Energy Retail Law (NERL), s. 110 which sets the “obligation to supply” framework, have been formalised between VA and the AER. This includes the acknowledgement by the AER that the DMG project is exempt from:

.Condition 1 – Obligation to supply

The obligation to supply does not apply to new customers or existing customers who seek to significantly increase their electricity load.

Significantly, the DMG project commitment to ‘obligation to supply’ is to existing lawful developments (private and commercial) with development (commercial/residential) as approved through the Douglas Shire Council Planning Scheme. ‘Obligation to supply’ under the NERL does not extend to undeveloped properties without development approvals, or allow potential existing

businesses/residences to increase their electricity load (e.g. Air B n B adding extra accommodation with air-conditioning etc).

2. DMG generation limitation: The DMG project solar generation capacity is limited by the available solar array area (which cannot be expanded), the nature of the technology (solar/hydrogen hybrid), and the length of the distribution network (56km of road reserves – not part of this DA). Generation capacity is 7.9mW, with the equipment being Tier 1, and the project system allows for N+1 reliability with backup capacity. “N+1” means that the system (at central generation site) is capable of experiencing outage of its generation system without causing loss in electricity supply. The allowance for N+1 reliability is based on existing customer forecast and does not include further connections or increases in electricity load for: a) undeveloped properties without development approvals (either residential or commercial), or allows b) approved developments to increase their electricity load. The DMG project generation site has been developed in conjunction with the CSIRO HyResource project⁴.

In all contexts, it is believed that the DMG project is consistent with the DSC Strategic Plan, Theme 1, Settlement Patterns.

Element 3.4.8: Recognition of the rights and interest of native title landholders.

The DMG project design has been developed in consultation with Jabalbina Aboriginal Corporation, representing the Eastern Kuku Yalanji with a specific acknowledgment in assisting the Traditional Owners with their Return to Country aspirations.

In consideration of this, the DMG project specifically addresses Element 3.4.8: Recognition of the rights and interest of native title landholders. A letter of support from Jabalbina Aboriginal Corporation is attached as part of this application. Refer Appendix J.

5.2.2 Theme 2- Environment and landscape values

Strategic outcomes

The DMG project demonstrates compliance with a number of strategic outcomes presented for the DSC Planning Scheme area. These are identified in the relevant Elements in the following. include:

Element 3.5.2 – Aboriginal cultural heritage values

Acknowledgment of the custodianship and Aboriginal cultural heritage values through the engagement of Jabalbina in preparing a Cultural Heritage Risk and Assessment report (sensitive and in-confidence, and not part of this application) for the DMG project which has guided design and construction concepts and layouts, commissioning of artwork for the painting of the 27 kiosk transformers, as cultural heritage observers during construction, and assisting with the Return to Country aspirations. A separate CHMP, if determined to be required by Eastern Kuku Yalanji, will be commissioned and managed by Jabalbina.

Element 3.5.3 – Biodiversity

All aspects of the DMG project have been designed with the protection of biodiversity as a foremost consideration. To this end, the DMG project has:

- Located the hybrid solar/hydrogen generation plant in existing cleared areas, which require no native vegetation clearing, and which maintain buffers of existing cleared areas between proposed infrastructure and native vegetation and fauna habitat a minimum of 20m.
- Fauna friendly design – the infrastructure has been designed to be solid state, has no hazardous liquid (e.g. PCB transformer oils) or vulnerable components in fauna accessible

⁴ <https://research.csiro.au/hyresource/daintree-microgrid-project/>

areas, is containerised and sealed from fauna access, uses fauna sensitive light and fencing designs that preclude entrapment fencing types (e.g. barbed wire will not be used).

- Distribution cabling is underground, requiring no vegetation/habitat clearing for other construction or maintenance, and will be installed either via trenching or horizontal directional drilling. All ancillary structures are sealed, have no moving parts, have no hazardous emissions (including EMF/noise).
- Direct and indirect disturbance to highly sensitive habitats, such as the adjacent WTWHA and Buchanan Creek, are completely avoided, with all works and infrastructure a minimum of 20m (cleared buffer area), from these localities.
- A strict biosecurity protocol will be followed for construction, operation and maintenance of the DMG, as set out in the EMP for the project (refer Appendix G, Project EMP).

Element 3.5.4 – Coastal zones

Element 3.5.4 is not specifically applicable to the solar farm generation site, as the location is not within a defined coastal zone. Notwithstanding, the road reserve cable distribution network (not part of this DA) has considered the impact of coastal processes, and consideration of climate change scenarios has generally been included in the design components of the DMG project.

Element 3.5.5 – Scenic amenity

Scenic amenity is a significant component of the 'Daintree experience' and is a valued asset to Douglas Shire. Scenic amenity has been specifically considered throughout the design phase and will be incorporated into construction.

With respect to the design phase, a number of key elements have been incorporated into the DMG project. These include:

- Locating the solar farm generation site in a location that is least visible from any public or private vantage point. The solar farm is not visible from any protected area estate view point, not from the residences on any private property. The solar farm is only visible to the very minor traffic on Silkwood Road accessing their properties.
- In consideration of the above, the proponent has undertaken to thicken the existing native vegetation along the Silkwood Road reserve to further shield the solar farm generation site from local access along the road.

Element 3.5.6 – Air and acoustic protection and hazardous materials

The DMG project does not result in any requirements for air and acoustic protection, nor does project result in the generation and emission of hazardous materials. The DMG project relies on solar powered electrolysis to generate hydrogen, which will be used as a fuel source for the battery energy storage systems (BESS). Approximately 40% of the solar component electricity will be fed directly into the distribution network, the balance being provided by the BESS. Two backup Jenbacher generators which are dual fuel hydrogen/LPG are part of the redundancy systems and will be used when extreme cyclonic conditions interrupt normal energy generation processes. The emissions when the backup hydrogen power plant are used, are water vapour, with no particle contaminants. When LPG is used, the emissions are significantly lower than other types of fuel usage. The noise level from the generators is commensurate with the Qld Environmental Protection (Noise) Policy 2019 and complies with relevant DSC policy on noise emissions that includes:

- 10pm – 7am no audible noise;
- 7am – 7pm, no more than 5dB(A) above the background level;
- 7pm – 10pm no more than 3dB(A) above the background level.

The emergency backup generator noise will not be discernible from any noise sensitive receiver

(including environmental habitats and residences).

Hydrogen stored during the electrolysis process is stored in accordance with the relevant standards and volumes stored do not constitute hazardous materials storage or require an Environmental Authority (EA) as an Environmentally Relevant Activity (ERA) under the Qld *Environmental Protection Act 1994*.

Most of the equipment is solid state, and will not generate any discernible noise, emissions or house hazardous substances (e.g., PCB transformer cooling oils).

5.2.3 Theme 2 - Natural resource management

Management of soil, water and the abiotic environment has been a driving consideration in the design, location and construction methodologies for the DMG project that will minimise the potential for impact on natural resources in the project area.

Key aspects of the above are the DMG project has adopted a minimal earth disturbance footprint to minimise the potential for impacts to water quality and off-site habitats. This includes:

- no major earthworks for the solar farm generation site, with the PV arrays to be sited on the existing contours of the site slope,
- the use of pad mounted and containerised solar farm ancillary structures that do not require extensive cutting and filling to establish,
- minimum setbacks of 20m from vegetation and over 45m from the high point of Buchanan Creek (the nearest waterway).
- Underground cabling throughout the solar farm site, including using horizontal directional drilling (HDD) where required.

In addition, a strict biosecurity management plan framework has been identified in the project EMP (see Appendix G) for the construction phase and ongoing operational phase that will ensure that the DMG project will not be responsible for the further spread of existing pests, nor for the introduction of new pests to the project area.

5.2.4 Theme 6 – Infrastructure and transport

Element 3.9.2 – Energy

The above element within Theme 6 of the Strategic Plan has identified outcomes in s.3.9.2.1 directly related to the DMG project.

Specifically, outcome (4) states:

The paradox of polluting fuel-based power generation and the pristine World Heritage setting of the Daintree rainforests, north of the Daintree River is acknowledged. Proposals to extend electricity supply to properties north of the Daintree River take into account the sensitive environmental characteristics of the area, the fact that it is an area that is largely of world heritage significance and the climatic risks impacting the area such as cyclones and other weather events, all of which will influence decisions about the nature and scale of the electricity supply infrastructure which may be provided.

The acknowledgement of the juxtaposition of a power generation facility and distribution network within an area regarded as largely possessing World Heritage values has been a pre-eminent factor in the concept and design of the DMG project that has been in development since 2017. With this in mind, the design, construction and operation of the DMG project as presented in this development application and in this supporting document Appendices demonstrates full compliance with the specific outcomes for Element 3.9.2.

5.3 Zone Code Assessment

As impact assessable development within the Conservation Zone, a full assessment of the DMG project against all the relevant Performance and Acceptable Outcomes is provided in Appendix K, Tables of Assessment. The assessment demonstrates that the DMG project development complies with, or can be conditioned to comply with, the Conservation Zone Code for the solar farm generation site. In those instances where there are Alternative Solutions, these are driven by specific functional requirements of the infrastructure of the DMG project. However, to demonstrate full compliance with the code, specifically PO5, a further assessment demonstrating compliance with the Purpose and Overall Outcomes of the Code is provided as applies to the solar farm generation site (MCU and RoL impact assessable) and to operational works within the solar farm generation site (code assessable).

Table 4 Conservation Zone Code Assessment

Code Requirement	Comment
Purpose	
<i>"The purpose of the Conservation zone code is to provide for the protection, restoration and management of areas identified as supporting significant biological diversity and ecological integrity."</i>	<p>Complies:</p> <p>The DMG project has been designed from the outset with the intent of providing infrastructure that can be constructed, operated and maintained with the most minimalist environmental disturbance footprint possible. This includes:</p> <ul style="list-style-type: none"> • avoiding remnant native vegetation clearing for all components, • location within existing cleared area (pasture), • adoption of alternative, renewable energy supply options whose most significant emissions will be water vapour from the backup hydrogen powered generator (when required), • an underground distribution network impervious to climatic extremes, and • solid-state fauna friendly design elements with system components that need no hazardous chemicals (e.g. transformer cooling oils).
(2) "The local government purpose of the code is to:"	
<p>(a) <i>"Implement the policy direction set in the Strategic Framework, in particular:</i></p> <ul style="list-style-type: none"> i. <i>Theme 2: Environmental and landscape values, Element 3.5.2 – Aboriginal cultural heritage values, Element 3.5.3 – Biodiversity, Element 3.5.4 Coastal zones.</i> ii. <i>Theme 3: Natural resource management, Element 3.6.2 – Land and catchment management,</i> iii. <i>Theme 4: Strong communities and identity, Element 3.7.8, Strengthening indigenous communities."</i> 	<p>Complies:</p> <p>An assessment against the Strategic Framework for these Themes, where applicable, is presented in s.5.2 of this document.</p>
<p>(b) <i>"Conserve and maintain the integrity of biodiversity values, wildlife, habitats and other significant ecological assets and processes over time, across public and private lands."</i></p>	<p>Complies:</p> <p>As noted above, the DMG project will not require disturbance to any biodiversity aspect that will compromise habitat integrity or availability, or impact on ecological assets and processes in either public or private lands.</p>

Code Requirement	Comment
(3) “The purpose of the code will be achieved through the following overall outcomes:”	
(a) <i>“Biological diversity, ecological integrity and scenic amenity are protected.”</i>	<p>Complies:</p> <p>As above: additionally, the scenic amenity experience of the Daintree has been maintained through locating the solar farm generation site away from public and private viewing areas – being only visible to traffic on Silkwood Road (a minor rural road servicing limiting residences), and then only partially owing to the screening effect of existing roadside vegetation and the proposed thickening of this vegetation. The cable distribution network is underground,</p>
(b) <i>Any recreational or other uses of areas that are in the control of the Crown, or the Council, such as reserves, national parks and the Wet Tropics World Heritage Area or areas adjacent to these areas, are consistent with the management plans of the controlling authority so that conservation and scenic values of these areas are not adversely affected;</i>	<p>Complies:</p> <p>The south-east corner of the DMG project solar farm site adjoins the WTWHA, and approximately 14.5km of cables will be laid in the World Heritage Area. A referral has been made to the Commonwealth under the provisions of the EPBC Act (for the entirety of the DMG project), with the Commonwealth making the determination that the DMG project did not constituted a ‘significant action’ and as such, a referral for determination / assessment to the Commonwealth was not required.</p> <p>Similarly, an application was made to the Wet Tropics Management Authority for a permit to undertake the cable laying works within Zone C of the Wet Tropics World Heritage Area. An approval was given by WTMA under s.45 of the Wet Tropics Plan as a minor and inconsequential action.</p>
(c) <i>Any use of land in private ownership does not affect the environmental, habitat, conservation or scenic values of that land or surrounding area;</i>	<p>Complies:</p> <p>Refer comment responses above for information on the design, construction and operational aspects of the DMG project that fulfill this outcome.</p>
(d) <i>Any low intensity facilities based on the appreciation of the natural environment or nature-based recreation only establish where there is a demonstrated need and provided they have a minimal impact on the environmental and scenic amenity values of the site or surrounding area.</i>	<p>Not applicable:</p> <p>This particular purpose is not addressed by the DMG project.</p>
(e) <i>The provisions of the Return to Country Local Plan facilitate economic and social opportunities on traditional Indigenous lands;</i>	<p>Complies:</p> <p>The DMG project has engaged from the outset of the DMG project with Jabalbina representing the Eastern Kuku Yalanji. Jabalbina have formally acknowledged that the DMG project is an important project for their Return to Country aspirations, and have supported this project through the EPBC and WTMA approval processes. A letter of support is appended as part of this application. Refer Appendix J.</p>
(f) <i>Further lot reconfigurations other than amalgamations, boundary realignments to resolve encroachments, or for the practical needs of essential community infrastructure, or to facilitate Return to Country outcomes do not occur.</i>	<p>Complies:</p> <p>No further lot reconfigurations are required for the DMG project.</p>

5.4 Cape Tribulation & Daintree Coast Local Plan Code Assessment

The solar farm generation site is located within Precinct 5 *Low Impact Rural Production and Tourism Enterprise* of the Cape Tribulation and Daintree Coast Local Plan Area and a full assessment against the Performance Outcomes for Precinct 5 is provided in Appendix K, Tables of Assessment

The assessment demonstrates that the DMG project development complies with, or can be conditioned to comply with, development within Precinct 5. In those instances where there are Alternative Solutions, these are driven by specific functional requirements of the infrastructure of the DMG project.

A summary of the salient overall features of the Cape Tribulation & Daintree Coast Local Plan with respect to the DMG project is presented below.

Table 5 Cape Tribulation & Daintree Coast Local Code Assessment

Code Requirement	Comment
Purpose	
<i>"The purpose of the Daintree River - Bloomfield River local plan is to retain the attraction of the area as a very low-key, largely undeveloped nature-based recreation environment, based on the exploration and appreciation of the natural environment and to ensure that any development that does occur is appropriate and does not place additional pressures on the values of area."</i>	<p>Complies:</p> <p>The DMG project will not provide any obstructive viewsheds that would diminish the Daintree experience with respect to nature-based recreational appreciation of the region. The project components are largely not visible to the public, the only visible evidence being the ancillary infrastructure within the road reserve network (transformers and junction boxes/ switch gear), and the solar farm PV arrays from traffic on Silkwood Road, a minor dead-end rural road. No part of the solar farm generation site can be viewed from any private residence in the area.</p> <p>As a renewable energy project, the DMG project has applied the best technology to the design, construction and operation of the project. This includes the use of solid-state technology, battery and transformer systems which do not use hazardous materials (e.g., PCB transformer cooling oils) and a backup power generator (hydrogen powered) whose emissions are water vapour. A key aspect is providing an option to landholders to reduce their reliance on hydrocarbon powered generators, and thereby removing between 8,000 to 10,000 metric tonnes/annum (depending on customer connections).</p>
Purpose: Precinct 5 - Low impact rural production and tourist enterprise precinct	
<i>The purpose of Precinct 5 as detailed on the Local Plan maps contained in Schedule 2 is to recognise existing rural areas and permit their continued use, while encouraging low-impact tourism enterprise including bed and breakfast, short term accommodation (being farm stay accommodation) and nature-based tourism (being forest stay accommodation) as an alternative land use, where significant restoration and/or rehabilitation measures are undertaken as an incentive.</i>	<p>Alternative solution:</p> <p>The DMG project is an undefined use within the DSC Conservation Zone, and as a renewable energy facility, has not been identified within Precinct 5. Notwithstanding, the DMG project is a low-impact project: visually, environmentally, and provides significant support to all forms of local tourism in manner which does not compromise the Daintree experience.</p> <p>The DMG project does comply with the overall purpose of the Conservation Zone, and the Daintree River – Bloomfield River Local Plan. In all instances, the relevant PO applicable to the DMG project which are not directly addressed to a renewable energy facility can be conditioned to ensure compatibility with the precinct PO.</p>

5.5 Overlay Code Assessment

The DMG project is subject to a number of overlays under the DSC Planning Scheme. These overlays have been identified under the various planning maps, noting that in some cases the lease plan area within lot 5 BK157130 overlaps two map sheets. It is noted that the solar farm lease area is only a small portion of lot 5 BK157130 and some overlays which impact on this lot, are not applicable to the lease plan area.

A summary of overlays, their applicability to the project and commentary is provided below, noting that there are no overlays applicable to the operational works within the lease area internal road reserve as confirmed in the DSC Planning Scheme Tables of Assessment. A full assessment of the PO against the various overlay codes is provided in Appendix K.

Table 6 Overlay Code Assessment – lease plan area only

Overlay Code	Comment
Acid sulphate soils overlay	<p>Complies:</p> <p>A small part of the northern extent of the lease plan area has been identified as being included within the acid sulphate soil overlay – map ASS-005.</p> <p>A geotechnical investigation has been undertaken for the DMG project that includes an assessment of the presence of potential or actual acid sulphate soil (PASS/ASS) conditions within the DMG project area. Refer Appendix H, Geotechnical Report.</p>
Hillslopes Overlay Code	<p>Complies:</p> <p>All components of the solar farm generation site comply with the PO of the Hillslopes Overlay Code. Only a very small area within the lease plan area is identified on map HS-006. The solar farm generation site does not require development on any slope >1:6, nor will be the source of any significant visual amenity obstruction. The site is primarily obscured from public view, visible only to local traffic on Silkwood Road, and is not visible from any residence or business in the area. The site is not within any slope hazard area, and will not have any aspect protruding above a ridgeline.</p>
Landscape Values Overlay Code	<p>Mostly Complies – alternative solution:</p> <p>The solar farm generation site is within a High Values landscape overlay identified on map LV-007. The solar farm generation site broadly complies all PO of the high values landscape code. The only variation being AO1.5.</p> <p>For this AO, the solar farm PV arrays have specialised crystalline silicon wafers absorption surfaces which are necessary to convert UV rays into electrons. PV solar panels are designed to have low levels of reflectivity enabling as much light as possible to be absorbed thereby increasing electricity production and efficiency. To limit reflection, PV panels are constructed of dark, light absorbing materials and may be covered with an anti-reflective coating. The metal frames and mounting structures for panels may have glint and glare impacts, although these components are usually covered by the solar panel itself or limited to a small surface area.</p> <p>The PV panel structures are the only departure from complying with all other relevant AO of the code. All other aspects of the solar farm infrastructure have a subdued and non-reflective</p>

Overlay Code	Comment
	nature, the primary colour being of green hues. The PV panels are not visible from any residence or place of business, and are only visible to the occasional local traffic on Silkwood Road. Existing vegetation along this road provides partial screening, and the proponent will engage a commercial revegetation contractor to infill and 'thicken' the existing vegetation with native species to further improve the screening effect.
Natural Areas Overlay Code	<p>Complies</p> <p>The DMG project complies with all aspects of the Natural Areas Overlay Code. A key aspect in the design of the project has been the protection and/or minimising the impact of the project construction, operation and maintenance on all matters of environmental significance.</p>
Transport Network Overlay Code	<p>Complies</p> <p>The solar farm generation site is located off Silkwood Road, a minor rural road as identified on map RH-005. The DMG project complies with all aspects of development with respect to the transport overlay codes.</p> <p>The DMG project design and infrastructure team have been engaged with DSC road transport and infrastructure engineers during the project design. A traffic management plan for the construction phase of the project will be prepared in consultation with DSC as many of the components within the road reserve will be subject to ongoing engagement with DSC road transport engineers.</p>

5.6 Development Code Assessment

The solar farm generation site is subject to assessment against the following applicable development codes::

- 9.4.3-Environmental Performance Code
- 9.4.4-Filling & Excavation Code
- 9.4.5-Infrastructure Works Code
- 9.4.7-Reconfiguration of a Lot Code
- 9.4.9-Vegetation Management Code

A summary of the development codes, their applicability to the project and commentary is provided below. A full assessment of the PO against the various overlay codes is provided in Appendix K.

Table 7 Development Code Assessment

Development Code	Comment
Environmental Performance Code	<p>Complies:</p> <p>All components of the solar farm generation site, including operational works in the road reserve within the lease plan area comply with all parts of this code. Refer Appendix K. An EMP has been developed for this project and is attached as Appendix G.</p>
Infrastructure works code	<p>Complies:</p> <p>All components of the solar farm generation site, comply with all parts of this code. Refer Appendix K. An EMP has been developed for this project and is attached as Appendix G.</p>

Development Code	Comment
Filling & Excavation Code	<p>Complies:</p> <p>Filling and excavation works are limited in scope to primarily construction of the access track along the internal road reserve, drainage establishment, and the creation of level pads. Expected earthworks >25m³ but less than 50 m³. All components of the solar farm generation site, including works in the road reserve within the lease plan area comply with all parts of this code. Refer Appendix K. An EMP has been developed for this project and is attached as Appendix G.</p>
Reconfiguration of a Lot Code	<p>Complies:</p> <p>All components of the solar farm generation site comply with, or can be conditioned to comply with, all relevant PO of the reconfiguration of a lot code. Refer Appendix K, Tables of Assessment.</p>
Vegetation Management Code	<p>Complies:</p> <p>All components of the solar farm generation site comply with, or can be conditioned to comply with, all relevant PO of the Vegetation Management code. Refer Appendix K, Tables of Assessment.</p>

6. Summary and Conclusions

The DMG project is located in its entirety within the Conservation Zone of the DSC Planning Scheme with the overall purpose of the Conservation Zone being:

“The purpose of the Conservation zone code is to provide for the protection, restoration and management of areas identified as supporting significant biological diversity and ecological integrity.”

While the DMG project represents aspects of impact assessable land uses within the Conservation Area north of the Daintree River, it does not include ‘prohibited development’ and the proposed land uses are not specifically identified as an ‘inconsistent use’. All aspects of the DMG project complies with the Overall Purpose of the Conservation Zone.

We believe there is no conflict between the DMG project, and the purpose of the Conservation Zone, and to a wider extent the Douglas Shire Planning Scheme (2018) as a whole. The DMG project represents a sustainable, alternative energy source that has no reliance on any hazardous materials, generates no harmful emissions, and its construction, operation and maintenance does not require the disturbance of native habitats, flora/fauna or has any discernible impact on the Daintree experience to residents or visitors.

Consequently, we request the Douglas Shire Council to approve this Development Application in order to herald in what we believe is an outstanding opportunity, to showcase how technology, the environment and social equity issues can be integrated to provide a harmonious vision for the management of the Daintree.

Appendices

Appendix A – SARA prelodgment response - 2208-30357 SPL



SARA reference: 2208-30357 SPL

Applicant reference: -

7 November 2022

Volt Advisory
C/- Environment Pacific Pty Ltd
PO Box 724
EDGE HILL QLD 4870
andrew.small@environmentpacific.com

Attention: Dr Andrew Small

Dear Sir/Madam,

SARA Pre-lodgement advice – Solar farm and distribution network, Cow Bay

I refer to your request for pre-lodgement advice received on 25 October 2022 in which you sought further clarification on potential referral and approval requirements identified in the pre-lodgement advice issued by the State Assessment and Referral Agency (SARA) on 12 September 2022. This notice provides advice on aspects of the proposal that are of relevance to SARA.

SARA's understanding of the project

The proposed development involves the construction and operation of an 8MW solar farm on land located at Buchanan Creek Road, Cow Bay and described as Lot 5 on BK157130. Details of the proposed development identified in the pre-lodgement material includes:

- The proposed development will involve solar generation with hydrogen storage/production, that will address the region's reliance on individual diesel generation.
- The generation station will comprise a solar farm, battery storage, containerised electrical switchgear and a containerised hydrogen electrolyser and fuel cell.
- Excess energy production during the dry season will be stored in a pressure hydrogen tank (up to 500kg) which will be consumed during the wet as a baseload removal at night.
- Water capture is done on site by rainfall collection and recycling the exhaust gases of the fuel cell and stored in a 110,000 litre tank.
- The solar/hydrogen generation farm is proposed to be located on a cleared parcel of land with an area of approximately 7.9ha.
- The distribution network will involve approximately 150km of cables extending north from the solar farm site.

- All electrical cables will be installed underground, either via horizontal directional drilling, or trenching entirely within the road reserve without the requirements to remove vegetation.
- All watercourses will be either directionally drilled beneath the watercourse or attached to existing overhead infrastructure.
- The solar farm will be located on a lease for a period that exceeds ten years.

Supporting information

The advice in this letter is based on the following documentation that was submitted with the pre-lodgement request.

Drawing/report title	Prepared by	Date
Cable_Civil Network	Volt Advisory	Uploaded to MyDAS2, 10 August 2022
DaintreeBoundary	Volt Advisory	Uploaded to MyDAS2, 10 August 2022
StationOverview	Volt Advisory	Uploaded to MyDAS2, 10 August 2022
Volt Advisor Daintree Renewable Microgrid Pre-Construction Feasibility Study Access Arrangement for Assets Report	Arcadis	30 August 2020
Presentation to the Commonwealth - Daintree Micorgrid Project – Cow Bay to Cape Tribulation	Volt Advisory	Uploaded to MyDAS2, 10 August 2022
Technical documents REV	Volt Advisory	Uploaded to MyDAS2, 10 August 2022
Correspondence RE: 2208-30357 SPL Pre-lodgement advice – Further clarification required Daintree Microgrid Project	Andrew Small	24 October 2022

Pre-lodgement advice

The following advice outlines the aspects of the proposal that are of relevance to SARA.

SARA's jurisdiction and fees	
1.	<p>Based on the revised pre-lodgement material provided, the proposed development of the electricity distribution network will require referral to SARA under the following provision of the Planning Regulation 2017 (Planning Regulation):</p> <ul style="list-style-type: none"> • Schedule 10, Part 17, Division 3, Table 1 – Operational work that is tidal works and work in a coastal management district. This will require a fee of \$3,516 (fee item 8(e)). <p>SARA would be a referral agency and Douglas Shire Council the assessment manager for prescribed tidal works.</p> <p>The solar farm component of the development application does not require referral to SARA as the plans have been amended to avoid native vegetation clearing as a result of exemptions and sufficient details have been provided to confirm that the site does not contain a waterway.</p>
Marine plants	
2.	Marine plants include:

	<ul style="list-style-type: none"> any plant (a tidal plant, including marine algae) that usually grows on or adjacent to tidal lands whether it is living, dead, standing or fallen; or any plant material on tidal land (up to the level of HAT). <p>Plants such as mangroves, mangrove fern, saltcouch or samphire species are considered marine plants regardless of whether or not they are above or below the level of HAT.</p> <p>Marine plants do not include:</p> <ul style="list-style-type: none"> a plant that is prohibited matter or restricted matter under the <i>Biosecurity Act 2014</i>; or a plant that is controlled biosecurity matter or regulated biosecurity matter under the <i>Biosecurity Act 2014</i>. <p>Marine plant protection applies irrespective of the tenure (e.g. unallocated state land and all state tenured lands, including private freehold and leasehold lands) of the land on which the plant occurs, the time the plant has been growing at the location, or the degree of or purpose of the disturbance.</p> <p>The further pre-lodgement material provided identifies that a survey of the entire cable construction footprint has been undertaken. Results from the survey state that marine plants are restricted throughout the project area to locations beside the Cape Tribulation Road reserve adjacent to the Cooper Creek estuary at Thornton Beach. Within this area it is proposed to locate the cable under the traffic lanes, however this is pending negotiations regarding traffic impacts with Douglas Shire Council.</p> <p>As proposed, the development does not involve the removal, destruction or damage of marine plants and therefore does not require notification under the Department of Agriculture and Fisheries (DAF) Accepted Development Requirements (ADR) or approval for removal, destruction or damage of marine plants.</p> <p>However, if it is not possible to locate the cable under the traffic lanes near the Cooper Creek estuary and the cable is located in the outer road reserve, marine plants are likely to be impacted as a result of the works. As identified in the pre-lodgement advice issued on 12 September 2022, the works may be undertaken in accordance with work types 2.15 and 2.24 of the ADR provided the maximum disturbance footprint is 25m² or if the works can not comply with the ADR, a development application will be required.</p>
Waterway barrier works	
3.	<p>Guidance as to the likely location of waterways in Queensland is presented in the spatial data layer <i>Queensland waterways for waterway barrier works</i>. Please note that not all waterways that are present on-ground may be captured by this data layer. For more information, refer to the Guide to determining waterways.</p> <p>The following factsheets provide more information on waterway barrier works:</p> <ul style="list-style-type: none"> What is a waterway?; What is a waterway barrier work?; What is not a waterway barrier work? <p>Horizontal directional drilling (HDD) to install the cable network is unlikely to constitute waterway</p>

	<p>barrier works. If this methodology changes and works result in raising the bed level or reducing the cross-sectional area of the waterway, the works may constitute waterway barrier works.</p> <p>The previous pre-lodgement advice indicated that there may be a waterway on the solar farm site (Lot 5 on BK157130) that is not displayed on the spatial data layer. Sufficient evidence has been provided in the further pre-lodgement material to demonstrate that the feature does not meet the requirements to be considered a waterway that provides for fish passage. The feature is stated to be a series of disconnected depressions, lacks fish habitat at the upstream of the site and does not have continuous flow beyond local rainfall vents. The pre-lodgement material indicates some level of defined bed and banks, however if the feature doesn't flow beyond local rainfall events, fish are unlikely to access the area.</p>
Native vegetation clearing	
4.	<p>The revised pre-lodgement material indicates that the location of the solar farm component of the proposed development on Lot 5 on BK157130 has been amended and the revised plans indicate that:</p> <ul style="list-style-type: none"> • All proposed solar farm infrastructure is located in the category X area. • All proposed solar farm infrastructure other than a fence, road and underground services, has been setback 20 metres from the mapped regulated vegetation and therefore achieve an adequate firebreak/safety buffer. <p>As a result of the amendments made to the layout of the solar farm, no clearing of regulated vegetation will result from the proposed development and therefore referral for this matter is not required.</p> <p>When considering the electricity distribution network, the revised pre-lodgement material indicates that Volt Advisory will hold a Special Approval under section 130 of the Electricity Regulation 2006. Exempt clearing work under Schedule 21, Part 1, item (10) of the Planning Regulation includes an activity under:</p> <p>(a) <i>The Electricity Act 1994</i>, section 101 or 112A; or</p> <p>(b) The Electricity Regulation 2006, section 17.</p> <p>If the distribution network meets the exemption identified in Schedule 21, Part 1, item (10) of the Planning Regulation, referral for vegetation clearing associated with the distribution network will not be required.</p>
5.	<p>Clearing vegetation in a category C or R area is not for a relevant purpose under the <i>Vegetation Management Act 1999</i>. Accordingly clearing of vegetation in these areas cannot be applied for under a development approval. Clearing vegetation in these areas must only occur as exempt clearing work or accepted development in accordance with an Accepted Development Vegetation Clearing Code (ADVCC). Clearing vegetation in category C or R areas that is not exempt or in accordance with an ADVCC is prohibited development. Information on exempt clearing work or ADVCCs is available online at www.qld.gov.au/environment/land/management/vegetation/clearing-options.</p>
Wetland protection area	
6.	<p>The proposed development is unlikely to be assessable development for operational work in a wetland protection area. The following provides additional information as to why:</p>

	<ul style="list-style-type: none"> If the proposed development does not involve high impact earthworks then referral for operational work in a wetland protection area is not required. High impact earthworks is defined in Schedule 24 of the Planning Regulation. An extract of the definition of high impact earthworks includes: <p><i>'High impact earthworks</i></p> <p>(a) <i>means operational work that changes the form of land, or involves placing a structure on land, in a way that diverts water to or from a wetland in a wetland protection area and involves excavating or filling –</i></p> <p>(i) <i>if the work is carried out in the wetland or within 200m of the wetland – more than 100m³; or</i></p> <p>(ii) <i>otherwise – more than 1,000m³; but</i></p> <p>(b) <i>does not include operational work - ...</i></p> <p>(i) <i>that is excavating to establish underground infrastructure, other than infrastructure for drainage or stormwater flows, if the excavated land is to be restored, as far as practicable, to its original contours after the infrastructure is established ...'</i></p> <p>(xii) <i>carried out under the Electricity Act, section 101 or 112A.</i></p> <p>(note: for the full definition of high impact earthworks, refer to Schedule 24 of the Planning Regulation).</p> If the proposed development involves high impact earthworks, in accordance with Schedule 7, Part 3, Item 9 of the Planning Regulation, operational work in a wetland protection area that is carried out for electricity operating works is accepted development. Electricity operating works means operating works under the <i>Electricity Act 1994</i>, section 12(3). It should be noted that to meet this exemption, the works need to comply with Schedule 14 – Requirements for high impact earthworks in a wetland protection area of the Planning Regulation.
Tidal works or works in a coastal management district	
7.	<p>The distribution network component of the proposed development will require referral for operational work that is tidal works or work in a coastal management district under Schedule 10, Part 17, Division 3, Table 1 of the Planning Regulation.</p> <p>The proposed development involves prescribed tidal works as the further pre-lodgement material indicates that cables associated with the electricity distribution network will pass over the tidally influenced Cooper Creek.</p> <p>Tidal works are works in, on or <u>above</u> –</p> <ul style="list-style-type: none"> land under tidal water; or land that will or may be under tidal water because of development on or near the land. <p>The boring or tunnelling under the bed of tidal water, if the works do not disturb the bed of the tidal water is not assessable development for prescribed tidal works. If the proposed works are expected to disturb the bed of tidal waters, referral of the development for prescribed tidal works will be required.</p> <p>Additionally, the proposed electricity distribution network will involve interfering with quarry material on state coastal land in a coastal management district as a result of infrastructure being</p>

	<p>located within road reserve in the coastal management district.</p> <p>State coastal land means land in a coastal management district other than land that is –</p> <ul style="list-style-type: none"> a) freehold land, or land contracted to be granted in fee simple by the State; or b) a State forest or timber reserve under the <i>Forestry Act 1959</i>; or c) in a watercourse or lake as defined under the <i>Water Act 2000</i>; or d) subject to a lease or licence issued by the State <p>Quarry material means material on state coastal land, other than a mineral within the meaning of any Act relating to mining. The definition makes specific reference to quarry material including stone, gravel, sand, rock, clay, mud, silt and soil unless it is removed from a culvert, stormwater drain or other drainage infrastructure as waste material.</p> <p>Any future application will be assessed against State code 8: Coastal development and tidal works (State code 8). Please refer to Guideline: State Development Assessment Provisions (SDAP) - State Code 8: Coastal development and tidal works for guidance on how to respond to State Code 8. The guideline contains information on how to respond to performance outcomes (PO) and outlines specific information requirements.</p>
Matters of State environmental significance (MSES)	
8.	<p>It is SARA's role to assess a development's impacts on MSES and determine whether the impact is acceptable.</p> <p>PO17 of State code 8 seeks to ensure that development avoids impacts on MSES or will minimise and mitigate impacts after demonstrating that avoidance is not reasonably possible.</p> <p>The proposed development may have an impact on the following matters are MSES under the <i>Environmental Offsets Act 1994</i>:</p> <ul style="list-style-type: none"> • conservation area, • wetlands, • wildlife habitat, and • regulated vegetation. <p>Any future development application must include sufficient information to demonstrate compliance with the avoid, minimise, mitigate and offset performance outcomes of the relevant State codes.</p>
Works in tidal waters (maritime safety)	
9.	<p>The revised pre-lodgement material indicates that works associated with the distribution network are not located in tidal waters and, based on this information, the proposed development will not require referral for works in tidal waters.</p> <p>Tidal water means –</p> <ul style="list-style-type: none"> (a) the sea and any part of a harbour or watercourse ordinarily within the ebb and flow of the tide at spring tides; or (b) the water downstream from a downstream limit as defined under the <i>Water Act 2000</i>.

Owner's consent	
10.	<p>Any works on premises that are below high-water mark will require owner's consent from the Department of Resources to lodge a properly made development application under the <i>Planning Act 2016</i>.</p> <p>For more information and to access the forms for owners consent please refer to the Department of Resources website (www.qld.gov.au/environment/land/state/owner-consent/).</p>
Lodgement material	
11.	<p>It is recommended that the following information is submitted when lodging/referring the application to SARA:</p> <ul style="list-style-type: none"> • DA Form 1 and planning report providing overview of the proposed works. • A full response to the relevant sections of SDAP. Based on the information provided the following state codes may be applicable to the proposed development: <ul style="list-style-type: none"> o State code 8: Coastal development and tidal works • Landowner's consent. • Relevant plans as per the DA Forms guide, showing: <ul style="list-style-type: none"> o Location of all infrastructure o Adjacent riverbanks, sandbanks, structures, the limit of vegetation and/or other principal features of the immediate area. o The level of HAT and MHWS. o Cross sections and longitudinal sections of any tidal works in relation to the existing features of the site. • A description of the work method (e.g. timing, equipment to be used). • A detailed description of how the development has been planned to avoid or minimise impacts to marine plants and other MSES through considerations such as design, location setbacks/buffer distances, construction and maintenance. • Details of on-site mitigation actions, during and after the development. • The extent of any future maintenance works required for the continued safe operation of the proposed development.
Other matters outside SARA's jurisdiction	
12.	<p>There may be requirements to obtain approval(s) for matters which sit outside the SARA's planning and development assessment framework. These potential approval requirements were identified in the pre-lodgement advice issued on 12 September 2022 relating to:</p> <ul style="list-style-type: none"> • <i>Environmental Protection and Biodiversity Conservation Act 1999</i> • Wet Tropics World Heritage Area • National parks • Protected plants • Potential road closure • Easements and authorities • <i>Water Act 2000</i> • Transport approvals <p>The advice provided relating to these matters in the previous pre-lodgement advice remains relevant to the proposed development and should be considered in determining the approval</p>

	requirements for the proposed development.
--	--------------------------------------------

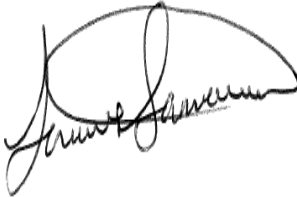
This advice outlines aspects of the proposed development that are relevant from the jurisdiction of SARA. This advice is provided in good faith and is:

- based on the material and information provided to SARA
- current at the time of issue
- not applicable if the proposal is changed from that which formed the basis of this advice.

This advice does not constitute an approval or an endorsement that SARA supports the development proposal. Additional information may be required to allow SARA to properly assess the development proposal when a formal application has been lodged.

If you require further information please contact Belinda Jones, Principal Planning Officer, on 40373208 or via email CairnsSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely



Javier Samanes
A/Manager (Planning)

Development details	
Proposal:	Daintree Micro Grid Project <ul style="list-style-type: none"> • Material change of use for solar farm • Reconfiguring a lot (lease > 10 years) • Operational works (prescribed tidal works and works in a coastal management district)
Street address:	Cow Bay
Real property description:	Electricity distribution network – various Solar farm - Lot 5 on BK157130
SARA role:	Referral agency
Assessment Manager:	Douglas Shire Council
Assessment criteria:	State Development Assessment Provisions (SDAP): <ul style="list-style-type: none"> • State code 8: Coastal development and tidal works
Existing use:	Various
Relevant site history:	Nil

Appendix B – Lease Plan Survey

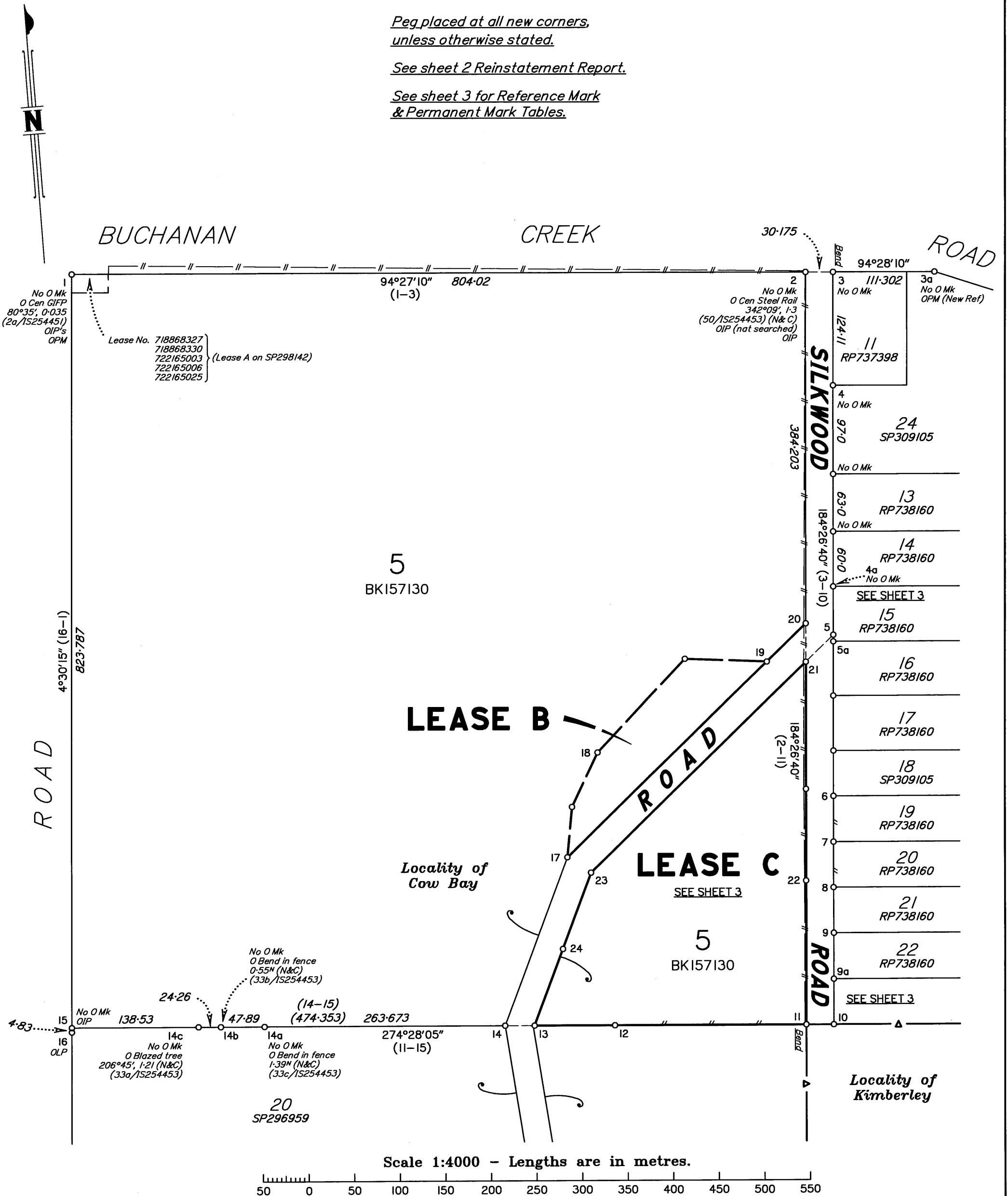
SURVEY PLAN

Sheet
1 of
3

Peg placed at all new corners,
unless otherwise stated.

See sheet 2 Reinstatement Report.

See sheet 3 for Reference Mark
& Permanent Mark Tables.



RPS AAP Consulting Pty Ltd (ACN 117 883 173) hereby certify that the land comprised in this plan was surveyed by the corporation, by Matthew James WILLING, surveying associate, and by Daniel Geoffrey PINKHAM, surveying graduate, for whose work the corporation accepts responsibility, under the supervision of Adrian Edward SOLOMON, cadastral surveyor, and that the plan is accurate, that the said survey was performed in accordance with the Survey and Mapping Infrastructure Act 2003 and Surveyors Act 2003 and associated Regulations and Standards and that the said survey was completed on 03/02/2023.

Adrian Edward Solomon
Authorised Delegate

22/02/2023

Date

LOCAL
GOVERNMENT: DOUGLAS SHIRE

LOCALITY: COW BAY

Meridian: MGA Zone 55 vide IS254453

Survey
Records: No

State copyright reserved.

Scale: **1:4000**

Format: **STANDARD**



SP340614

(Dealing No.)

4. Lodged by

(Include address, phone number, email, reference, and Lodger Code)

I. Existing		Created		
Title Reference	Description	New Lots	Road	Secondary Interests
21117005	Lot 5 on BK157130			Leases B & C

Leases B & C do not affect any of the leases lodged or registered against CT 21117005 dated 20/02/2023.

Reinstatement Report

Plans Searched: RP739768, IS254453, IS254451, RP738160, BK157130, BK157131 & RP737398.

Datum of survey is from stations 1–2 fixed by reference marks at these stations and resulting in distance in agreement with IS254453 (0.652m shortage compared to BK157130). This fix of station 2 being confirmed by connection to OPM at station 3a (reverse bearing error noted and checked from IS254453).

The boundary from stations 3 – 10 has been fixed by OIP at station 10 (which appeared to be undisturbed) resulting in angle down 0°0'30" at station 3 compared to deed plan BK157130 and 0.786 shortage compared to BK157130 & RP738160 & RP737398. The fix of station 10 via the OIP supported by reasonable agreement to adjacent star picket remains off 10 & 11. Steel star pickets were used as corner marker posts throughout the majority of Cow Bay subdivision surveys. In addition, the occupation from station 11 – 12 agrees well with the fix of station 10.

We note that whilst 0.786 shortage has been observed from 3–10, deed distance can be left in the front of all lots fronting Silkwood Road as the southernmost lot (23 on RP738160) has been cancelled and absorbed into the balance lot 20 on SP296959.

From review of occupation from stations 5a–10 and OP at station 5a, it appears that the shortage lies between stations 9 & 10 thus deed distance has been maintained from stations 3–5.

The bearing from stations 5–23 has been fixed by maintaining deed angle at station 21. The fix of station 20 and bearing to station 17 has been fixed by maintaining 150link road width.

The boundary from stations 10–11 has been fixed by maintaining RP738160 angle & distance & resulting in parallel road frontage of Silkwood Road from stations 11–2.

The boundary from stations 11–15 has been fixed by OIP at station 15 & O Line Peg at station 16. This fix resulting in angle up 0°01'25" and 0.2m excess compared to deed plan BK157130.

Station 14 has been fixed by maintaining deed distance from station 11. The boundary from station 14–17 has been fixed by maintaining deed angle at station 17 resulting in 0.787m shortage compared to BK157130. The resulting boundary from stations 17–20 being 0.227m excess compared to deed BK157130.

The boundaries from stations 13–23–21 have been fixed by maintaining fixed 150 link road width.

The observed bearing from stations 15–1 being in agreement with IS254453. The distance from station 15–1 measured 0.487m excess compared to IS254453 and 1.404m shortage compared to BK157130.

Lots	Orig

2. Orig Grant Allocation :

3. References :

Dept File :
Local Govt :
Surveyor : AU213008233

5. Passed & Endorsed :

By : RPS AAP Consulting Pty Ltd
Date : 22/02/2023
Signed : Solomon
Designation : Cadastral Surveyor

6. Building Format Plans only.

I certify that :
* As far as it is practical to determine, no part of the building shown on this plan encroaches onto adjoining lots or road;
* Part of the building shown on this plan encroaches onto adjoining* lots and road

Cadastral Surveyor/Director* Date
*delete words not required

7. Lodgement Fees :

Survey Deposit \$
Lodgement \$
.....New Titles \$
Photocopy \$
Postage \$
TOTAL \$

8. Insert Plan Number SP340614

REFERENCE MARKS

STN	TO	ORIGIN	BEARING	DIST
1	OIP	2a/RP739768	4°21'	1.0
1	Screw in Concrete		333°55'15"	18.518
1	OIP	32/IS254453	183°29'	51.45
2	OIP not searched (under rock stockpile)	50/IS254453	229°09'10"	45.68
2	OIP	50/IS254453	264°30'50"	47.877
3	Spike in Bitumen		304°28'	13.723
5	Pin		308°26'40"	23.013
10	OIP	30a/RP738160	94°27'20"	0.992
11	Pin		55°30'	14.81
12	Pin		24°23'	2.345
13	Pin		213°46'30"	6.505
13	ORT gone	7a/BK157130	200°00'05"	6.84
14	Pin		138°0'	5.208
14	ORT gone	7/BK157130	201°34'05"	6.035
14a	Pin		309°59'	19.624
15	OIP	33/IS254453	216°58'	17.95
17	Pin		350°08'	1.091
17	ORT gone	6/BK157130	37°26'40"	6.035
18	Pin		100°24'30"	17.572
19	Pin		95°32'	1.055
21	Pin		19°18'	1.885
23	Pin		301°09'	1.206
23	ORT gone	6a/BK157130	109°11'40"	2.655
24	Pin		138°33'	1.336

PERMANENT MARKS

PM	ORIGIN	BEARING	DIST	NO	TYPE
1-OPM	32/IS254453	295°15'30"	32.5	71626	
3a-OPM	24/RP737398	312°32'20"	1.7	74788	

N&C
New Ref, N&C



SEE SHEET I

Peg placed at all new corners,
unless otherwise stated.

5
BK157130

LEASE B
1.438 ha

ROAD

LEASE C
7.181 ha

Locality of
Cow Bay

SILKWOOD

ROAD

14
RP738160

15
RP738160

16
RP738160

17
RP738160

18
SP309105

19
RP738160

20
RP738160

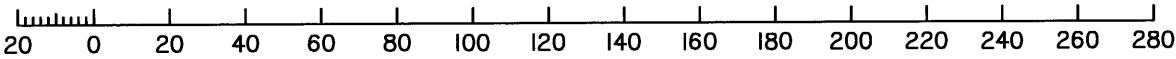
21
RP738160

22
RP738160

Locality of
Kimberley

SEE SHEET I

Scale 1:2000 - Lengths are in metres.



State copyright reserved.

Insert
Plan
Number
SP340614

Appendix C – Owners Consent

- **Dennis Verri, owner Lot 134 Buchanan Creek Road**
- **Department of Resources**

Individual owner's consent for making a development application under the *Planning Act 2016*

I, Dennis James Verri

as owner of the premises identified as follows:

174, Buchanan Creek and Silkwood Road, Cow Bay

QLD 4873

consent to the making of a development application under the *Planning Act 2016* by:

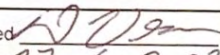
Volt Advisory Group Pty Ltd.

on the premises described above for:

Reconfiguration of a lot (by lease agreement > 10 years), Material Change of Use, and Operational Works for the construction and operation of solar generation facility of 7.9MW capacity on the said premises.

Signed

Date


27-6-2023



10 July 2023

Environment Pacific Pty Ltd
Attn: Andrew Small
PO Box 724
Edgehill QLD 4870

Department of Resources

Email: andrew.small@environmentpacific.com

Dear Andrew

Application for Owners Consent – Material Change of Use Application for Operational Works for Construction and Operation of an 8 MW Electrical Generation (Solar) Station.

Reference is made to your request dated 29 June 2023 for owners consent required to accompany the development application for a material change of use over part of unnamed road located within Lot 5 on BK157130 for electricity cables to be installed beneath the road area as part of the Daintree Microgrid Project involving the construction and operation of an 8MW electrical generation (solar) station on the adjoining freehold described as Lot 5 on BK157130.

The department hereby gives owner's consent as the owner to accompany the development application for the purpose of section 52(2) of the *Planning Act 2016* for a material change of use over part of unnamed road located within Lot 5 on BK157130 for electricity cables to be installed beneath the road area as part of the Daintree Microgrid Project involving the construction and operation of an 8MW electrical generation (solar) station on the adjoining freehold described as Lot 5 on BK157130.

Although owner's consent to the development application has been provided and no tenure under the Land Act is required, your client is to undertake works on the land only if and when the development or change application has been approved by the assessment manager or responsible entity, and in accordance with the conditions of that approval.

A copy of this letter is to be attached to your client's DA Form 1 as the required evidence of owners consent.

Your client will also need to comply with all other legislative and regulatory requirements which may also include approvals that are not part of the assessment of the change application under the *Planning Act 2016* e.g. a marine park permit if in a marine park.

Further, please note that the above consent will expire on **10 January 2024**. Should the development application not be lodged with the assessment manager prior to this date, your client will be required again to lodge the DA Form 1 and any attachments with this Department with a further request for owner's consent - any further request will need to be reconsidered by the Department.

It is also advised that any land use activities must comply with the *Aboriginal Cultural Heritage Act 2003* or the *Torres Strait Islander Heritage Act 2003*.

Finally, owner's consent is required under the *Planning Act 2016* to enable the application to be considered properly made for lodging with the assessment manager and is a completely separate process to assessment of the application under the *Planning Act 2016*.

Accordingly, the State may act at a later date as assessment manager in the assessment of the change application - providing owner's consent will not influence any role the State may have in this development assessment.

If you wish to discuss this matter please contact Gerry McDonald on (07) 4222 5427.

All future correspondence relative to this matter is to be referred to the contact Officer at the address below or by email to lasslsteam1enq@resources.qld.gov.au . Any hard copy correspondence received will be electronically scanned and filed. For this reason, it is recommended that any attached plans, sketches or maps be no larger than A3-sized.

Please quote reference number **2023/002294** in any future correspondence.

Yours sincerely



Deanna Holder

A/Manager

A duly authorised delegate of the Minister
under the current Land Act (Ministerial) Delegation

Appendix D – Technical Description



Volt Advisory

Development Application **Supporting Information**

Technical Descriptions

October 2023



environmentPACIFIC

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1. Introduction

1.1 Supporting Information Report

This report provides supporting information for the Daintree Microgrid (DMG) project with respect to supporting a Development Application (DA) to the Douglas Shire Council.

This Technical Description is for the construction and operation of a hybrid solar/hydrogen power generation plant to be located in Cow Bay on Lot 5 BK157130.

It identifies the components of the DMG project, outlines the potential matters of social / environmental significance and identifies key mitigating mechanisms to be employed, noting that details of these measures are contained within the DMG project Environmental Management Plan (EMP) Appendix G of the DA Planning Report.

The associated cable distribution network within the road reserves between (and including) Cow Bay to Cape Tribulation is not part of this DA.

1.2 Daintree Microgrid Project Overview

The Daintree Microgrid Project (DMG project) involves the construction of an 8 megawatt (MW) solar farm in Cow Bay and associated underground distribution network of approximately 56km of road reserve between Cow Bay and Cape Tribulation. Approximately half of the solar farm output will directly contribute to community electricity consumption, 40% will charge the 20 Megawatt hour (MWh) battery energy storage and 10% will charge the hydrogen storage system. There will be a Jenbacher hybrid fuel hydrogen/liquified petroleum gas (LPG) powered backup generator.

The cable distribution network (not part of this DA) is entirely underground, to be installed via trenching or horizontal directional drilling (HDD) and will require no native vegetation removal.

The design, layout, and operational parameters of the solar farm have been similar to those developed through collaboration with CSIRO and Arcadis, and now operational in remote mining centres, Aboriginal communities in Queensland (through Ergon Energy remote support program), and are now under consideration by Torres Strait Island Regional Council (TSIRC) for remote islands in the Torres Strait to remove reliance on diesel sole supply energy sources. The technology has been significantly advanced in the last five years, and the solar/hydrogen energy generation concept is now an established operational / technically viable technology. A detailed technical description of the solar farm is included in this Technical Description document.

CSIRO have been engaged throughout the DMG project design through their HyResource program¹ and are a collaborator in this project.

1.3 Project Background

1.3.1 Feasible and Alternative Options

The DMG project is the outcome of a number of studies, reports and surveys that have investigated, assessed and offered opinions and recommendations as to the effects of introduction of mains electricity into the Daintree freehold areas, the nature of the generation facility, locations and modes of distribution. This exhaustive list of studies began with the original Far North Qld Regional Electricity Board (FNQEB) investigations in 1988 - 1992, with the most recent being the Queensland Department of Natural Resources Mines and Energy *Daintree Electricity Supply Study* (2019). It is beyond the

¹ <https://research.csiro.au/hyresource/daintree-microgrid-project/>

scope of this DA to review, comment and reassess on the findings and recommendations of over 30 years of reports with respect to the DMG project.

The DMG project is the recipient of a Commonwealth grant through the Regional and Remote Communities Reliability Fund. The grant assessment process by the Commonwealth was undertaken over a period of 16 months and was awarded in March 2022. The grant assessment was commercial-in-confidence and Volt Advisory Group (VA - the project proponent) were not privy to the discussions on options / alternatives / design during the assessment period. The awarded grant was conditional on a number of factors which included:

- a) There is no “do nothing” option available for the DMG project. Funding conditions require the delivery of the assessment, design and implementation of a single reticulated option (see below).
- b) The grant funding conditions (not available for this application) identify a single generation source, with distribution network that is compatible with maintaining the natural and cultural values of the Daintree.
- c) The project is to apply to freehold areas north of the Alexandra Range only. It does not include reticulation of electricity supply to the Forest Creek/Cape Kimberley areas.

Multiple generation and distribution models have been identified in nearly all reports and studies and (presumably) were assessed during the grant assessment period and a single option presented to VA for implementation. The single generation source and grid reticulation option was presented in the Sunverge Report (2018), but was not assessed as an option in the DNRME (2019) report. VA as noted, were not privy to the assessment of options during this process and are obligated to deliver the single option presented in the grant: *vis a vis*: a single generation source with underground reticulation to eligible consumers (i.e., properties with existing legal development rights) north of the Alexandra Range.

1.3.2 Facilitative Development Impacts

The issue of mains supplied grid electricity promoting further development in the Daintree has remained of public opinion/interest since the original subdivisions in 1982. Subsequently almost every electricity supply investigation has examined this aspect. A key aspect of these investigations has been the identification of development thresholds beyond which biodiversity values of the area would be compromised, and the subsequent requirements on controls that would:

- a) Protect and enhance the biodiversity values of the freehold developments.
- b) Provide an equitable method of electricity supply to residents/businesses in the affected areas.

Key thresholds identified beyond which a grid reticulated electricity supply option should be considered included:

1. Planning controls on development are enacted by Douglas Shire Council under the town planning scheme.
2. Power supply and reticulation is of minimal environmental impact (e.g. underground), without the requirement for infrastructure linear severance impacts (i.e., clearing for overhead powerlines).
3. Acquisition of high biodiversity important properties within key ‘hot spot’ precincts (e.g. Cooper Creek enclave of Turpentine and Stonewood Roads) into tenure secured conservation reserves or agreements exceed the number of available remaining developable properties.

It is beyond the capacity and relevance of this Technical Description report to fully revisit 30 years of study/reports with respect to various assessment of options and derivations of the above key thresholds. These thresholds however, have been considered by both the Commonwealth, under the

provisions of the *Environment Protection and Biodiversity Act 1999*, and the Qld government under the *Wet Tropics Plan 1998*.

The Commonwealth concluded that the DMG project, including consideration of facilitative impacts, has no “significant impact” on any Matters of National Environmental Significance (MNES, including World Heritage Values), and the DMG project was deemed to be “not a controlled action” (without conditions) on 22nd December 2022. The Wet Tropics Management Authority (WTMA) issued a permit for the DMG project within Zone C of the Wet Tropics World Heritage Area (WTWHA) on June 19th 2023, also concluding that the DMG project had minor and inconsequential impacts (including facilitative impacts) on World Heritage values.

1.3.3 Impacts of the DMG project on development pressure

Within the context of the DMG project as a whole, the assessment agencies concluded that the DMG project will not have quantitative facilitative impacts on any WTWHA values with respect to the promotion of further development in the DMG project area. The reasons for this conclusion can be summarised as:

- a) Existing development drivers/limitations will continue to remain in the DMG project and are independent of the DMG project.
- b) All original planning precepts that were to be achieved prior to grid electricity being reconsidered have been met. This includes introduction of planning controls (DSC 2006) and adoption of an environmentally sensitive design (VA, this project).
- c) With respect to acquisition of biodiversity important properties: The key precept broadly acknowledged in planning reports is that the properties acquired for conservation purposes must exceed the number of available remaining developable properties before the introduction of grid reticulated electricity could be considered. Figures adopted by assessment agencies identified that approximately 12% of the freehold lands north of the Alexandra Range remain developable, and 44% of the freehold land has been either acquired for conservation purposes and/or has conservation management controls. The majority of the remaining developable properties are within lower biodiversity areas of Cow Bay. Within the higher biodiversity areas, Diwan/Cooper Creek catchment for example, only approximately 4% of the remaining lots can be developed, with >50% of the freehold in some type of conservation management tenure. Cape Tribulation has the highest rate of development of freehold lots, and is the only locality (excluding the pre-1982 existing Thornton Beach enclave), where land acquisition for conservation purposes does not exceed the available developable land. However, if land in other conservation management tenures, e.g. nature reserves is taken into account, then conservation lands in the Cape Tribulation do exceed the available developable land.

Additionally, there are two other important limitations on the capacity of the DMG project to promote facilitative development. These include:

1. Conditions from the Australian Energy Regulator (AER) under the National Energy Retail Law (NERL), s. 110 which sets the “obligation to supply” framework, have been formalised between VA and the AER. This includes the acknowledgement by the AER that the DMG project is exempt from:

.Condition 1 – Obligation to supply

The obligation to supply does not apply to new customers or existing customers who seek to significantly increase their electricity load.

Significantly, the DMG project commitment to ‘obligation to supply’ is to existing lawful developments (private and commercial) with development (commercial/residential) as approved through the Douglas Shire Council Planning Scheme. ‘Obligation to supply’ under the NERL

does not extend to undeveloped properties without development approvals, or allow potential existing businesses/residences to increase their electricity load (e.g. Air B n B adding extra accommodation with air-conditioning etc). .

2. DMG generation limitation: The DMG project solar generation capacity is limited by the available solar array area (which cannot be expanded), the nature of the technology (solar/hydrogen hybrid), and the length of the distribution network (56km of road reserves – not part of this DA). Generation capacity is 7.9mW, with the equipment being Tier 1, and the project system allows for N+1 reliability with backup capacity. “N+1” means that the system (at central generation site) is capable of experiencing outage of it’s generation system without causing loss in electricity supply. The allowance for N+1 reliability is based on existing customer forecast and does not include further connections or increases in electricity load for: a) undeveloped properties without development approvals (either residential or commercial), or allows b) approved developments to increase their electricity load. The DMG project generation site has been developed in conjunction with the CSIRO HyResource project².

2. Technical Infrastructure – Solar Farm Generation Site

2.1 How does a solar/hybrid generation site work?

Hydrogen is a low-density gas which produces clean electricity and emits only water. This is widely considered to be a “green” energy source and is a primary reason why this technology was adopted for the DMG project as a cost-effective, dispatchable power source.

As a hybrid energy generator, the process starts with the electrolysis of water, where electricity from the solar farm is used to split water into oxygen and hydrogen gas. The hydrogen that is produced is then pressurised and stored. To create electricity, the hydrogen gas is passed through a fuel cell and combined with oxygen.

The reaction between the two gases produces electricity which is stored in a battery energy storage system (BESS - which is then supplied to the grid) and water vapour. The water vapour is reused at a rate of approximately 50% and the balance evaporates into the atmosphere.

Approximately 40% of solar energy generated will be directly fed into the grid network and 60% used for the electrolysis process.

2.1.1 General layout and energy flows

As a 100% renewable microgrid, the generation station will comprise a solar farm, battery energy storage system, containerised electrical switchgear on raised platforms, and a containerised hydrogen electrolyser and fuel cells.

The combination of solar generation, battery and hydrogen storage will ensure that sufficient energy is captured and stored to get the community through periods of low solar production, typically the wet season December to April.

² <https://research.csiro.au/hyresource/daintree-microgrid-project/>

Figure 1 Overview - simplified power flow process

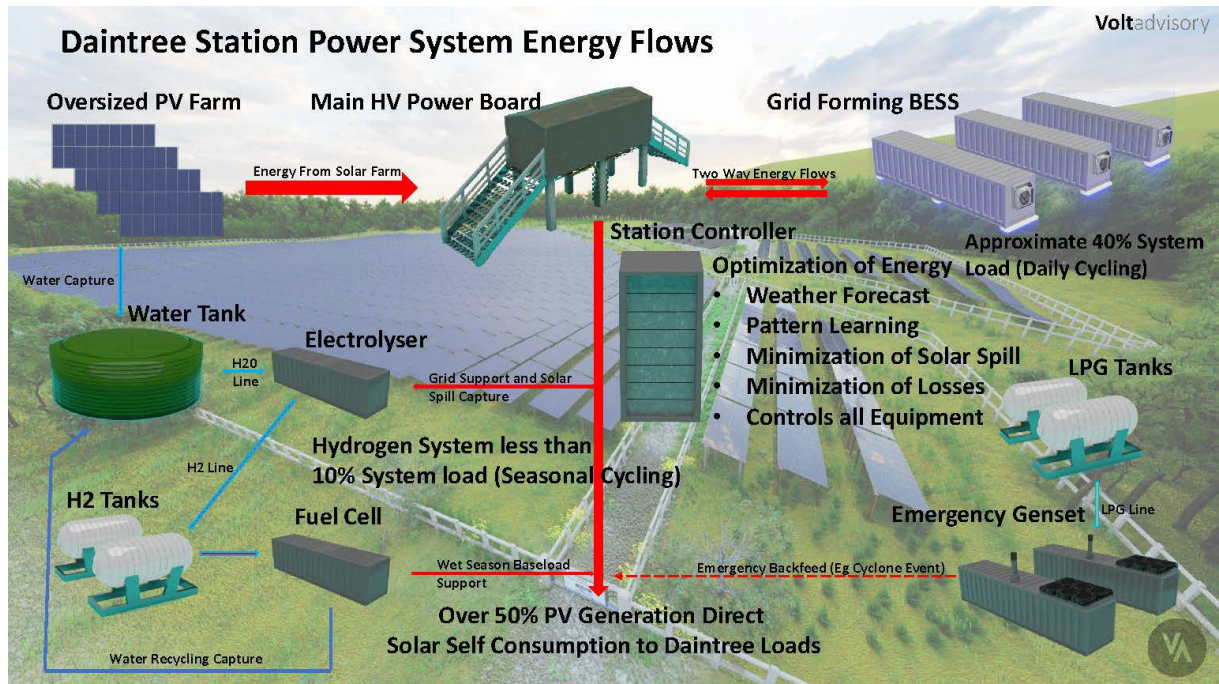
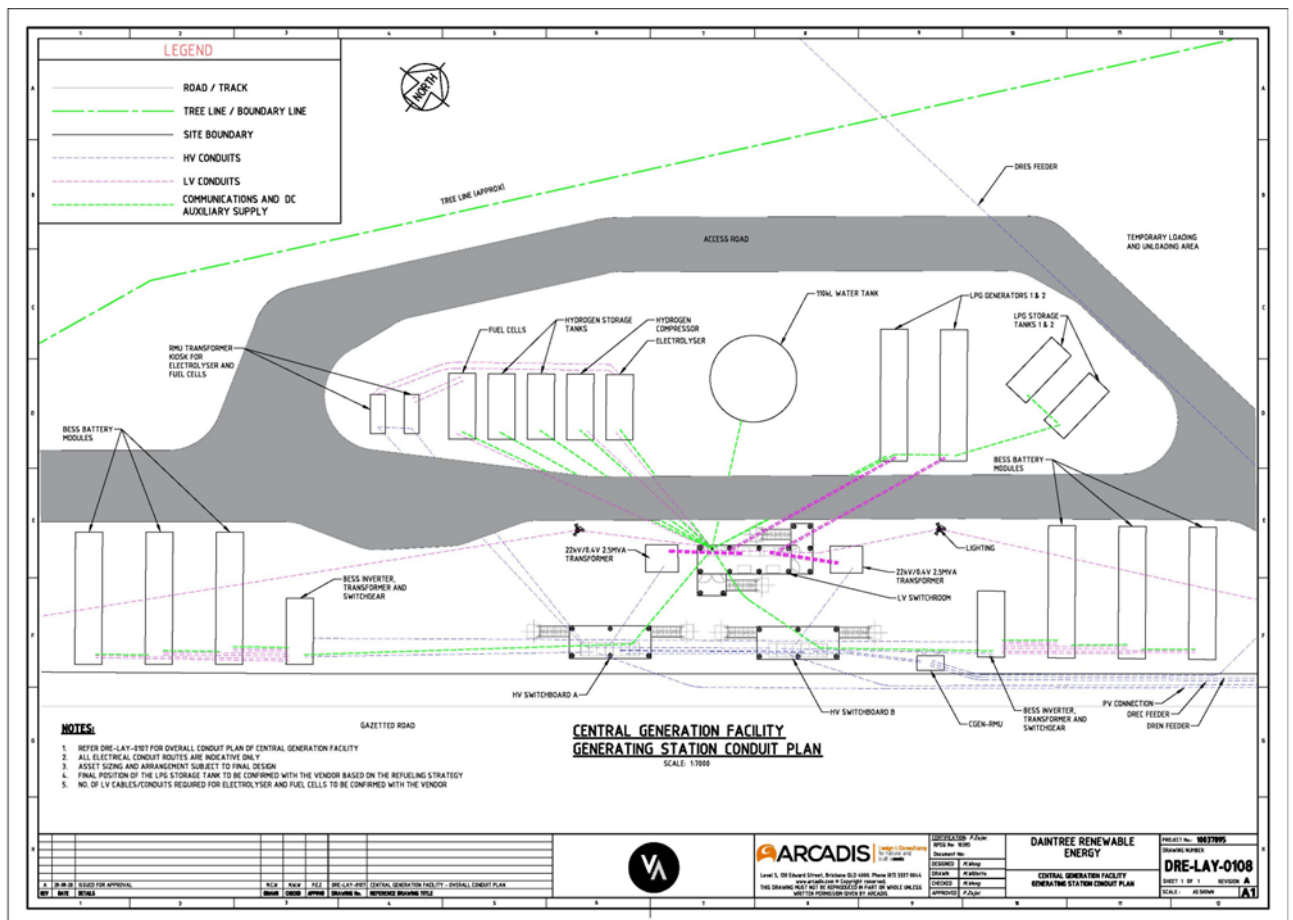


Figure 2 Typical Layout (indicative design), solar farm component layouts



Above is preliminary layout for the central generation site on the western side of the lease bordering the Buchanan Creek tree line which screens the site off from the rest of the cattle farm. The switchgear platforms are arranged so that if an operator is at site and needs to perform any switching action, they

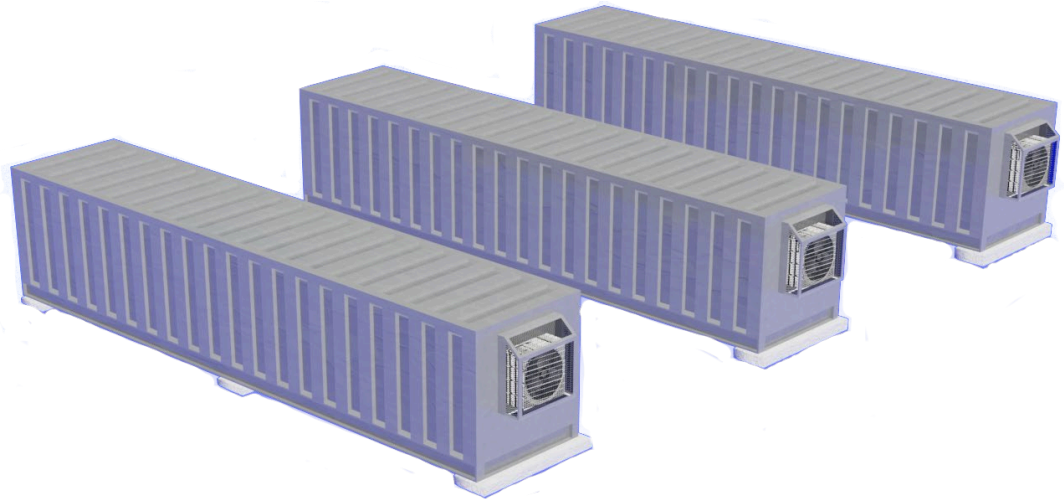
can do so by using powered switches at a distance from the physical operation but will still be able to see all equipment within one centralized physical location.

2.2 Battery Energy Storage System

The battery energy storage system (BESS) selected will be capable to provide dynamic short-term voltage and frequency stability (grid forming) functionality, virtual inertia, fast frequency response and fault current contribution (up to 2 x inverter MVA rating for 1 second) for the microgrid. As a voltage source inverter, the BESS selected has the capacity to meet the stability requirements while delivering energy for significantly longer periods. Of particular importance is managing solar shortfall from rapid cloud movement, where a combination of cloud prediction techniques, load management and BESS operation can absorb or release energy rapidly.

The required BESS capacity is 4MW/20MWh (Inverter rating = 4 MW, Battery size = 20 MWh). The BESS will be a containerized or OEM equivalent enclosure where the systems are bolted onto pontoon foundation platforms as shown in the following.

Figure 3 Rendering of containerised BESS



The cell chemistry chosen is Lithium Iron Phosphate (LiFePO_4) - LiFePO_4 cells are less susceptible to thermal runaway events compared to other lithium ion battery chemistries that contain cobalt. Subsequently LiFePO_4 cells used in the DMG project are significantly harder to overheat in the event of mishandling, and as such the lower risk is considered one of the major advantages over other lithium chemistries. Additionally, since there is no cobalt, these are more environmental and ethical than other chemistries when consideration is taken into the global effect of cobalt sourcing and processing methods.

All battery energy storage systems will be tier 1 providers, with multiple redundancies implementing modern battery management systems with regards to monitoring and control cell voltages, temperatures, state of charge, charge/discharge rates etc and thus mitigating thermal events to very low probability, this combined with the safety factor of LiFePO_4 cells make for a very safe BESS.

2.3 Station Switchgear

As per the distribution (RMU) switchgear all HV station equipment is 22,000V containing no oil/pitch and will be gas insulated supplied by a tier 1 provider like Siemens or ABB. This switchgear will however be full height approximately 1.8m as it will contain all the voltage transformers, relays, and control systems typical of primary switchgear.

Figure 4 Rendering of raised switchgear platforms

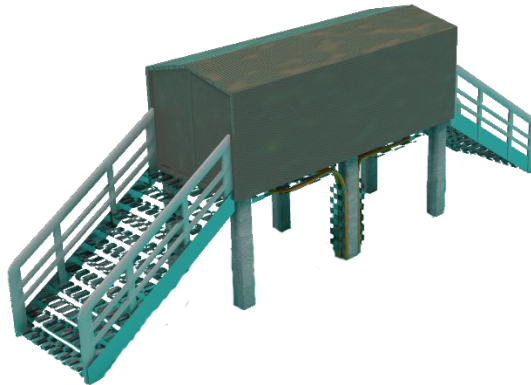
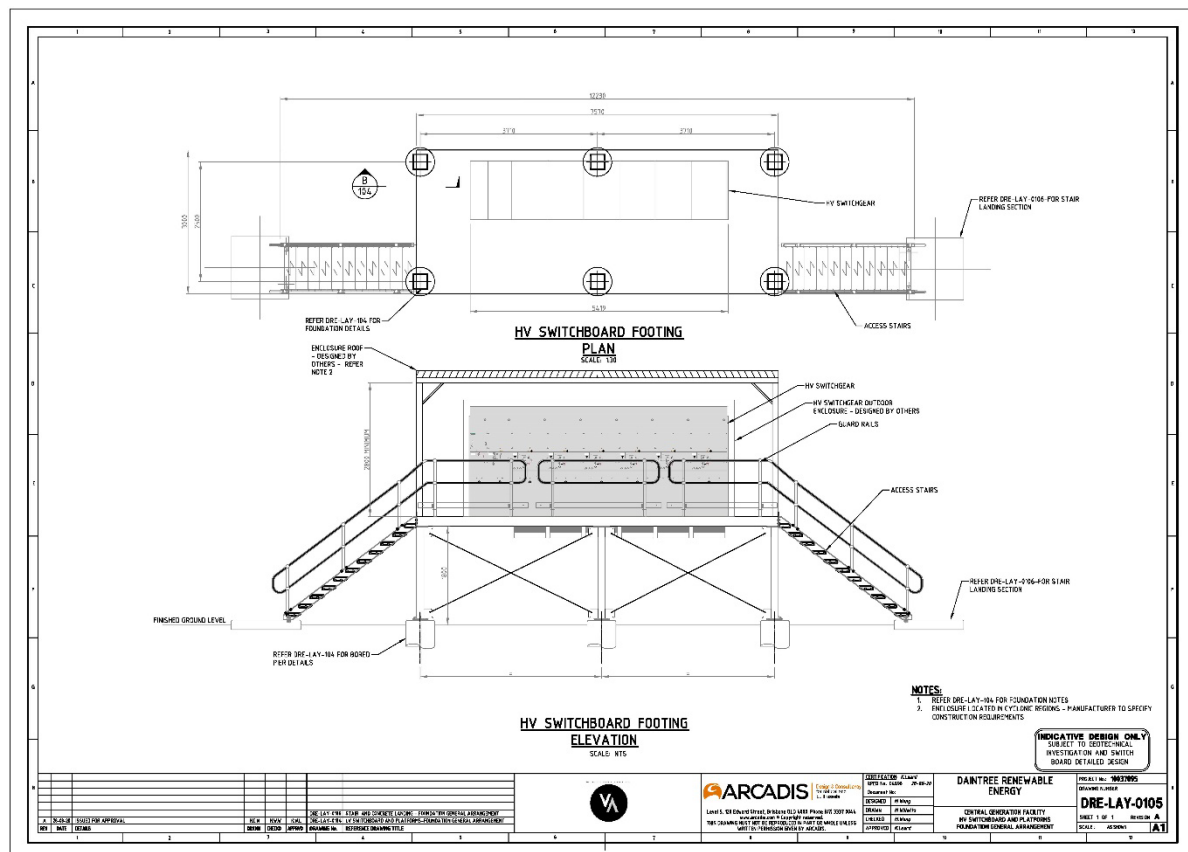


Figure 5 General arrangement (preliminary) of switchgear platforms



2.4 Hydrogen System

The DMG project hydrogen system uses an electrolyser, fuel cells, hydrogen tanks and a water storage tank. Except for the water storage tank, the other equipment is containerized or housed within original equipment manufacturers (OEM) enclosures of a similar design.

- Electrolyser approximately 1.3MW
- Fuel Cells approximately 600kW
- Hydrogen Storage tanks approximately 500kg of hydrogen storage
- Water Tank approximately 110,000 litres.

2.4.1 Electrolyser

The electrolyser to be used on site is a Proton exchange membrane also called polymer electrolyte membrane (PEM). This is a proven technology which contains solid state stacks unlike alkaline water electrolysis systems where an alkaline electrolyte is present and thus the later system has a higher environmental risk in case of a failure.

The chosen PEM electrolyser will act as a very fast dispatchable load to soak up the rapidly fluctuating solar peaks, with system able to increase or decrease most of its load (splitting water into hydrogen and oxygen using excess solar energy) within seconds.

The DMG project is capturing rainwater via the PV arrays and recycling fuel cell exhaust water. As such the content of dissolved ions within this water stream is expected to be very low. PEM systems are very sensitive to poisoning due to contaminants, as such there will be a filtration system that filters out particles, ions via a reverse osmosis filter. Depending on water purity it is expected that rain water captured will be very pure and any waste/exhaust water from the fuel cells (PEM) will effectively be indistinguishable from rain water.

An additional benefit is that the capture of rainwater by the PV arrays limits the impact of overland flow on the ground surface and generally contributes to efficient site drainage.

The two main hazards for PEM Electrolysers are hydrogen leaks and over-pressurisation.

The systems will have gas detectors mounted on the roof of the containerized system to monitor any leaks of hydrogen. Hydrogen very rapidly disperses and unlike heavy gasses will accumulate on ceilings rather than floors. Since hydrogen quickly disperses it also rapidly reduces the fuel air ratio to below the ability for combustion. Automated system pressure hold tests will be done daily, such tests are held at a certain pressure and are able to very quickly determine if there is a leak including very small ones. During operations pressure will be continuously monitored and if any pressure drop/increase is detected an automatic shutdown will occur. There will be mechanical pressure relief valves within such a system which would vent hydrogen to a safe location outside the enclosure as a final backup.

The electrolysers will be located within containerised structures and will be mounted above ground on support pads.

Figure 6 Typical containerised hydrogen electrolyser



2.4.2 Fuel Cells

The fuel cells (600kW) to be chosen are of a similar technology to the electrolyser being a proton exchange membrane (PEM) system. The function of this system is to reduce the energy demands off the solar generation system over the corresponding wet season period with the aim of providing baseload removal at night during the wet season and thus operating the fuel cells at their peak efficiency.

The fuel cells waste emissions are pure water, this waste stream will be collected and stored in the water collection tank system for use by the electrolyser system.

2.4.3 Hydrogen Storage Tanks

The hydrogen will be stored in high pressure composite tanks, these tanks will be arranged inside a containerised solution. These tank systems are similar to those implemented for transport solutions such as public bus networks and as such are extremely durable and can handle many thousands of pressurisation cycles before they need to be replaced.

In total there will be slightly less than 500kg hydrogen storage capacity on site. This has been determined by the State Assessment Referral Agency and Department of Environment and Science as not constituting a Environmentally Relevant Activity (ERA) and does not require an Environmental Authority.

Below shows a typical storage arrangement (not in a container) as used on public buses and similar to what will be employed for the hydrogen storage at the solar farm (albeit in fauna proof enclosures).

Figure 7 Typical low volume hydrogen storage



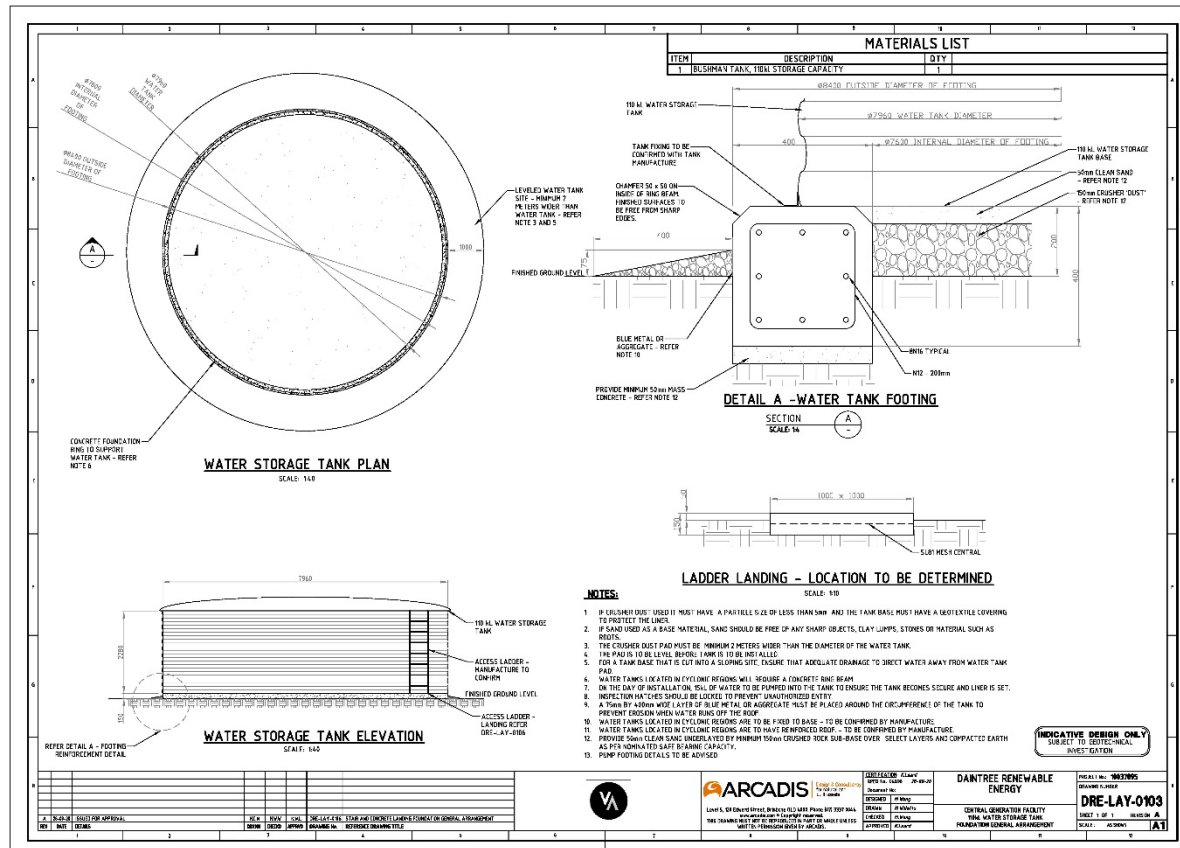
2.4.4 Water Tank

The water tank will store the required water needed for the electrolyser and is oversized to allow for a smaller collection area (buffering out variability in rainfall). Water is to be collected via the PV array using two or three rows. As rainfall is much higher during the wet season, the tank also needs to be of sufficient size to ride through the dry season which is when the electrolyser demands on the stored

water will be higher. To help assist in collecting rain water the water tank itself will contain internal guttering to also act as a collection vessel.

The actual tank itself is approximately of 110ML, and is constructed to industry standards relevant to cyclonic environments.

Figure 7 Indicative water tank design



2.5 Emergency Backup Generators

The DMG project is located within a per-humid tropical zone where the UV reliability fluctuates seasonally, and cyclones can create hazardous environmental conditions which can damage PV panels, and create extended periods of low UV reliability.

While the solar arrays proposed to be used are extremely sensitive and represent a quantum leap in efficiencies by comparison with similar arrays, the DMG project has understood the unique climatic risks in the area and will employ emergency backup generators.

There will be two emergency backup dual fuel (hydrogen and LPG) Jenbacher generators totalling approximately 2MW housed on site, these are fully containerised solutions including all sound dampening, cooling etc. The Jenbacher generators will use hydrogen stored as the primary fuel when this is available, and switch to LPG gas only when there is insufficient hydrogen produced during the electrolysis process.

The generators prime mover is a reciprocating dual gas engine, this will turn the generator which will produce 400V AC electricity, this is then connected to the LV board from there it will be stepped up to 22,000V AC via two 2.5MVA dry type transformers onto the main HV Board.

These generators are emergency backup systems only, and will only be used in such situations. The emissions from Jenbacher generation systems, when using hydrogen, is water vapour. LPG use is not desirable, however carbon emissions from LPG fuel has the lowest carbon content of any

commercially available fuel sources and these systems are not expected to be run on anything other than a very intermittent manner and for limited duration each year.

Figure 8 Typical dual fuel (hydrogen/LPG) Jenbacher generator



2.6 Solar PV Arrays

The PV arrays farm will generate approximately 8MW with the PV panels arranged in a configuration of 7.5kW per string/array (exact size dependent on solar panel chosen and system voltage of PV inverter either 1000V or 1500V DC).

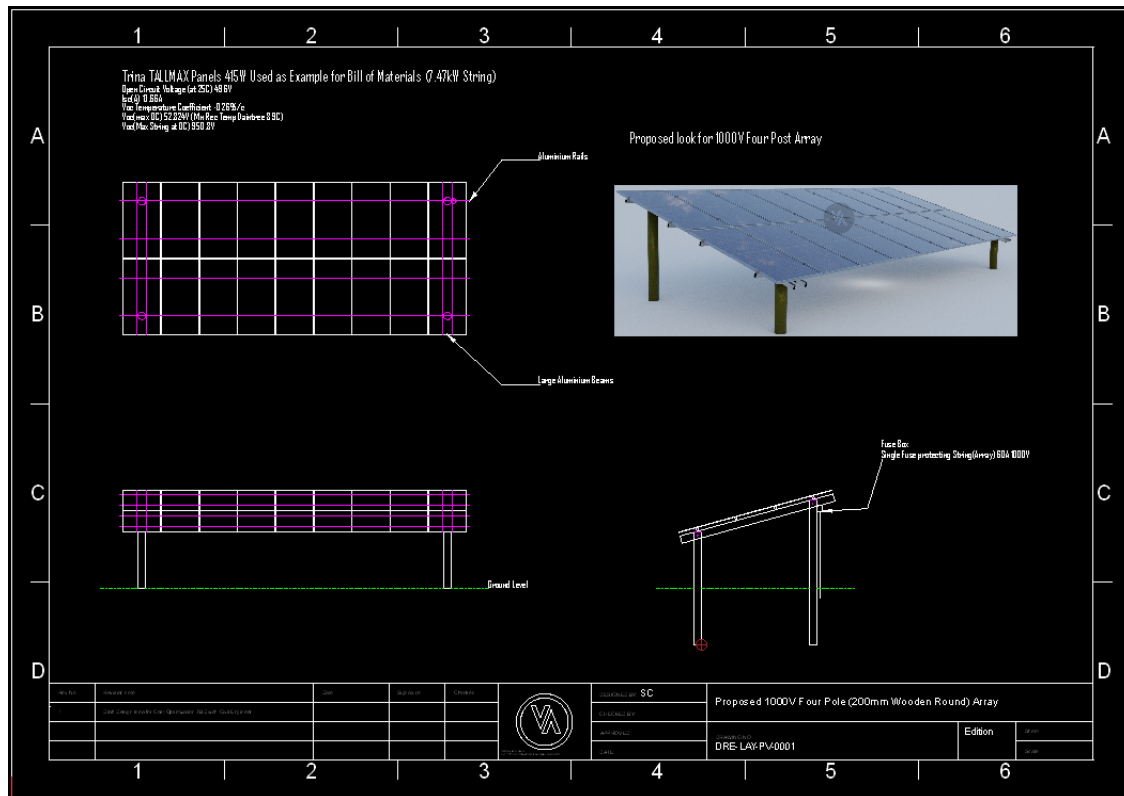
The arrays will be facing north (azimuth of approximately 5 degrees) with a tilt angle of 16 degrees, the arrays will roughly follow the ground contours at site which are generally flat across the site but with an advantageous increasing north facing slope lengthways along the site. The panel height on average is targeted for approximately 2.6m - 1.5m (top panel edge to bottom panel edge, string arrays consist of two rows of panels in portrait orientation, note in some locations height may differ due to localized ground contours, ditches for example, Geotech will determine exact height of system and foundations needed for corresponding wind loading).

The panels frame foundation is targeted to be either to be piled driven or soil drilled into the site and thus cause minimal disturbance to the site during construction.

The PV arrays are PV solar panels are designed to have low levels of reflectivity enabling as much light as possible to be absorbed thereby increasing electricity production and efficiency. To limit reflection, PV panels are constructed of dark, light absorbing materials and may be covered with an anti-reflective coating. The metal frames and mounting structures for panels may have glint and glare impacts, although these components are usually covered by the solar panel itself or limited to a small surface area.

In addition to their PV function, the solar panels also act as rainwater collecting mechanisms to provide the raw water source for the main water storage tank feeding the electrolysis process. The use of the solar panels to collect water also has an added benefit in contributing to site drainage and runoff management.

Figure 9 Conceptual sketch of PV panel array.



Note* The four posts shown for the arrays may be replaced by a single post and frame support, depending on slope and individual panel properties.

The following figure is a general preliminary layout of the site including solar arrays. Blue line is the 20m boundary from the surveyed regulated vegetation Category B boundary (purple line). Only fences and access tracks are within the 20m boundary

A driveway accessway with a minimum width of 4m (Access Roadway Entrance) will be fully gated with gates and access off Silkwood Road. This driveway links both discrete sections of the site together. The edge of the photovoltaic panel arrays are over 20m from the Silkwood road formation, with main station equipment being nearer to 150m away from Silkwood Road edge. All infrastructure is located >20m from the edge of the Category B regulated vegetation and complies with the requirements of the *Vegetation Management Act 1999*, and *Planning Regulations 2017*.

3.1 Natural heritage values

Ecologists and botanists surveyed the entire DMG project area between 2021 and 2022 with over 4 weeks of on ground surveys that included the solar farm generation site and the road reserve network. The purpose of the surveys was to inform the DMG project design team of the locations of sensitive receiving environments such that appropriate design and construction methodologies could be employed so as to completely avoid direct impacts on these locations. Sensitive receiving environments included (but were not exclusive to) wetlands, marine plants, riparian vegetation areas, unique vegetation assemblages, rare and threatened species in proximity to the works area, etc.

As the solar farm generation site is cleared, there remains no direct impact on vegetation, however there is the potential of indirect impacts on the integrity of adjacent vegetation habitats along Buchanan Creek through;

- accidental release of fuels, oils, lubricants and other hazardous materials from machinery during construction at the solar farm generation site. .
- potential for construction and general vehicle movements/ machinery to act as dispersal vectors for invasive species.
- sediments may be mobilised into adjoining vegetation/wetlands in periods of unexpected rainfall.

The potential for impacts from the above on the integrity has been identified in the DMG project EMP (attached). In summary, the potential for off site indirect impacts on vegetation arising from works at the solar farm generation will be limited through:

- there is no native vegetation / habitat to be removed for this project – no matters of state environmental significance (MSES) are within the development area of the lease and will not be impacted by the project.
- A buffer of 20m of existing cleared pasture has been surveyed between the solar farm infrastructure and will be demarcated and exempt from development.
- Cable network within the solar farm site is entirely underground.
- Major earthworks, e.g. access road/track, will take place during the drier periods of the year, nominally from June/July to December, and not take place during periods of rainfall or when heavy rainfall is forecast within 24hrs. .
- HDD lubricant will be bentonite clay, an inert substance which poses no risk to environmental values if accidentally spilled.
- A drainage plan has been identified (see Appendix E, drawing DRE-ELE-GAR-1002) that directs flow away from Buchanan Creek.
- The DMG project EMP will be updated to include the Erosion and Sediment Control Plan (ESCP) which will be prepared by the construction contractor and approved by the relevant Regulators (e.g. DSC, WTMA) prior to construction.
- The EMP include measures specific to Biosecurity Management, particularly that of known invasive species e.g. Yellow crazy ants, fire ants, Mikania, Siam weed, etc.

Overall, potential impacts of construction/operation of the solar farm generation site on vegetation values is considered to be very low risk.

3.1.2 Facilitative Development

A key issue that has been raised in the community interest, is the potential for the DMG project to promote further development in the project area, and hence encourage further development that may include vegetation clearing. A discussion of these cumulative / facilitative impacts is provided in the Section 5.3 of this report.

These aspects have been considered at a Commonwealth and State level during the approval process under the EPBC Act and the Wet Tropics Plan. The conclusions reached were that the existing drivers for development within the DMG project area will continue irrespective of the availability of grid electricity. Economic, social, and practical considerations (e.g. availability of reliable water supplies, improved solar technologies etc) will not be impacted by the provision of a grid supplied grid system.

The land available for further development is extremely limited, and the vast majority of development opportunities are in lower biodiversity importance areas (e.g. downtown Cow Bay) and not in high biodiversity areas where land uptake for conservation purposes exceeds available land for development.

Planning targets for the introduction of grid supplied electricity identified in various reports and studies have all been met within the DMG project area, these key thresholds include:

- Planning controls on development are enacted by Douglas Shire Council under the town planning scheme.
- Power supply and reticulation is of minimal environmental impact (e.g. underground), without the requirement for infrastructure linear severance impacts (i.e., clearing for overhead powerlines).
- Acquisition of high biodiversity important properties within key 'hot spot' precincts (e.g. Cooper Creek enclave of Turpentine and Stonewood Roads) into tenure secured conservation reserves or agreements exceed the number of available remaining developable properties.

3.1.3 Fauna and Habitat Considerations

Surveys for the DMG project have identified that construction personnel have a probability of interaction with wildlife in almost any location, however this is primarily expected to be within the road reserve network (not part of this DA), as the solar farm generation site is cleared, with no supporting habitat for native fauna.

The most notable encounters are likely to be reptiles (snakes of all kinds) with all works for the DMG project to be in daylight hours, and specific requirements regarding wildlife management have been identified in the project EMP, Appendix G to the Planning Report.

Primarily, risks to wildlife within the solar farm site is considered to be very low to negligible with the following identified as the key management measures with respect to minimising risk to wildlife and their habitats.

- Surveys of the adjoining vegetation to the solar farm generation site did not identify any colonial species (e.g. flying foxes) roosting or otherwise utilising the habitats adjacent the works area.
- No native vegetation habitat will be removed/disturbed for the entirety of the DMG project construction or operation. This is a fundamental premise for the project.
- It should be noted that the transformer kiosks and other enclosures have internal solid state equipment, do not require oil for cooling, and are virtually noiseless, they are also sealed from wildlife entry and cannot be accessed by snakes, frogs, rodents, insects etc.
- All construction activity will be between 7am and 5 pm, with no night time works to be undertaken.
- No trenches (or pits of any kind) will remain open overnight.
- All works will be subject to the provisions of an erosion and sediment control plan (ESCP) which is to be developed by the contractor and reviewed and approved by the Principal and incorporated into the EMP. This will form part of the contract between the Principal and the contractor.
- Invasive species, such as yellow crazy ants, are a serious biosecurity risk to wildlife and habitats throughout the DMG project area. Specific biosecurity requirements are identified in the EMP, and this includes the construction and operation of a washdown facility at the Silkwood Road solar farm and laydown area, and implementation of inspections and biosecurity clearances (including washdowns) for specific earth moving machinery prior to crossing the Daintree River to site.
- All construction staff will be inducted with respect to the EMP requirements, including how to respond to unexpected fauna interactions, notably snakes and cassowaries.

A traffic management plan will be developed in conjunction with the DSC for the project. Details of the traffic management aspect are set out in the attached DMG project EMP.

Facilitative impacts of the DMG project as a whole arising from the encouragement of further development, habitat clearing, and associated risks from domestic animals (cats and dogs) is beyond the scope of this project application to assess. The facilitative development risk arising from the DMG project implementation has been identified as negligible - refer Section 1 of this supporting information report, owing to other driving factors that are not influenced by the provision of a grid supplied electricity network (e.g., water supply reliability, very limited availability of land capable of being developed).

Notwithstanding, the construction and operation of the solar farm has additional considerations with respect to wildlife, and are also addressed in the attached project EMP. Aspects considered in the EMP include infrastructure design, vehicle movements and operational security of the solar farm.

The habitats represented at the solar farm do not provide any substantive habitat values for large fauna (or most fauna generally). The habitat is entirely introduced pasture grass, and there are no large populations of wallabies in the area known to utilise this paddock.

The solar farm area has an existing fence to contain cattle, and whilst this is not a significant barrier to cassowaries or wallabies, anecdotal information from landholders indicated that cassowaries prefer to move along the vegetated areas of the road reserve of Silkwood Road, or along the riparian vegetation of Buchanan Creek. The cassowary and wildlife corridor of Buchanan Creek is outside the lease area (to the west of the site) and will not be obstructed by fencing, or any other infrastructure or operations associated with the solar farm. Wildlife movements will continue as normal and as the operations are virtually silent at the solar farm, noise intrusion on this corridor is not expected to deter wildlife movement.

3.1.4 Vegetation Management

There is currently no regrowth vegetation within the entirety of the development footprint. Vegetation on site is dominated by introduced improved grass pasture species which are intended to be retained. This includes the 20m buffer of pasture grass that will be maintained between the infrastructure and the regulated vegetation tree line (as surveyed). The buffer grassed area and all grass pasture areas generally within the solar farm, both inside and outside the security fence, will be maintained by regular slashing. The regular slashing of the pasture is also an important element in fire management for the solar farm, and is also allowed for in the general design and layout of the solar farm. This includes a separation distance between the PV arrays of approximately 2.2m, sufficient to accommodate a tractor and slasher, and between component structures. General 'housekeeping' trimming of vegetation around the structures will be undertaken manually e.g., whipper snipper or similar, to ensure any vegetation remains entirely pasture grass. Local contractors would be engaged for the slashing and grass maintenance generally, within the solar farm.

3.1.5 Design Aspects:

The majority of the infrastructure components including the transformers, distribution, electrolysis machinery, generator containers etc are containerised (excepting the solar panels), and self-enclosed. Majority of the equipment is also solid state, and sealed. The purpose is for the containerised infrastructure to be fauna proof and prevent local fauna from accessing any operational components of the solar farm. This has been the design approach for most solar farms, as they are usually in remote areas where wildlife interactions are guaranteed.

Security fencing and lighting is a statutory requirement for generation sites under the provisions of the *Electrical Safety Act 2002* and associated regulations. As the solar farm will be a registered generation station under the *Electricity Act 1994*, VA is required to comply with all requirements related to site security and safety. The security fence will be designed in accordance with the requirements of ENA

Doc-015 National Guideline for Prevention of Unauthorised Access to Electricity Infrastructure. This guideline is not exclusive, and the security fencing will be between 1.8 and 2.0m high, and will not incorporate barbed wire, razor wire, knot wire meshes, or similar that may entrap bats, birds, reptiles or any other vulnerable fauna. Initial design has been for simple chain link mesh with single plain wire. The fencing will exclude (and protect) wallabies and cassowaries from potentially hazardous interactions with high voltage components within the solar farm. Lighting will be minimal, and restricted only to the immediate location of the generation equipment and is a security requirement. Lighting will movement activated, be directional, and of fauna sensitive design as set out in the National Light Pollution Guidelines for Wildlife (DEE 2020)³.

Extensive consideration has been given to the solar array panels, which will occupy the majority of the lease. Geotechnical investigations have identified that the soils and substrate are stable, and that no major earthworks are required for their installation. Each panel array will be on single steel pole concreted into the ground with a minimal exposed connection to the panel itself. Notwithstanding, it is anticipated that snakes, primarily pythons and various colubrid (such as tree snakes) may take up shelter beneath panels on occasion. This poses no risk to either the fauna or electrical operational safety as all cables are shielded and within conduits. All solar panel cabling be connected from panel to panel conduits throughout the solar farm, and connections between the solar panels and the generation equipment will be underground, so fauna access to cables (e.g. by white tailed rats) for rats etc, will be extremely limited. It is also anticipated as there are no prey resources (no habitat) present within the solar farm, that snakes (and similar) are extremely unlikely to venture into the solar farm arrays in the first instance.

Shading of the solar farm on adjacent habitats will not occur, the tallest panel is 2.6m and all infrastructure is set back a minimum 20m from the edge of the vegetation. All containerised electrical generation equipment is single storey and will not cast shadows over vegetation along Buchanan Creek.

Glint and glare from the solar panels is deemed not to impose a significant impact on fauna as:

- The panels are individually set according to the topography of the site. The site has a rolling topography, such that the angle of each panel will be slightly different to that of its neighbour. Sunlight will therefore only glint from individual panels at a time, or a few together at best (provided on the same slope and orientation). Unlike panels on flat topography there will be no situation where large quantities of panels in the one location (e.g. 10s or 100s) will provide a single, large scale glare phenomenon.
- The lowset nature of the panel (highest being 2.6m above the ground), renders any throwback glint/glare to a very restricted arc of viewing, which basically would be restricted to someone walking down that line of the panels.
- Birds flying overhead would be subject to glint and glare from isolated individual panels or small groups at worst, in a manner not dissimilar to existing galvanised tin roofing, or household roof mounted solar panels. There are no large scale daylight migratory bird overflights in the Daintree that could be affected by this phenomena.

3.2 Soil and water considerations

3.2.1 Geotechnical Investigations

Geotechnical surveys were completed in February 2023 with a report specific to the solar farm generation site (refer Appendix H, Planning Report).

³ <https://www.agriculture.gov.au/sites/default/files/documents/national-light-pollution-guidelines-wildlife.pdf>

The geotechnical report essentially summarised site conditions across the solar farm generation site as:

- Natural soils comprise stiff to hard alluvial cohesive soils and appear to be moderately resistant to erosion when covered, and when exposed may experience some slaking, but are unlikely to be dispersive.
- Natural soils are suitable as non-structural fill for the construction of embankments associated with drainage works and similar non-structural features.
- Groundwater was not encountered and does not present a threat to bored piers/foundations and for the solar panel array supports generally.
- Actual or potential acid sulphate soil conditions were not observed in any location within the lease area, nor were identified through laboratory testing of selected test samples.

Across all sampled sites within the DMG project area, there is no indication of PASS/ASS at any location.

3.2.2 Waterways

The DMG project is largely unaffected by hydrological characteristics within the project area. The solar farm is located on cleared and mildly sloping well drained land with a maximum elevation of approximately 47m and is not subject to flooding nor overland flow events. Buchanan Creek forms the western boundary of the solar farm site, and is a small, deeply incised watercourse that does not overtop the banks of the creek under even extreme rainfall events, and is adjacent to, but is not within the DMG project lease. A buffer of 20m of cleared land between the riparian vegetation of Buchanan Creek and the generation site infrastructure has been surveyed and will not be developed.

Silkwood Road acts as the catchment for an overland flow path that traverses the solar farm generation site. This flow path diverts water away from Silkwood Road through the property in extreme rainfall events, but otherwise is a dry gully. It has been confirmed by the Department of Agriculture and Fisheries that this overland flow path does not constitute a waterway for the purposes of waterway barrier assessments.

Management of waterways water quality has been identified in the supporting EMP Appendix G to the Planning Report.

3.2.3 On-site effluent disposal

It is noted that the Daintree microgrid solar farm day-to-day operations are controlled by telemetry, responding to on-site supervisory control and data acquisition (SCADA) systems which are remotely monitored in real time. There are no workers operating or managing the solar farm on a daily basis. The solar farm will be subject to scheduled inspections of components in accordance with manufacturers specifications by contract workers experienced in the particular component. These personnel would access the solar farm on a 'as required' basis. Given the remote operation and monitoring of the solar farm, no daily operator required on site, and the irregular and short-term visitation nature of scheduled monitoring and maintenance, no permanent on-site ablution facilities are proposed for the solar farm.

In those situations during refurbishment, repair or maintenance requires personnel to be on site for more than the day, then commercially provided and maintained temporary portable ablution facilities may be placed on site. These would be placed onsite as and when needed depending on the amount of maintenance activities required. Such facilities are self-contained chemical units which have no off-site discharge, and would be removed like any other temporary works system if such a system was deemed necessary by a contractors own internal O&M requirements.

3.3 Fire, and Fire Hazard Management

Fire management for the solar farm is an integral part of the design and operation of the solar farm generation site. The fire system will be designed and certified by specialist fire engineers, installed, tested and commissioned to ensure it is an AS 2419 compliant system. Fire management is geared towards the following risk aspects:

3.3.1 Non-chemical/electrical External fire risks

Primarily this relates to the vulnerability of the solar farm to external risks, notably the potential for bush or grass fires to impact on the site. Chemical and electrical fires are considered further in this response. It is noted that the solar farm generation is not within a bushfire hazard overlay as identified in Schedule 2 of the DSC Planning Scheme.

Notwithstanding, a number of key aspects have been included in consideration of the non-chemical/electrical risk. Fire management measures for non-chemical/electrical risks include:

- Appropriate clearances between equipment as per relevant standards and industry best practice – including (but limited to) conditions of the Electricity Safety Act 2002 and Code of Practice 2019 Construction and operation of solar farms, National Fire Protection Association Standard 855-2023, and the Australia New Zealand Industrial Gas Association Standard.
- Cabled system, with no external (outdoor) live switchgear or exposed busbars which could potentially be a source of ignition/sparks, The overall facility includes separated and specific isolated lightning protection system to the central generation facility (CGF) area, battery energy storage systems (BESS), H2 processing/storage area, and PV arrays, as required by difference in protection methodology for each component required by relevant standards. Thus the risk of lightning being an ignition sources is significantly reduced by the application of different lightning protection systems for each component type.
- Maintenance of the pasture grass area with a minimum buffer width of 20m between all infrastructure and the edge of the existing regulated vegetation.
- The use of road and track curtilage that surrounds the generation infrastructure, and provides a further hardened (gravel) surface that both provides an additional firebreak, and also allows emergency vehicle access to all generation components. The road and track curtilage also provides necessary clearance (along with the 20m of maintained cleared pasture as buffer) in accordance with the separation requirements for solar farm infrastructure (such as the BESS and LPG storage) from property boundaries.
- General maintenance of the pasture grass through slashing to reduce grass fuel loads. Allowance has been made in the placing of the PV arrays such that a tractor and slasher can mow between the panels (approximately 2.2m apart).
- The width of the front gates of the security fence (minimum 4000mm as per building codes), and access from Silkwood Road, allow access to the site for all emergency service vehicles, e.g. fire trucks, ambulance, etc.
- Remote surveillance cameras and telemetry provide real-time monitoring of site conditions at the solar farm generation site 24/7.
- There is a N+1 High pressure firefighting skid with a fire system pump set, located by the 110kL tank, which is shown in drawing DRE-ELE-GAR-1001-01, pump sets will be compliant to AS 2419 (dual electric pump set as listed in section 6.4.1 and recommended in order to eliminate reliance on diesel fuel)
- Firefighting facilities for LPG Storage requirements as (Table 13.1 AS/NZS 15986-2014) are to be observed as shown below.

Table 13.1 — Fire protection facilities for cylinder storage

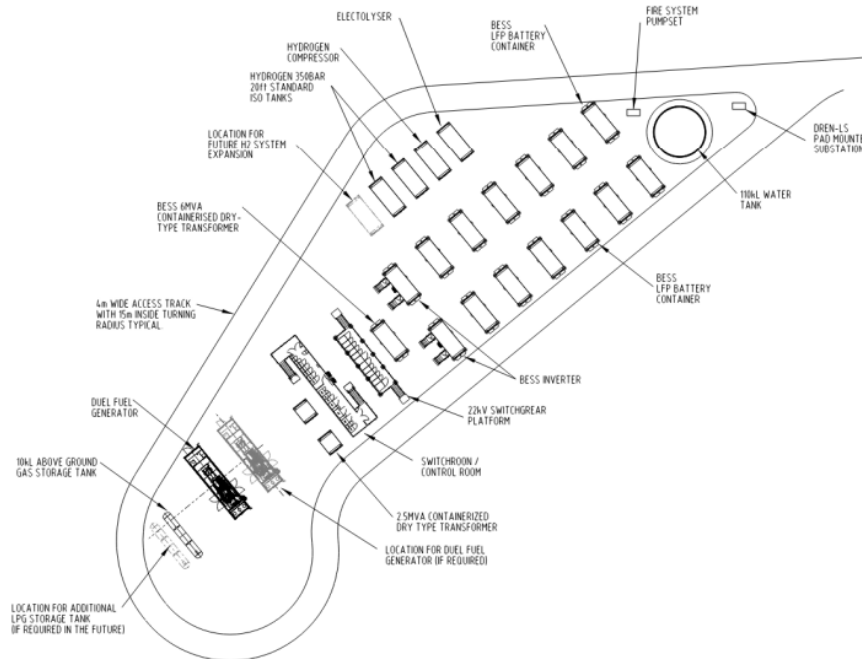
Aggregate capacity L	Requirements
≤1 000	—
Greater than minor storage, outdoors	No specific requirements
Greater than minor storage, indoors	At least one hose reel or one extinguisher*
>1 000 ≤12 000	At least one hose reel or one extinguisher
>12 000 ≤60 000	At least one hose reel and one extinguisher, or two hose reels
>60 000	At least two extinguishers and two hose reels with one on-site hydrant system, or monitors, or a sprinkler system

* This requirement does not apply to domestic portable cylinders used in a residential situation.

NOTE In New Zealand, one fire extinguisher is required where there is more than 50 kg of LP Gas stored or used and two fire extinguishers if the quantity exceeds 200 kg. The fire extinguishers may be substituted by a hydrant system incorporating a 20 mm diameter hose fitted with a spray nozzle.

- Risk assessment shall be conducted to assess the requirements of the fire hose connection based on the distance to public and protected places (as per section 13.2 and figure 13.1 of AS/NZS1596- 2014)

Figure 8 CGF General Layout (excl Solar Farm)



Layout of the Central Generation Facility Islanded by Accessway

All plant as shown above have clearances at or exceeding requirements of the relevant standards noted.

3.3.2 Battery Energy Storage Cells (Lithium Iron Phosphate (LiFePO4) cells)

Designers and installers in Queensland have a duty under the Electrical Safety Act 2002 to ensure their battery storage installs are, as far as is reasonably practicable, electrically safe, this also includes consideration of the thermal risk posed by the batteries. To meet this duty of care, recommendations, standards and conditions under section 4.4.3.3 and sub-section 4.4.3.3.4 of the National Fire Protection Association (NFPA) Standard 855-2023 (Standard for the Installation of Stationary Energy

Storage Systems) are being implemented for the DMG Project. For clearances around BESS containers, a minimum of 3.5m (10ft recommended by NFPA 855) is identified in the NFPA standard 855. The Daintree Microgrid facility is using an increased clearance of 4m between container to allow for light vehicle movement, unloading of light goods from LV with enclosure door open. This increased clearance is also in line with recommendations by Queensland Fire and Emergency Services to allow emergency services vehicle access in event of a fire and/or allow individual batteries to 'burn out' without risk to adjoining batteries or the environment.

LiFePO₄ compared to other lithium-ion chemistries have significantly higher thermal stability due to its stable crystal structure, higher thermal onset runaway temperature and significantly significant reduction in oxygen release during a thermal event as such unlike NMC (Nickel Manganese Cobalt) which can lead to rapid oxygen release needs flooding of cells. Unlike NMC this requirement isn't needed for LiFePO₄ therefore gaseous fire suppression is used within each BESS container and is part of the manufacturers OEM (original equipment manufacturer) platform.

There are multiple redundancy layers of controllers which monitor thermal conditions, cell voltage and state of charge and rate of charge/discharge. Collectively referred as the BMS, or Battery Management System, this type of technology oversees the performance of the battery arrays. This layered redundancy system in the BMS is continuously optimizing for safety and is regularly checked by the OEM for warranty and safety compliance. SCADA systems within the units will detect any anomalous behavior and will shut down the effected system, and real-time alerts (text, emergency messages, other digital) will also be issued to fault crews to attend site ASAP and remediate, where the level of alert cannot be controlled externally.

3.3.3 Hydrogen and LPG storage components

Storage of LPG and produced H₂ at the hydrogen facility has defaulted to either an Australian Standard or International/Industry Group (Australia New Zealand Industrial Gas Association ANZIGA, Gaseous Hydrogen Installations) when a specific standard doesn't exist.

Ensuring clearances between equipment is critical for site compliance to relevant standards, the Daintree Microgrid solar generation farm designed has increased these clearances to provide an additional safety margin and improve maintenance operations as set out in the following.

Clearances between LPG tanks.

Clearances as shown in section 6.2.2 and table 6.1 of AS/NZS1596-2014 have been applied in the generation facility layout. Spacing between tanks will not be less than diameter of the tank. Tanks with diameter of 1.2m were selected, therefore the clearance between tanks shall not be less than 1.2m. For location of tanks at CGF, 1.2m was used.

Figure 9 Clearances for LPG Tanks (Table 6.1 of AS/NZS1596-2014)

Table 6.1 — Location of above-ground storage tanks

1	2	3	4
Capacity of the tank kL	Minimum distance to an adjacent LP Gas tank m	Minimum distance from the tank to a public place, or a railway line m	Minimum distance from the tank to a protected place m
≥0.5	Diameter of the largest tank	1.5	1.5
1		2	3
2		4 (3)	6 (4.5)
5		5 (3.5)	8 (5)
8		6 (4)	10 (6)
10		7	11
15		8	14
20		9	15
50		10	17
100		11	20
200		12	25
500		22	45

Clearances from LPG tanks to other objects.

Clearances as per Table 6.1 of AS/NZS1596-2014 were used during concept design. Due to the location of tanks, and 20m clearance between vegetation and the infrastructure, all clearances specified in AS/NZS1596 are met. For clearance, the distance between a tank and ICEG (generator), 7m clearance was used to meet requirements for 10kL tank clearance from public place. However ICEG is not considered as a public place, clearance to public place was used for clarity.

Clearances from H₂ infrastructure to other objects.

Australia Hydrogen standards and regulations are still in their infancy, therefore horizontal safety clearances proposed by ANZIGA in the document Gaseous Hydrogen Installations have been used. In the design. Clearance of 5m between BESS containers was specified (to comply with clearance from electrical equipment). 8m clearance from LPG tanks was exceeded. 8m clearance to site boundary was exceeded due to 20m vegetation clearance. Clearance recommended by ANZIGA are greater compared to clearances listed in table 7.6.2 of NFPA 55. Hydrogen gas at room temperature is very buoyant and when not confined rises at several meters per second, this rapid diffusion in air significantly helps keep the air fuel ratio extremely lean for all but the biggest leaks and as such the gas doesn't follow the terrain to pool and potentially find ignition sources unlike other gases.

Table 1 – Typical minimum horizontal safety distances for hydrogen stations

Typical type of outdoor exposure	Distance in metres of hydrogen from
1. Open flames and other ignition sources (incl. electrical)	5
2. Site boundary and areas where people are likely to congregate such as car parks, canteens, etc.	8
3. Wooden buildings or structures	8
4. Wall opening in offices, workshops, etc.	5
5. Bulk flammable liquids and LPG storage above ground in accordance with national codes, where they exist, for the particular substance. Otherwise	8
6. Bulk flammable liquid and LPG below ground	
6.1 Tank (horizontal distance from shell)	3
6.2 Vent or connections	5
7. Flammable gas cylinder storage, other than hydrogen	5
8. Gaseous oxygen storage (cylinders)	5
9. Liquid oxygen storage (not greater than 125 000 litre tank capacity) ²⁾	8 ¹⁾
10. Non-flammable cryogenic liquid storage, other than oxygen, <u>for example</u> argon, nitrogen ¹⁾	5 ¹⁾
11. Stocks of combustible material, <u>for example</u> timber	8
12. Air compressor, ventilator intakes, etc.	15

¹⁾ Where satisfactory arrangements are made to divert liquid spillage away from the hydrogen system, these distances may be reduced.

²⁾ For tank capacities greater than 125 000 litres see EIGA Document 127, Bulk Liquid Oxygen, Nitrogen and Argon Storage Systems at Production Sites [21].

(Clearances for Hydrogen Installation (Table 1 of ANZIGA Document Gaseous Hydrogen))

Similar to the BESS, monitoring and control for both the H₂ and LPG storages will be automatic, and include additional gas sensors in dedicated equipment such as the electrolyser and dual fuel engine. Any leaks or thermal anomalies noted by the monitoring equipment and SCADA will operate in a similar way to the BESS where the affected system is shut down and a emergency notifications (text, online, phone etc) to the fault crews is issued to be remedied ASAP. On site portable fire fighting equipment appropriate to the fuel source risk and type will also be maintained on site.

3.4 Construction Traffic

Community engagement over the design phase of the DMG project has identified traffic as a construction during construction.

A formal Traffic Management Plan (TMP) will be prepared conjointly between VA and independent contractors responsible for works within the road reserve. The TMP will be also be prepared in consultation with Douglas Shire Council, and will be subject to Council approval. A traffic movement summary is presented in the following.

Heaviest traffic loads are expected for the movement of construction materials from south of the Daintree River to the lay down areas at the solar farm site. This will require the greatest number of vehicle movements, transporting the numerous solar panels over the Alexandra Range. These will be small trucks carrying the panels, with up to 4 return trips per day from Cairns carrying the panels. Anticipated that there could be over three weeks, non-continuous, of this activity. All movements are during daylight, and will only be to Silkwood Road and the solar farm, which will be the designated site laydown area. The other items (generator shed, battery shed, transformers etc) are modular in containers, and will average about two larger trucks (not semis) trips per day over a period estimated at two weeks (non-continuous). All vehicles will comply with load and dimensions restrictions as applicable to the Daintree River ferry and Alexandra Range.

All personnel will be checked in and parked at the solar farm site off Silkwood Road each working day. This will include the workers bus from south of the river (or local) where required. Only vehicles essential to construction will leave the laydown area each day, with the personnel required. The only

individual project vehicles parked on the road during construction will be those relevant to traffic management, project/contract management, or monitoring and auditing personnel. There will be no individual personnel vehicle parking their vehicles at work sites along the road network.

Overall, because of the specialised nature of the construction, there are not high levels of miscellaneous vehicles accessing the various road reserves. Busy periods, such as weekends, will largely be avoided for works along the main Cape Tribulation Road, and the rationalisation of construction worker personnel travel to/from site using a communal vehicle (construction bus), will similarly negate many of the vehicle congestion issues. All works, including transport, are during normal daylight working hours, and with strict traffic management at the construction sites, there is no anticipation of any high-risk fauna/private traffic/machinery/transport interactions in excess of what currently occurs on the Cape Tribulation Road.

3.5 Daintree Microgrid Decommissioning

Refurbishment and replacement of components will be a natural consequent of maintenance, repairs, and improvements owing to upgraded technology, that will happen over the initial 30 years of the project, and potentially over the option expansion of another 30 years – 60 years in total. The technology and regulatory requirements, including that for disposal and recycling, for the future time frames noted is unknown. Subsequently, we are suggesting that Council request a Decommissioning Plan as a condition of the Development Permit at such time as the solar farm may reach its end of operational or lease agreement life.

3.6 Eastern Kuku Yalanji Tradition

Daintree National Park is subject to an Indigenous Landuse Agreement (ILUA QI2006/026) under the provisions of the *Native Title Act 1993* and managed under the Daintree National Park Plan of Management 2018. The DMG project area is within the traditional lands of the Eastern Kuku Yalanji, and in Sept 2021 the Qld Govt delivered Deeds of Grant of the Daintree NP to Jabalbina Yalanji Aboriginal Corporation on behalf of the Eastern Kuku Yalanji People, with these lands now managed under an Indigenous Management Agreement.

The Eastern Kuku Yalanji Aboriginal people are the Traditional Owners of this area. Their country extends from near Cooktown south to Mossman.. For the Eastern Kuku Yalanji people many natural features of the landscape have spiritual significance including Wundu (Thornton Peak), Manjal Dimbi (Mount Demi), Wurrmbu (The Bluff) and Kulki (Cape Tribulation). Story places (mountains, rivers, waterfalls, swimming holes, trees) within this landscape are important to the Eastern Kuku Yalanji.

Jabalbina Aboriginal Corporation, representing the Traditional Owners (Eastern Kuku Yalanji) of the project area are key supporters in the Daintree Microgrid Project (<https://voltadvisorygroup.com/#who-we-work>). A project support letter is included as an attachment to the DA Planning Report .

Jabalbina have engaged archaeologist John Dockrill to undertake a Cultural Heritage Clearance and Assessment Report independent of this DA, to support the preparation of a Cultural Heritage Management Plan (CHMP). The Traditional Owners who speak for Country relevant to the Project Area were engaged during the Cultural Heritage Clearance and Assessment Report.

The CHMP to be prepared will have regulatory authority under the provisions of the Qld *Aboriginal Cultural Heritage Act 2003*. VA and all contractors will be required to follow this CHMP as part of their EMP obligations.

The Cultural Heritage Clearance and Assessment Report has identified that there are no cultural heritage aspects, designated landscape areas or registered cultural heritage study areas/sites in the immediate construction locality of DMG project solar farm generation site. VA will engage Cultural Heritage Observers during all earth disturbance phases of the construction process for the project, in

accordance with the risk identification procedures nominated in the Cultural Heritage Clearance and Assessment Report.

4. Conclusions

The DMG project, when undertaken in the manner described in this technical document and Planning Report, and in conditions attached to regulatory approvals, will have no quantifiable impact on the natural, social or physical attributes that collectively make up the Daintree 'experience' to either visitors or residents.

The DMG project does not require habitat clearing or interference, is not visually intrusive, and provides social equity in terms of access to a secure grid supplied electricity network available to most other Australian communities.

The DMG project is not a demonstration of untested, untried technologies, but rather of technology that has now entered the mainstream of alternative energy generation and distribution, with the technology having been underwritten and supported by the CSIRO during the design phase of the DMG project.

Depending on customer uptake, the DMG project provides an alternative to traditional energy fuel sources and may remove between 8,000 to 10,000 metric tonnes of carbon emissions per year.

Appendix E – Plans of Development



SITE LOCATION:
LOT 5 BK157130
BUCHANAN CREEK ROAD
COW BAY QLD 4873



APPLICANT: VOLT ADVISORY GROUP PTY LTD.
PROJECT: DAINTREE RENEWABLE MICRO GRID

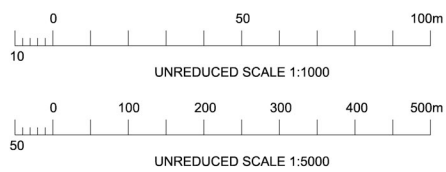
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CONTOUR INTERVAL: 1m
PARISH OF: COW BAY
LOCAL GOVERNMENT: DOUGLAS SHIRE

SCALE: 1:500 & 1:1000
REF. No. AU213008233
PLAN No. SP340614
DATE SURVEYED: 22/02/2023

SURVEYOR: RPS AAP CONSULTANTS PTY LTD
DRAWN: RPS AAP CONSULTANTS PTY LTD
DATE DRAFTED: 22/03/2023
CHECKED: J.SOLOMON

DESIGNED: ZW SOLUTIONS PTY LTD
DRAWN: PMC
DATE DESIGNED: 10/05/2023

NOTES:
DETAILS REFER TO DRAWING DRE-CIV-GAR-1021



INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

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B1	2/8/23	ISSUED FOR CONCEPT APPROVAL	PMC			DRE-ELE-GAR-1003	FENCE PLAN
A	10/05/23	ISSUED FOR COUNCIL APPROVAL	PMC	PZ	SC	DRE-ELE-GAR1001	SITE PLAN



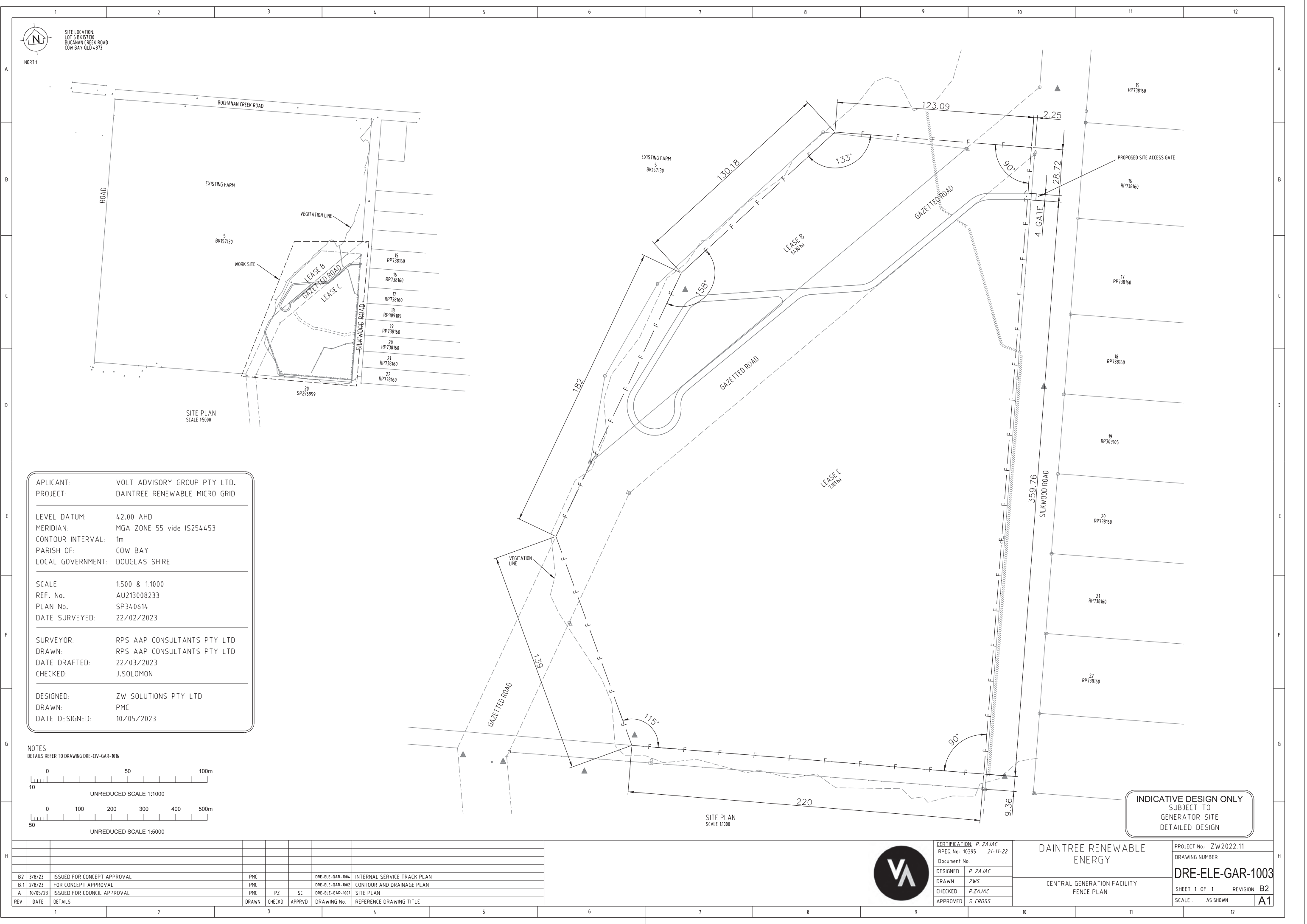
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RPEQ No.	10395
Document No.	21-11-22
DESIGNED:	P. ZAJAC
DRAWN:	ZWS
CHECKED:	P. ZAJAC
APPROVED:	S. CROSS

DAINTREE RENEWABLE
ENERGY
CENTRAL GENERATION FACILITY
CONTOUR AND DRAINAGE PLAN

PROJECT No.:	ZW2022.11
DRAWING NUMBER	DRE-ELE-GAR-1002
SHEET 1 OF 1	REVISION B2
SCALE:	AS SHOWN



SITE LOCATION:
LOT 5 BK157130
BUCHANAN CREEK ROAD
COW BAY QLD 4873



SITE PLAN
SCALE 1:5000

SITE PLAN
SCALE 1:1000

APPLICANT: VOLT ADVISORY GROUP PTY LTD.
PROJECT: DAINTREE RENEWABLE MICRO GRID

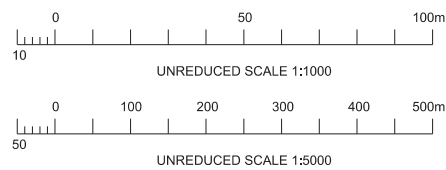
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CONTOUR INTERVAL: 1m
PARISH OF: COW BAY
LOCAL GOVERNMENT: DOUGLAS SHIRE

SCALE: 1:500 & 1:1000
REF. No. AU213008233
PLAN No. SP340614
DATE SURVEYED: 22/02/2023

SURVEYOR: RPS AAP CONSULTANTS PTY LTD
DRAWN: RPS AAP CONSULTANTS PTY LTD
DATE DRAFTED: 22/03/2023
CHECKED: J.SOLOMON

DESIGNED: ZW SOLUTIONS PTY LTD
DRAWN: PMC
DATE DESIGNED: 10/05/2023

NOTES:
DETAILS REFER TO DRAWING DRE-CIV-GAR-1016



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A	10/05/23	ISSUED FOR COUNCIL APPROVAL	PMC	PZ	SC	DRE-ELE-GAR-1001	SITE PLAN



CERTIFICATION	P. ZAJAC
RPEQ No.	10395
Document No.	21-11-22
DESIGNED	P. ZAJAC
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CHECKED	P. ZAJAC
APPROVED	S. CROSS

DAINTREE RENEWABLE
ENERGY
CENTRAL GENERATION FACILITY
FENCE PLAN

PROJECT No.	ZW2022.11
DRAWING NUMBER	DRE-ELE-GAR-1003
SHEET 1 OF 1	REVISION B2
SCALE	AS SHOWN



SITE LOCATION:
LOT 5 BK15130
BUCHANAN CREEK ROAD
COW BAY QLD 4873

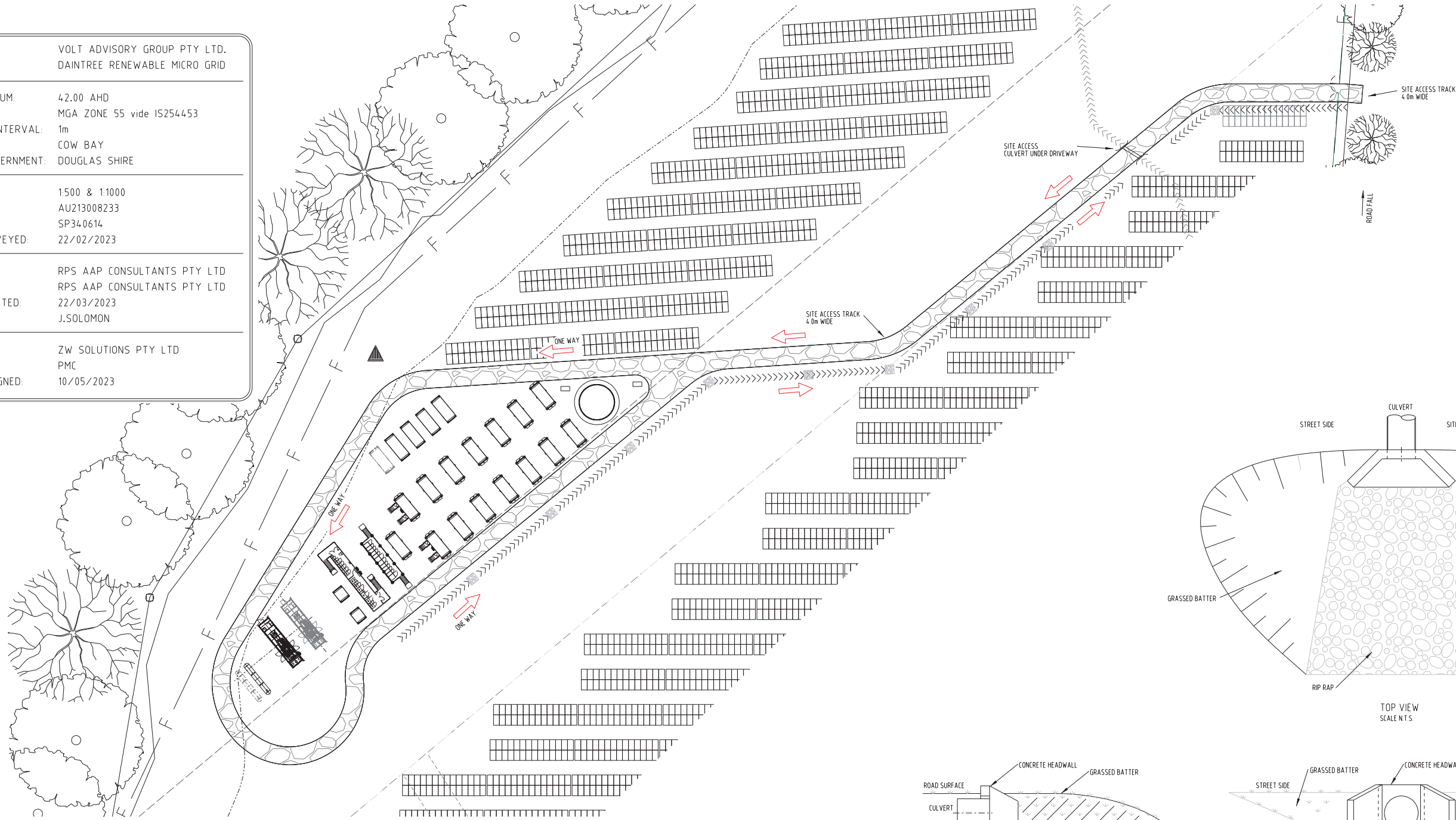
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PROJECT: DAINTREE RENEWABLE MICRO GRID

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CONTOUR INTERVAL: 1m
PARISH OF: COW BAY
LOCAL GOVERNMENT: DOUGLAS SHIRE

SCALE: 1:500 & 1:1000
REF. No. AU213008233
PLAN No. SP340614
DATE SURVEYED: 22/02/2023

SURVEYOR: RPS AAP CONSULTANTS PTY LTD
DRAWN: RPS AAP CONSULTANTS PTY LTD
DATE DRAFTED: 22/03/2023
CHECKED: J.SOLOMON

DESIGNED: ZW SOLUTIONS PTY LTD
DRAWN: PMC
DATE DESIGNED: 10/05/2023

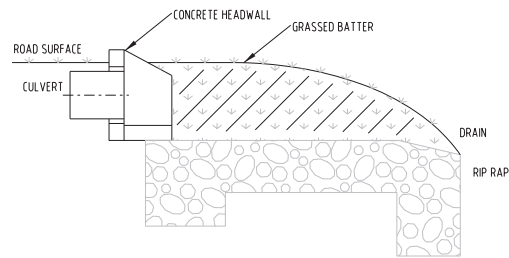


ROAD PLAN
SCALE 1:500

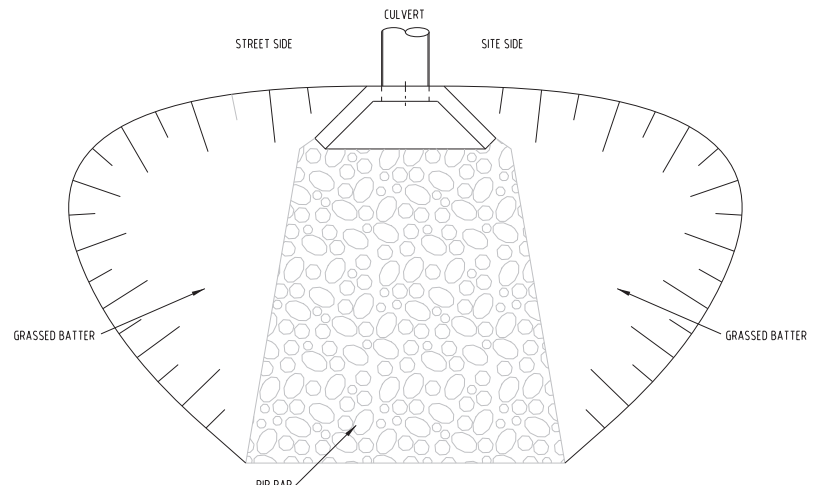
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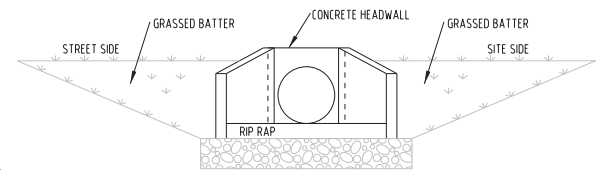
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ITEM	MINIMUM REQUIREMENT
LOAD TO BE SUPPORTED	100 TONNES
CONCRETE EDGING (BITUMEN ROAD)	N/A
MAXIMUM ACCESS ROAD GRADIENT	1:15 OR 4 DEG
MINIMUM ACCESS ROAD TURNING	15m INSIDE RADIUS



L/H SIDE VIEW
SCALE N.T.S.



TOP VIEW
SCALE N.T.S.



FRONT VIEW
SCALE N.T.S.

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

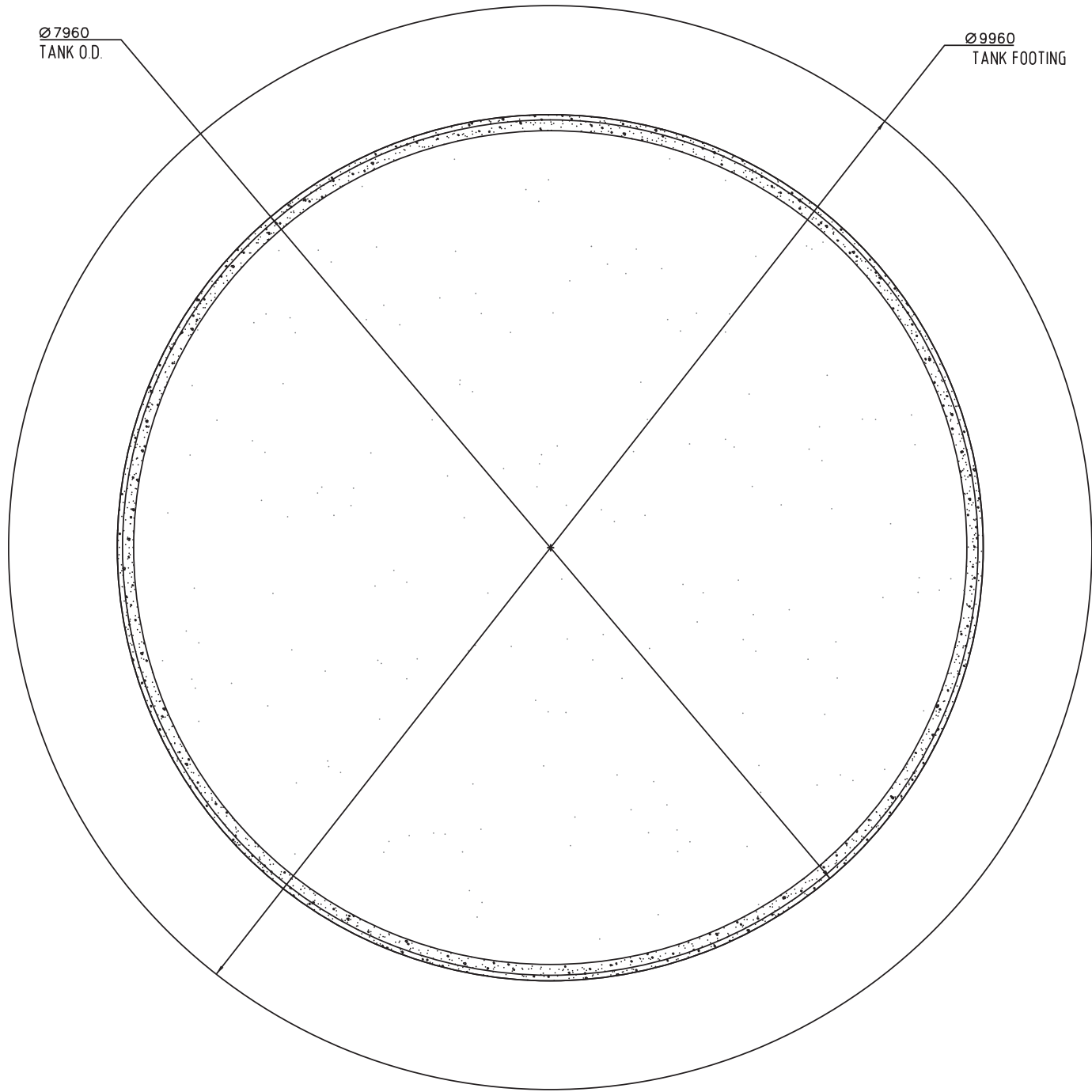
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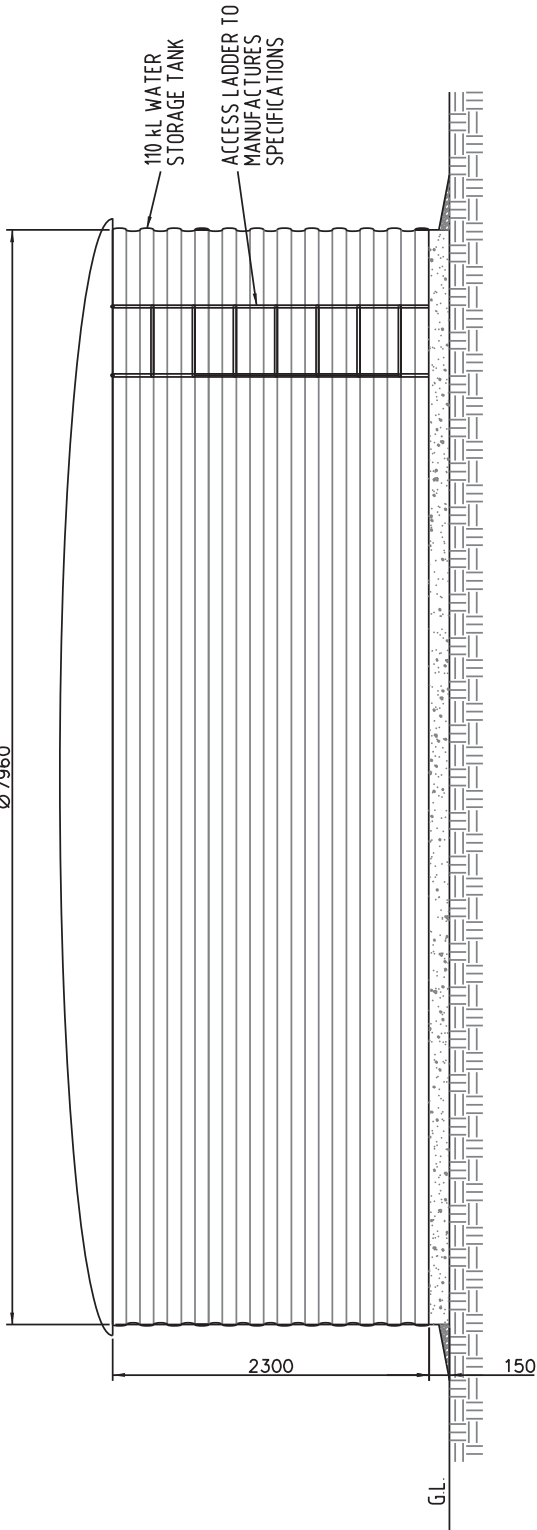
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Document No.	21-11-22
DESIGNED	P. ZAJAC
DRAWN	ZWS
CHECKED	P. ZAJAC
APPROVED	S. CROSS

DAINTREE RENEWABLE
ENERGY
CENTRAL GENERATION FACILITY
ROAD PLAN

PROJECT No.	ZW2022.11
DRAWING NUMBER	DRE-ELE-GAR-1004
SHEET 1 OF 1	REVISION B2
SCALE	AS SHOWN



TOP VIEW



FRONT VIEW
WATER STORAGE TANK
SCALE 1:25 (ROTATED)

WATER TANK DETAILS
TANK CAPACITY: 110 000 Ltrs

INDICATIVE DESIGN ONLY
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GENERATOR SITE
DETAILED DESIGN

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A	26/04/23	ISSUED FOR REVIEW	PMC	PZ	SC		



CERTIFICATION	P ZAJAC
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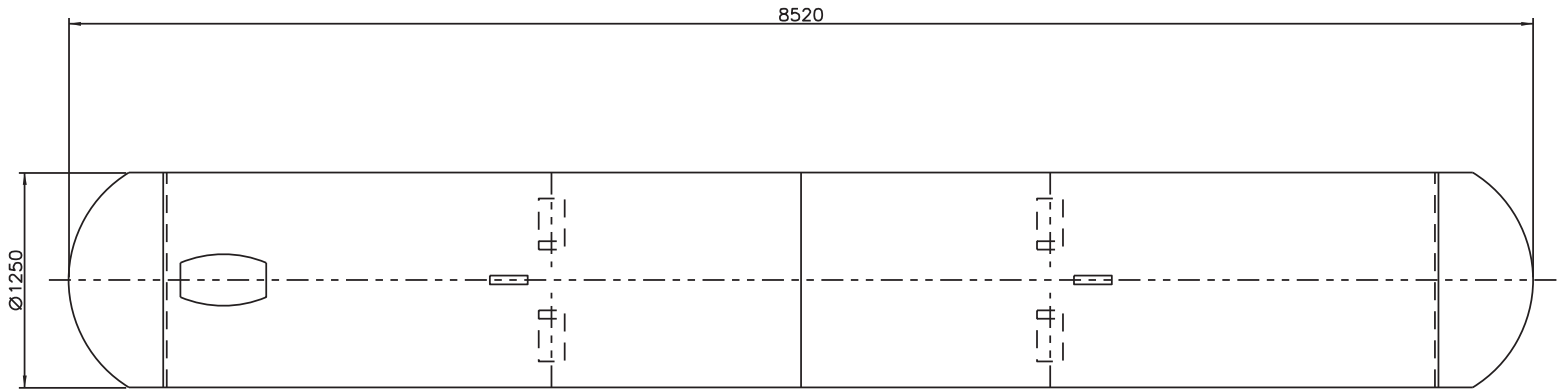
DAINTREE RENEWABLE
ENERGY

CENTRAL GENERATION FACILITY
WATER TANK
DETAILS

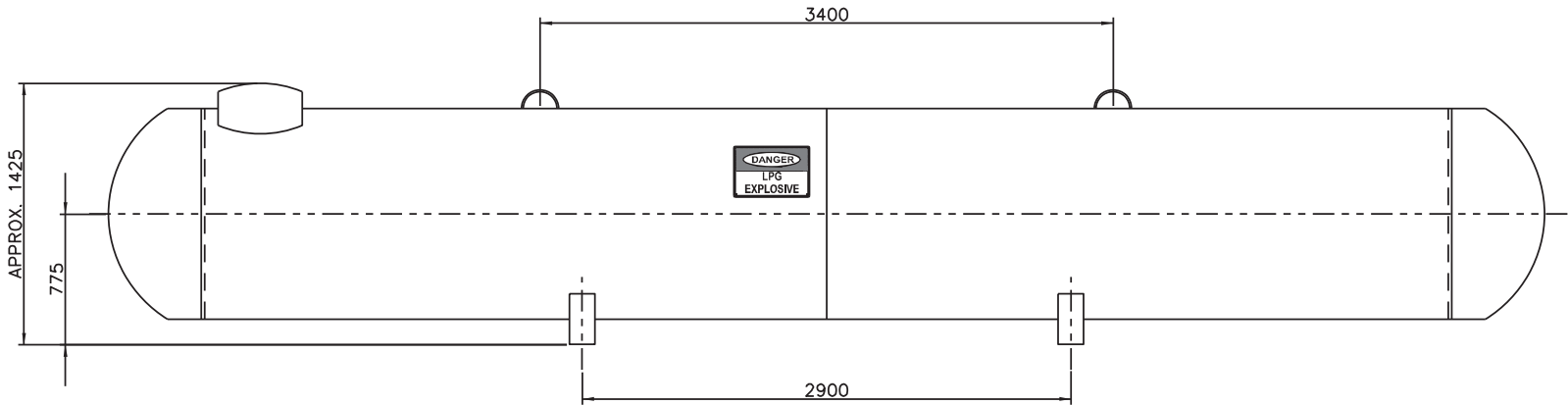
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SHEET 1 OF 1	REVISION B
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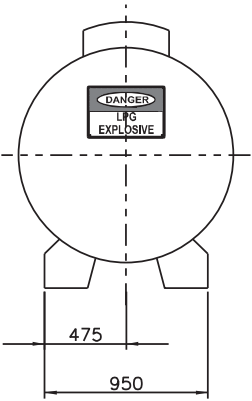
LPG STORAGE TANK DETAILS
TANK CAPACITY: 10000 Ltrs



TOP VIEW
SCALE 1:50



FRONT VIEW
SCALE 1:50



R/H END VIEW
SCALE 1:50

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

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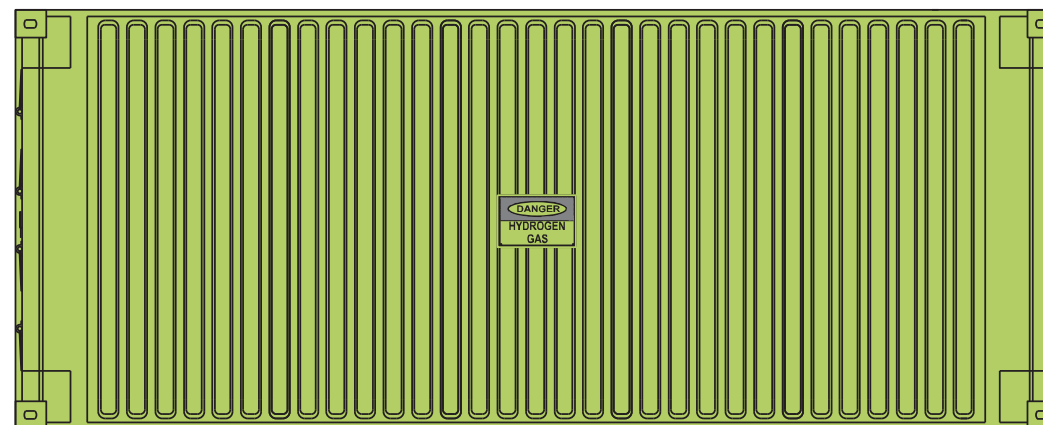
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DAINTREE RENEWABLE
ENERGY

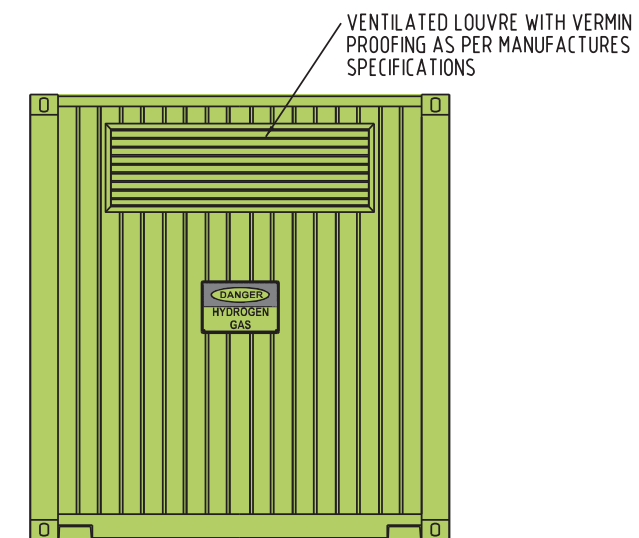
CENTRAL GENERATION FACILITY
GAS TANK
DETAILS

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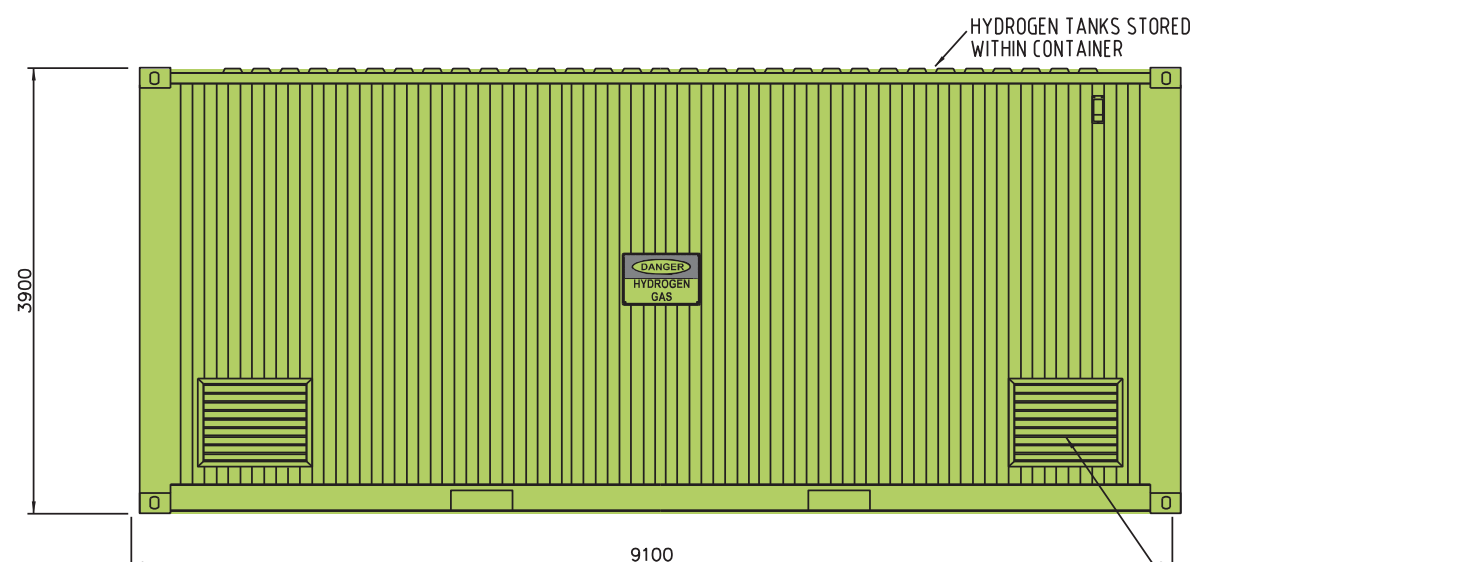
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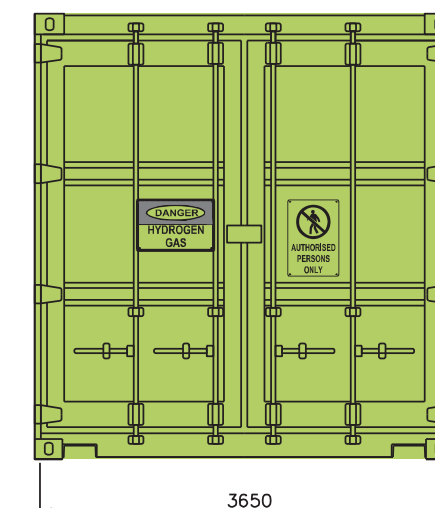
TOP VIEW



END VIEW



FRONT VIEW
HYDROGEN GAS TANK STORAGE UNIT
SCALE 1:20



END VIEW

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

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A	26/04/23	ISSUED FOR REVIEW		PMC	PZ	SC			
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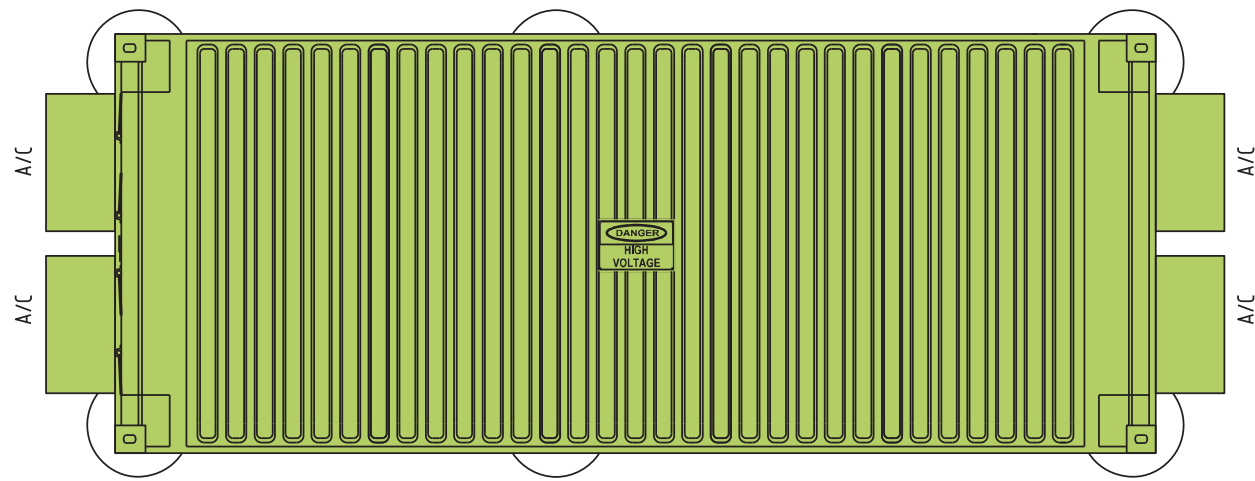


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CHECKED	<i>P. ZAJAC</i>
APPROVED	<i>S. CROSS</i>

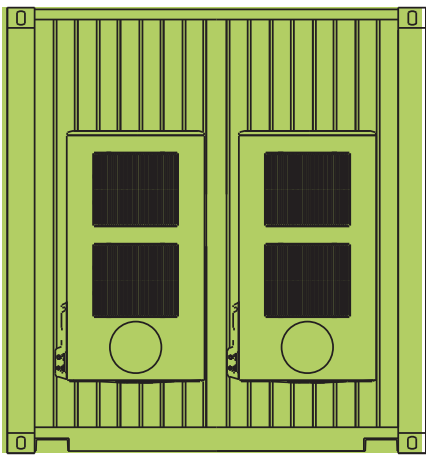
DAINTREE RENEWABLE
ENERGY

CENTRAL GENERATION FACILITY HYDROGEN GAS FUEL TANK DETAILS

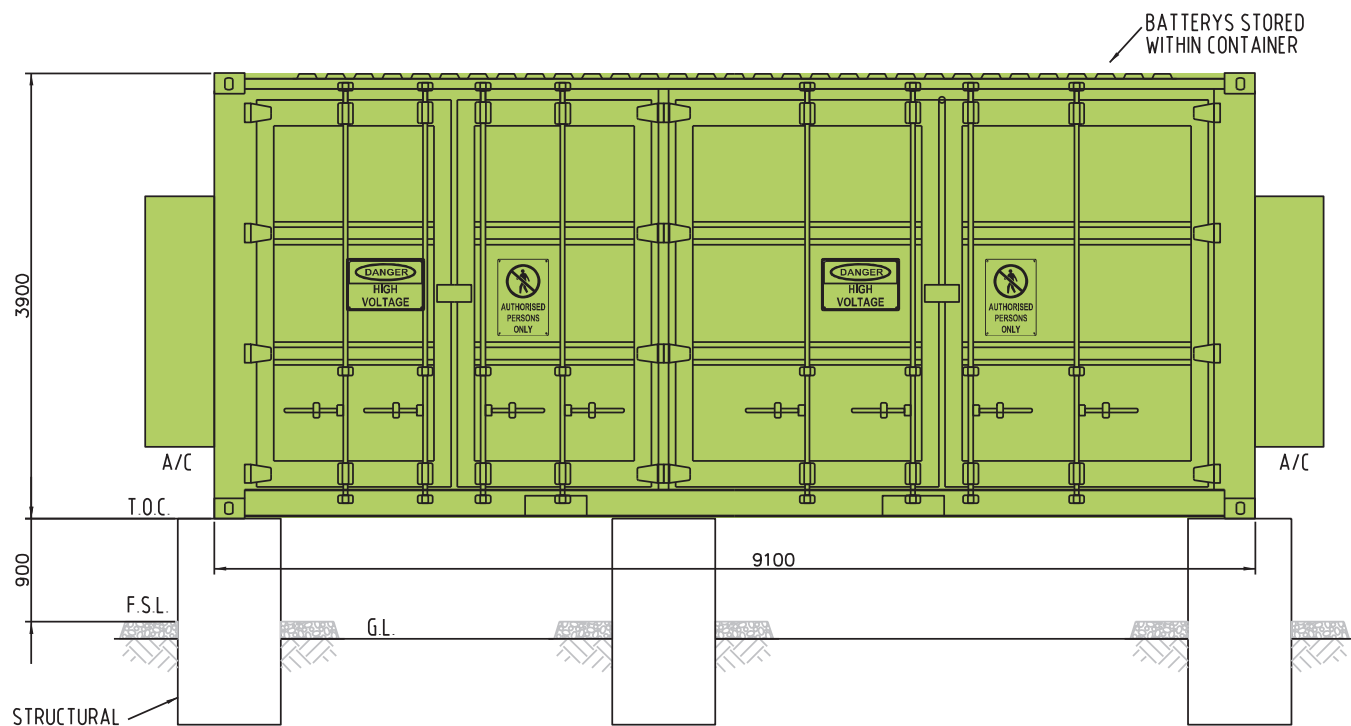
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SHEET 1 OF 1 REVISION B	
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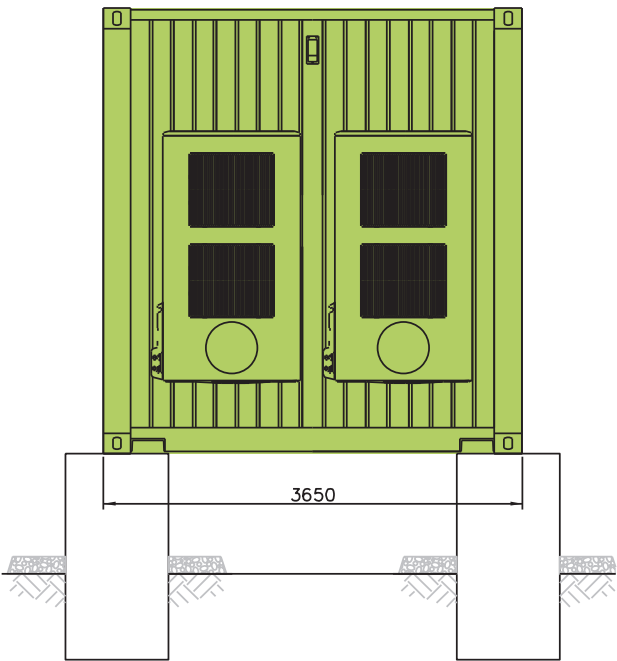
TOP VIEW



END VIEW



FRONT VIEW
BATTERY ENERGY STORAGE SYSTEM (BESS) UNIT
SCALE 1:20



END VIEW

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

REV	DATE	DETAILS	DRAWN	CHECKD	APPRVD	DRAWING No	REFERENCE DRAWING TITLE
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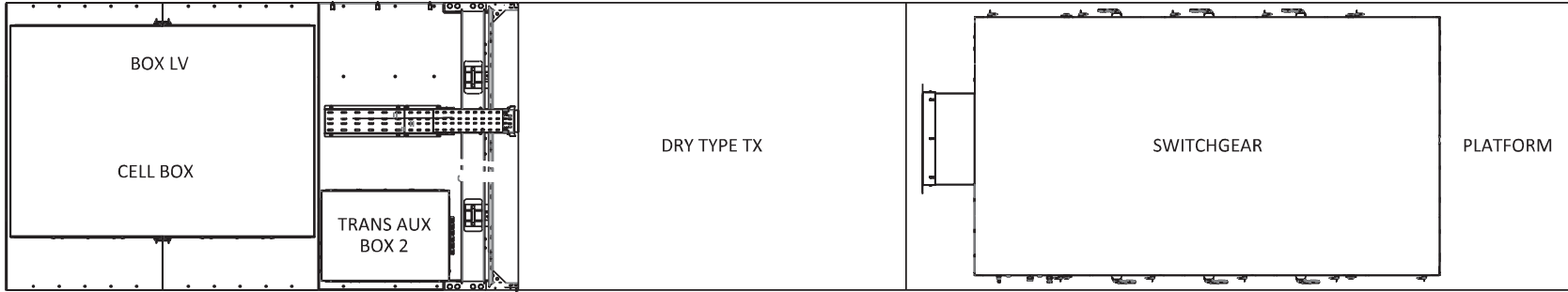
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DAINTREE RENEWABLE
ENERGY

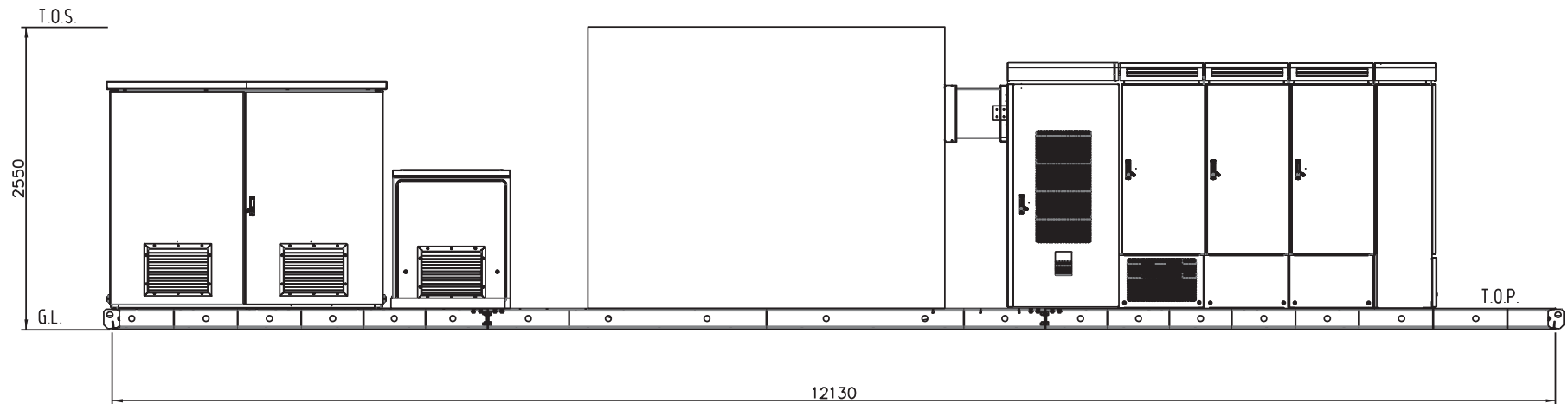
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MODULE DETAILS

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SHEET 1 OF 1	REVISION B
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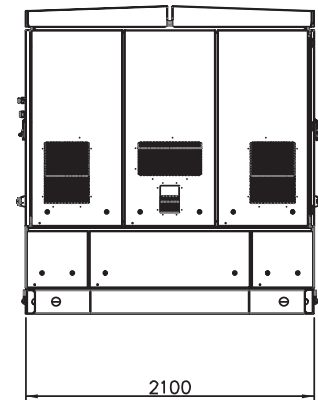
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TOP VIEW



FRONT VIEW
INVERTER UNIT
SCALE 1:25



END VIEW

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

REV	DATE	DETAILS	DRAWN	CHECKD	APPRVD	DRAWING No	REFERENCE DRAWING TITLE
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A	26/04/23	ISSUED FOR REVIEW	PMC	PZ	SC		



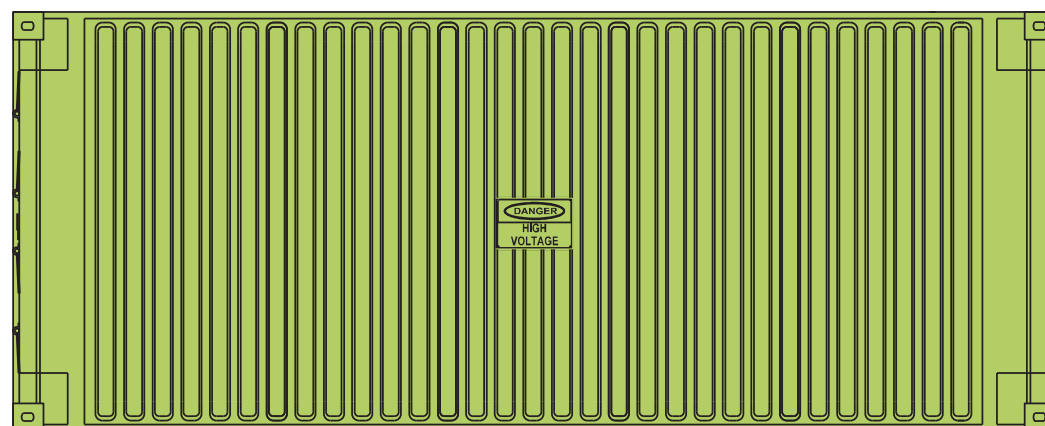
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DAINTREE RENEWABLE
ENERGY

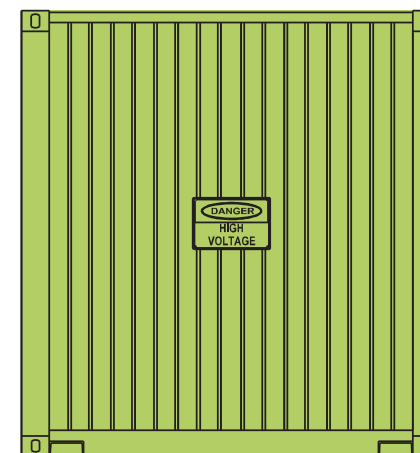
CENTRAL GENERATION FACILITY
SOLAR INVERTER SKID UNIT
GENERAL ARRANGEMENT

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SHEET 1 OF 1	REVISION B
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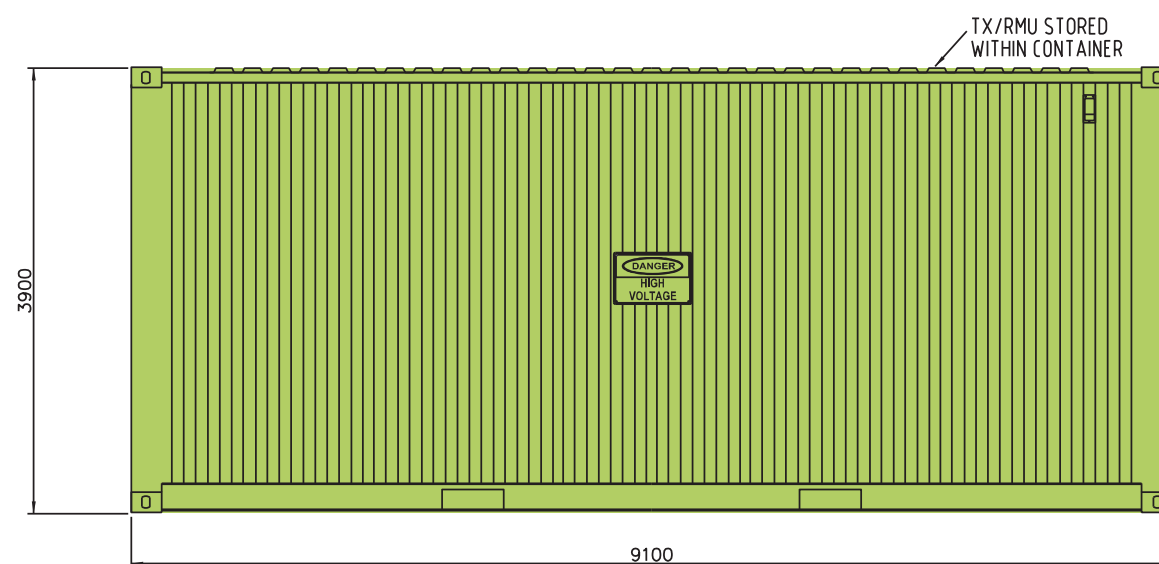
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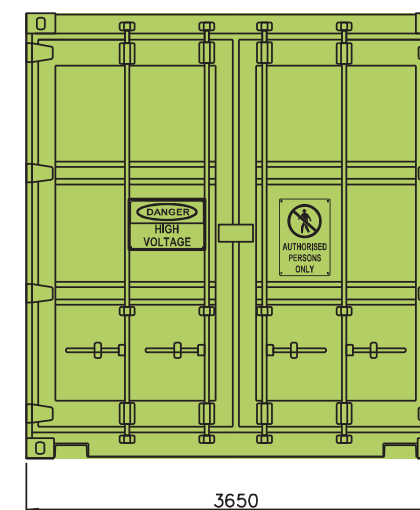
TOP VIEW



END VIEW



FRONT VIEW
TRANSFORMER / RING MAIN UNIT
SCALE 1:20



END VIEW

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

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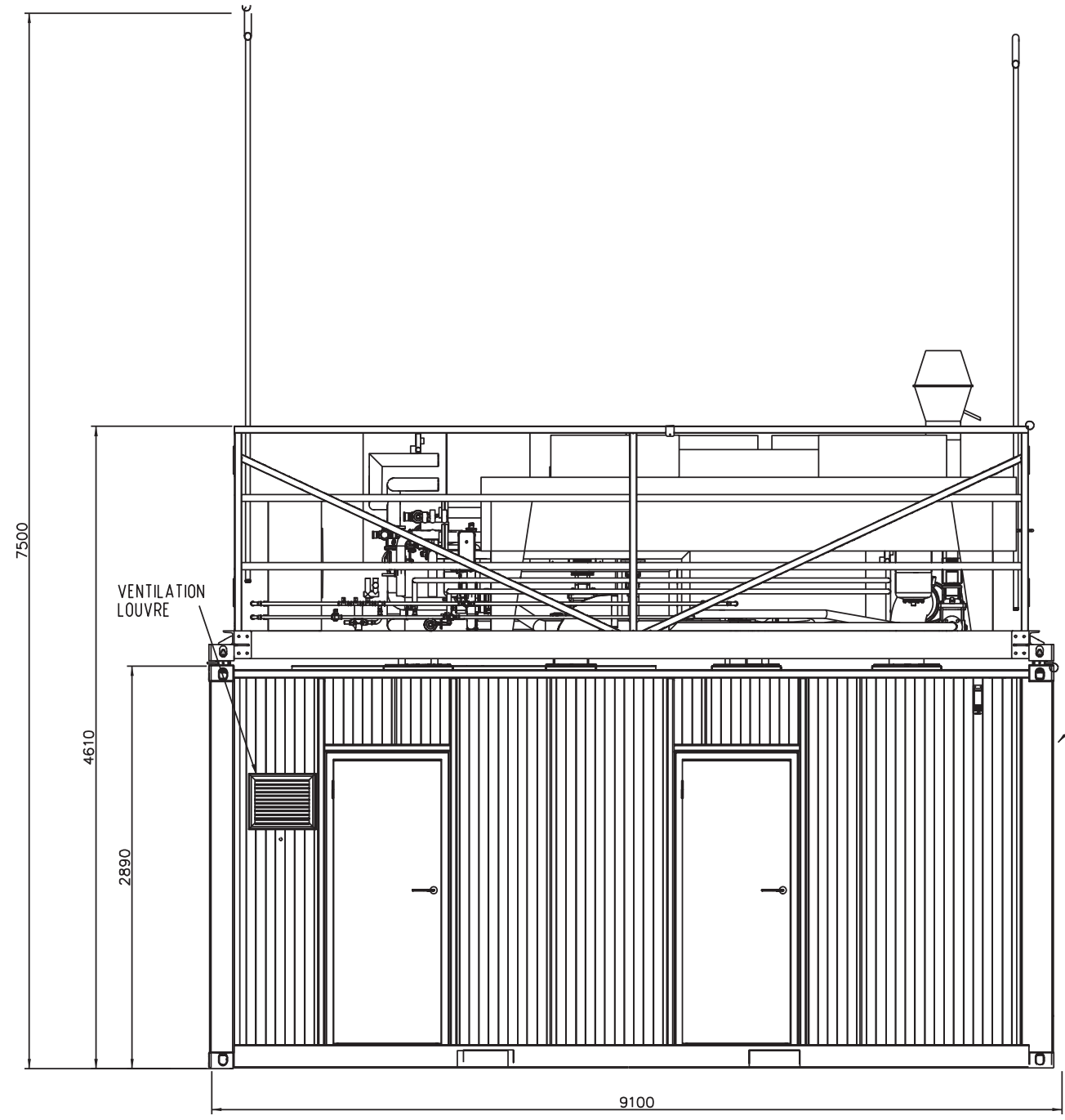


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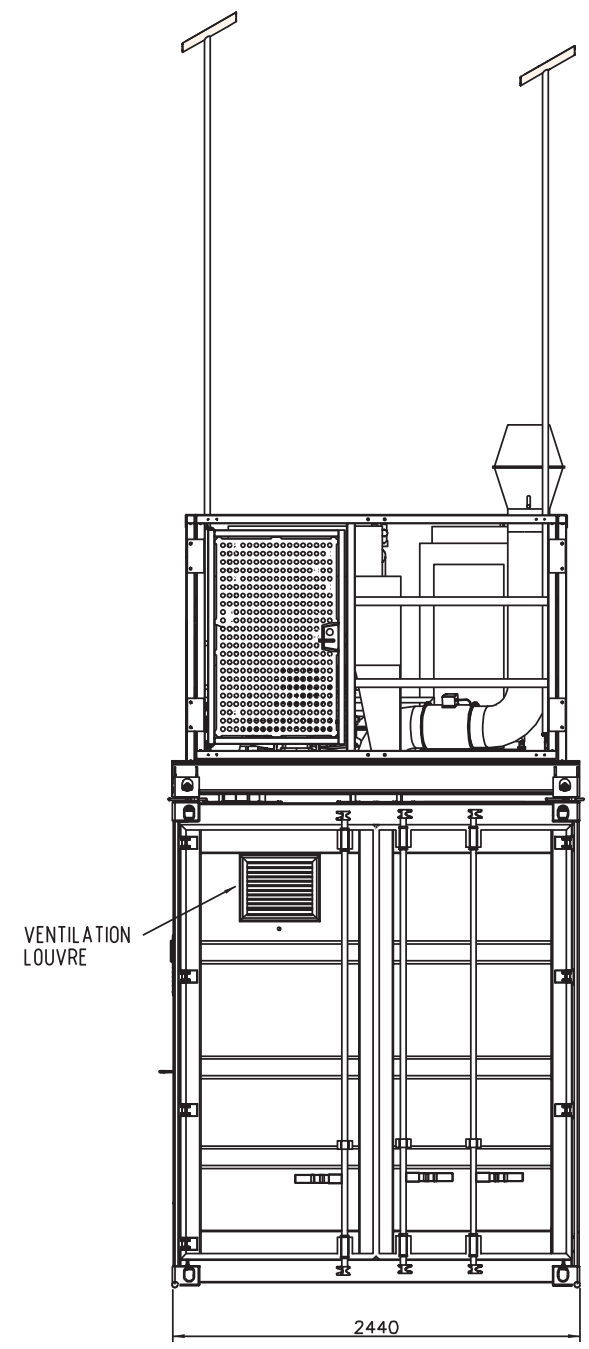
DAINTREE RENEWABLE
ENERGY

CENTRAL GENERATION FACILITY
TRANSFORMER / RING MAIN UNIT MODUL
DETAILS

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DRAWING NUMBER	
DRE-CIV-GAR-1011	
SHEET 1 OF 1	REVISION B
SCALE : AS SHOWN	A1



FRONT VIEW
ELECTROLYSER
SCALE 1:20



END VIEW

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

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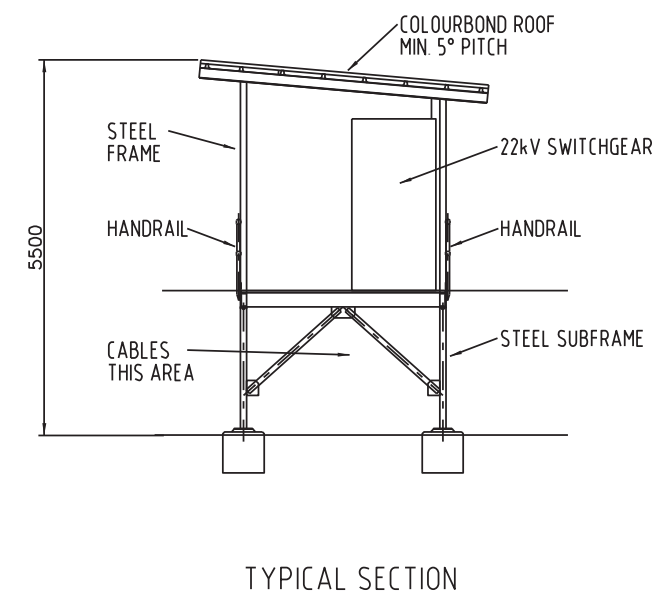
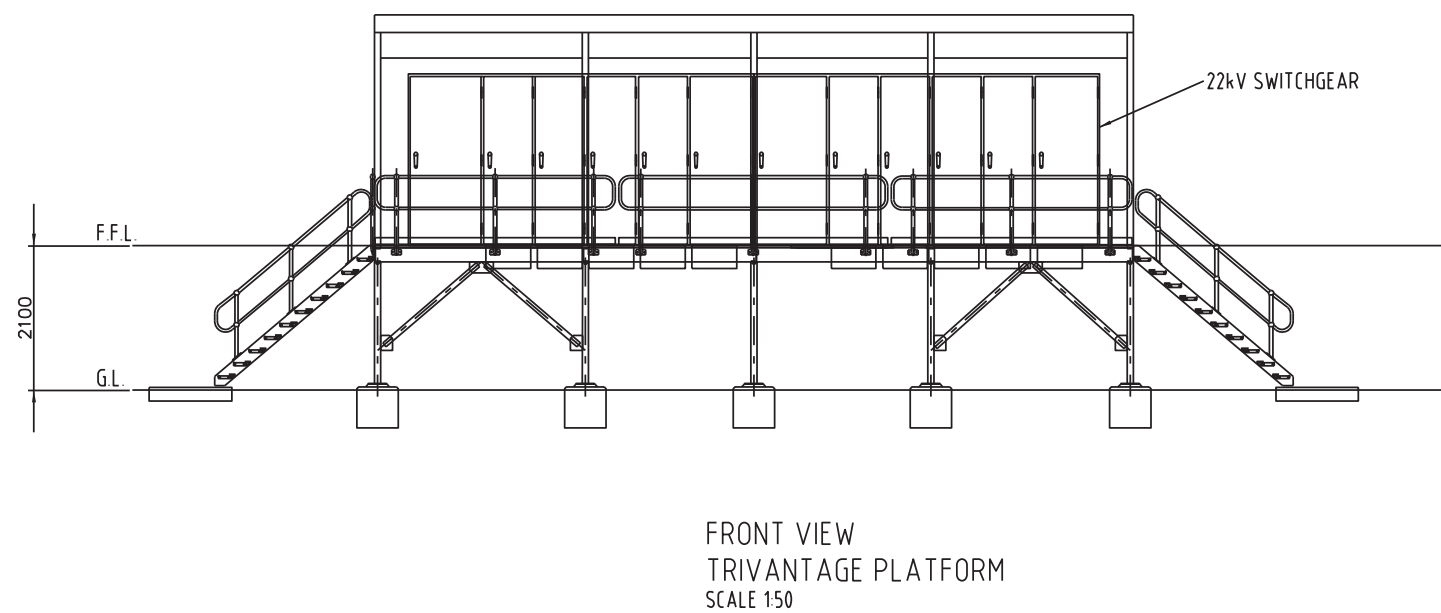
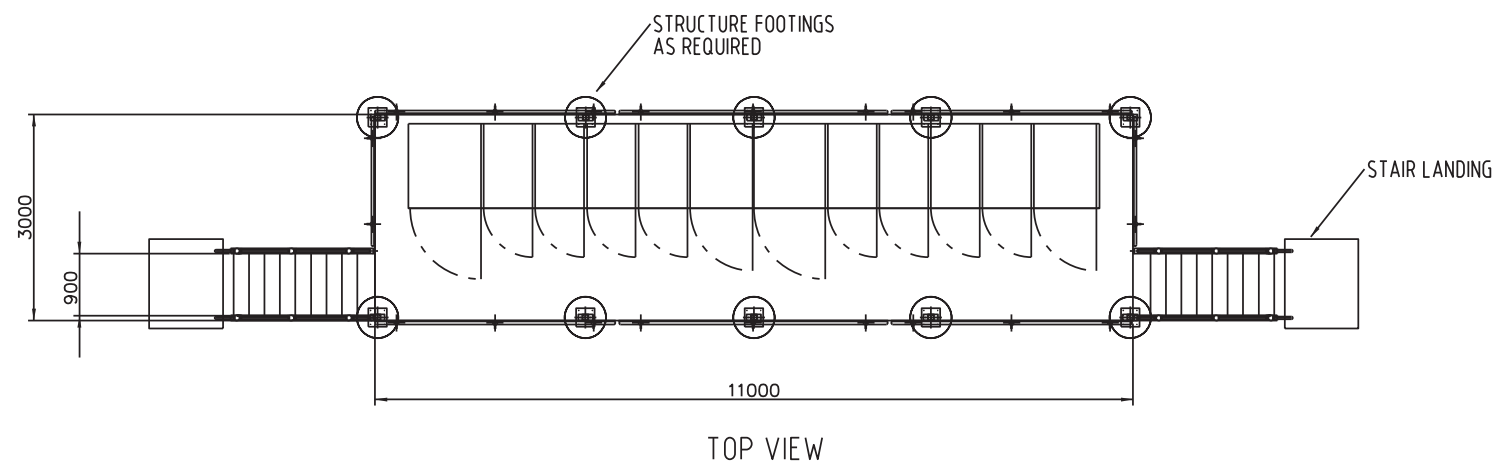
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DAINTREE RENEWABLE
ENERGY

CENTRAL GENERATION FACILITY
ELECTROLYSER SKID MODULE
DETAILS

PROJECT No:	ZW2022 11
DRAWING NUMBER	DRE-CIV-GAR-1012
SHEET 1 OF 1	REVISION B
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INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

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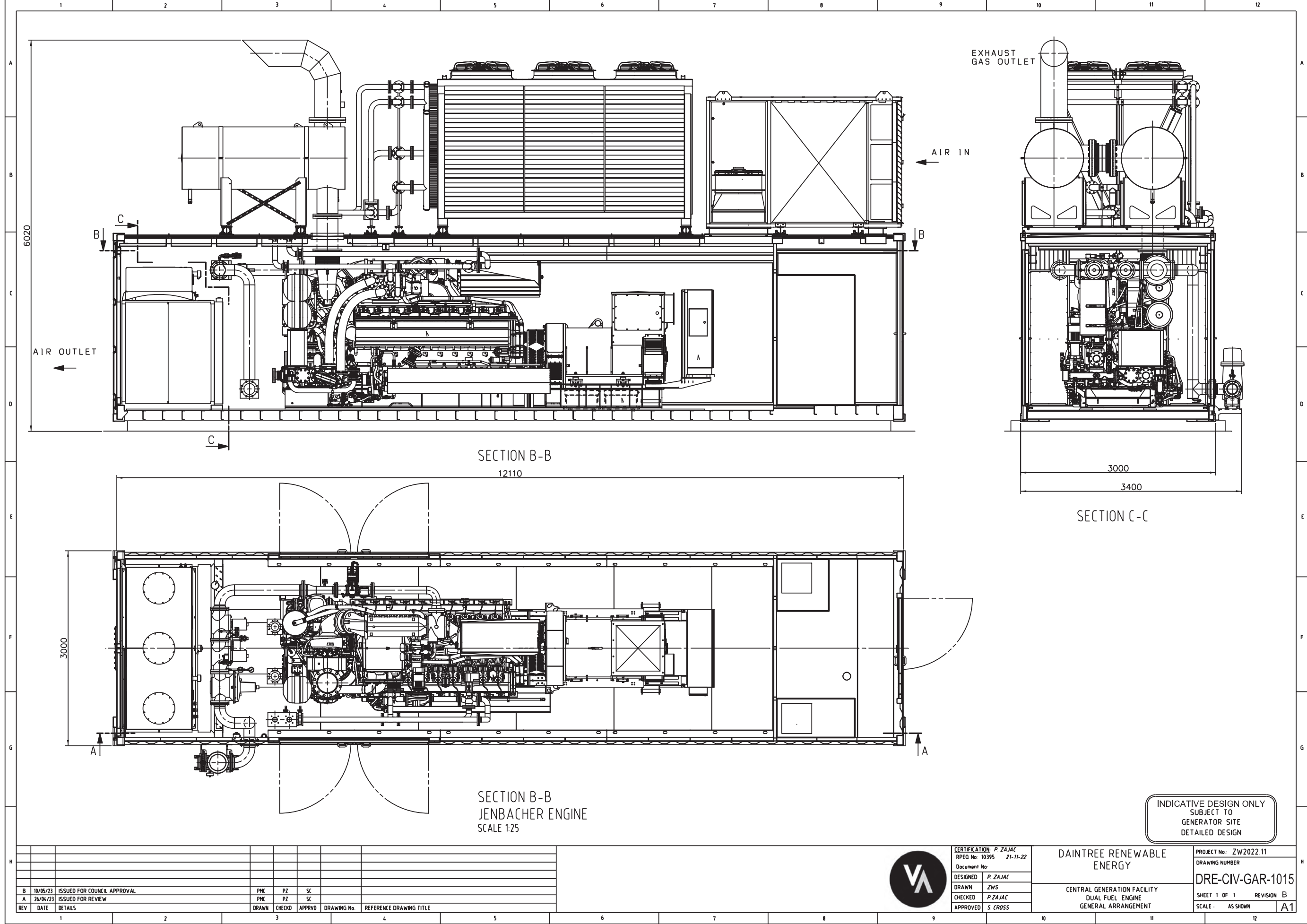


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DAINTREE RENEWABLE ENERGY
CENTRAL GENERATION FACILITY 22kV SWITCH GEAR PLATFORM GENERAL ARRANGEMENT

PROJECT No: ZW2022 11
DRAWING NUMBER
DRE-CIV-GAR-1014
SHEET 1 OF 1
REVISION B
SCALE: AS SHOWN

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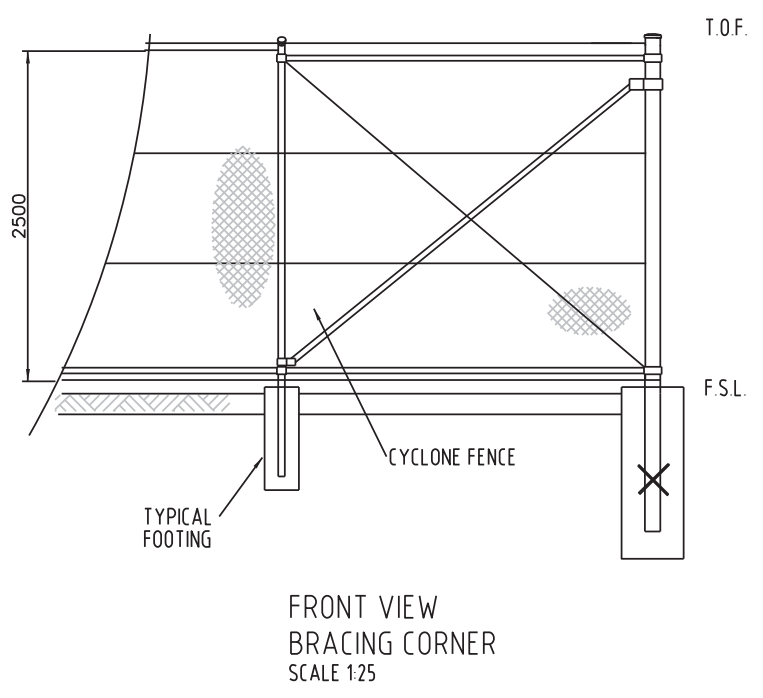
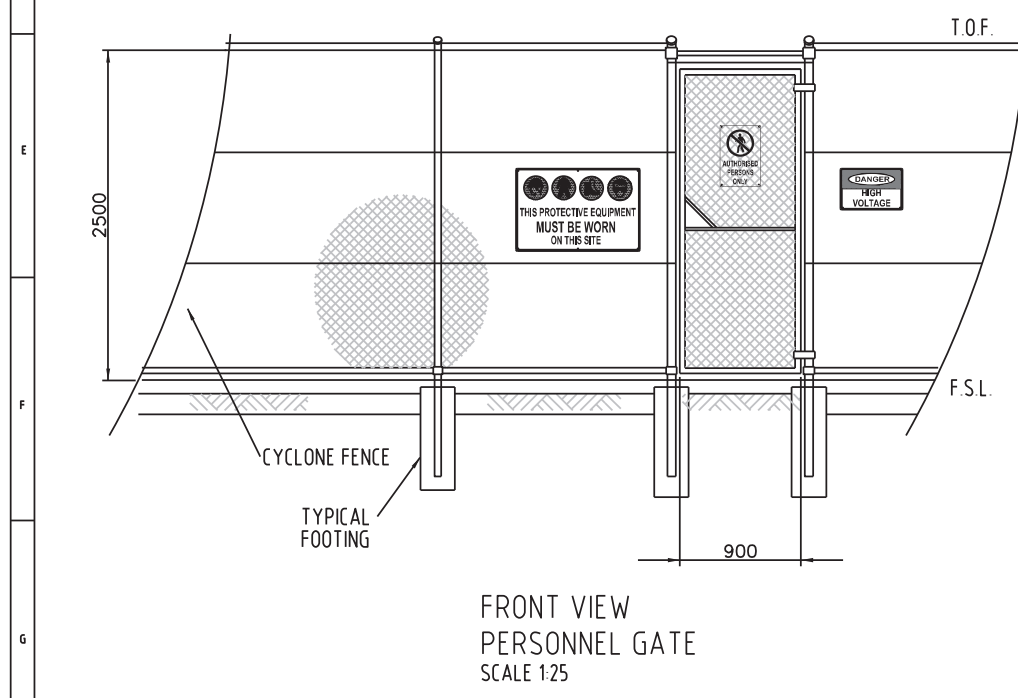
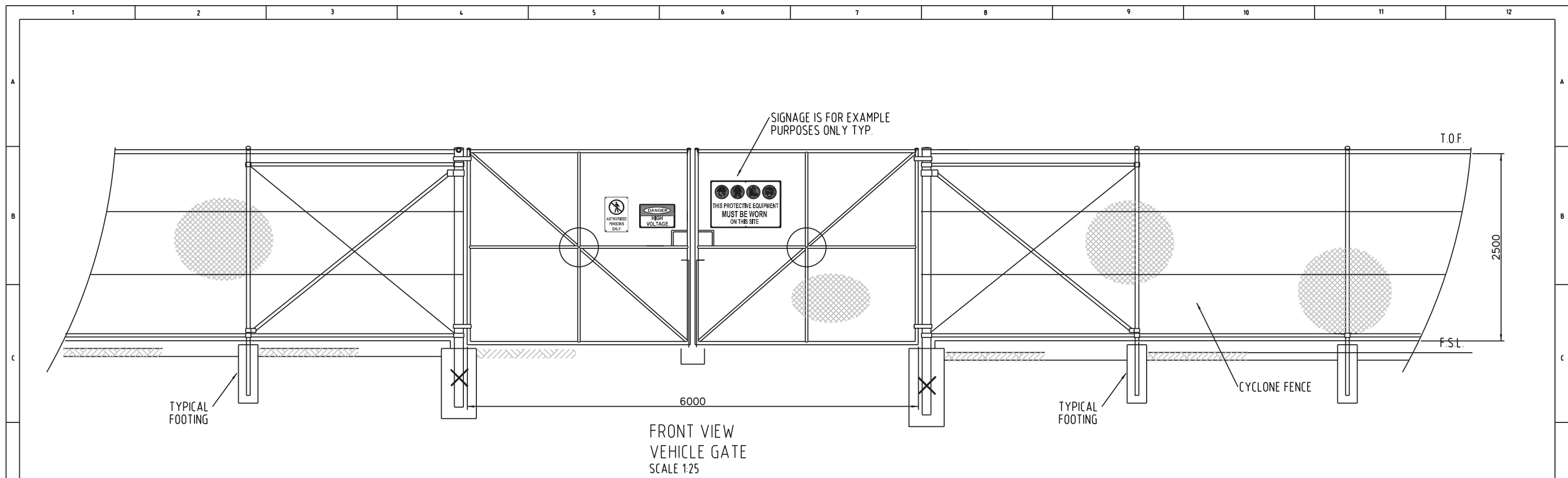


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DAINTREE RENEWABLE ENERGY
CENTRAL GENERATION FACILITY
DUAL FUEL ENGINE
GENERAL ARRANGEMENT

PROJECT No:	ZW2022 11
DRAWING NUMBER	DRE-CIV-GAR-1015
SHEET 1 OF 1	REVISION B
SCALE:	AS SHOWN

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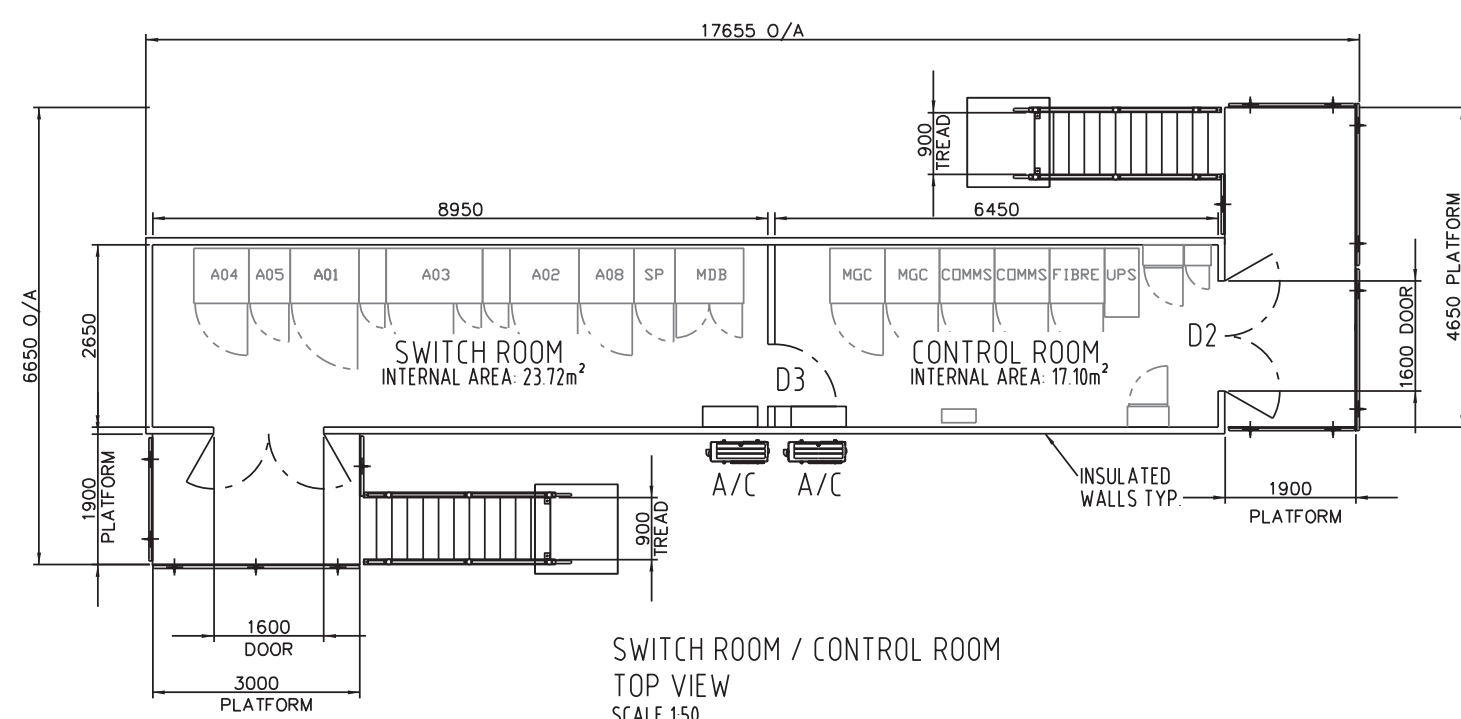


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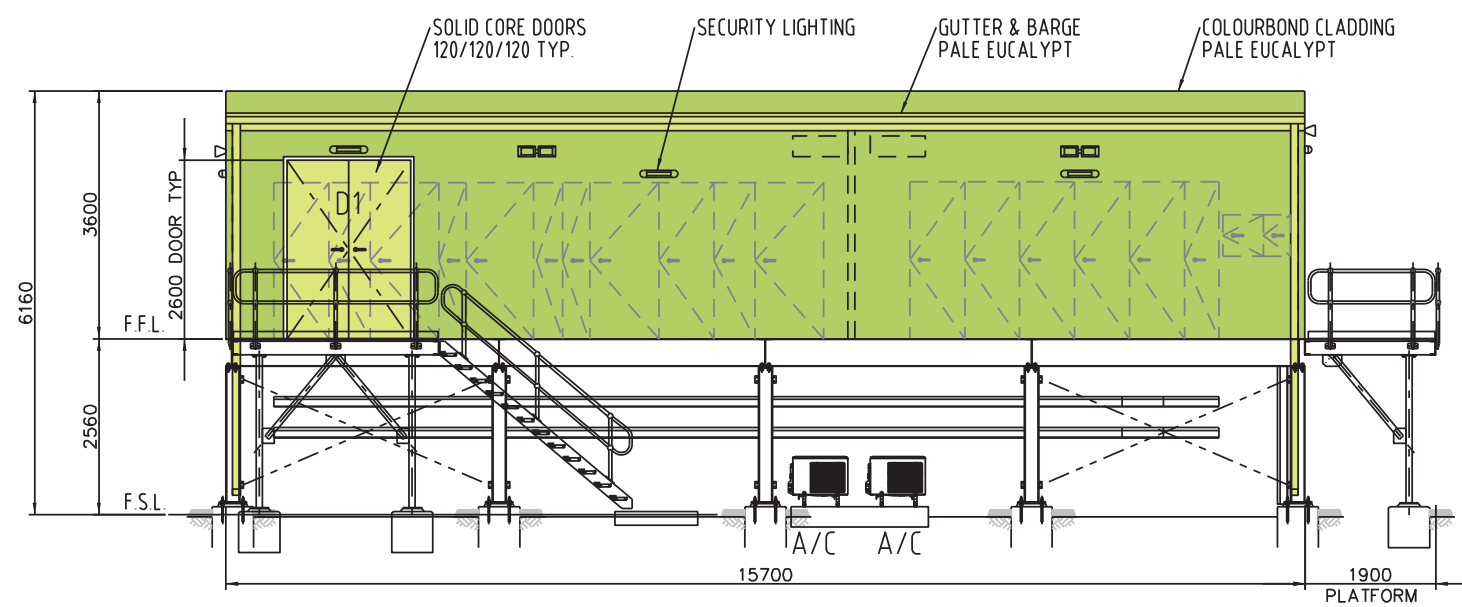
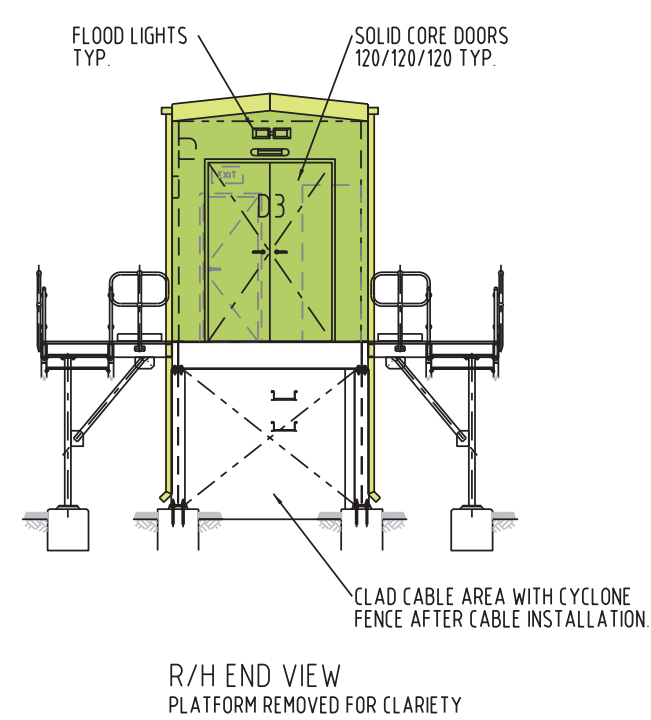
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CENTRAL GENERATION FACILITY
FENCE DETAILS

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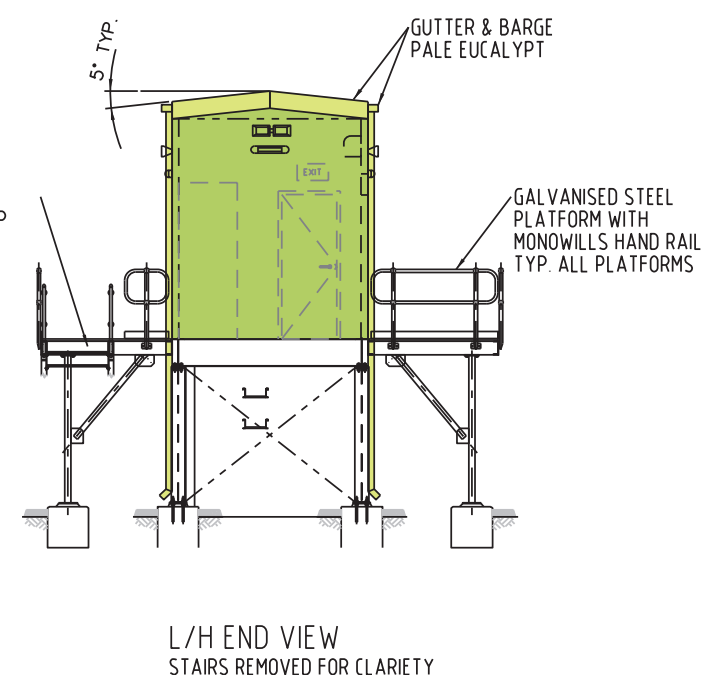


SWITCH ROOM / CONTROL ROOM
TOP VIEW
SCALE 1:50



FRONT VIEW

GALVANISED STEEL STAIRS WITH NON-SLIP STAIR TREADS AND MONOWILLS HAND RAIL TYP. ALL STAIRS.



DOOR SCHEDULE:
D1 - 2600H X 1600W SOLID CORE FRL 120/120/120, EXTERNAL
D2 - 2100H X 920W SOLID CORE FRL 120/120/120, INTERNAL
D3 - 2600H X 1600W SOLID CORE FRL 120/120/120, EXTERNAL

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

REV	DATE	DETAILS	DRAWN	CHECKD	APPRVD	DRAWING No	REFERENCE DRAWING TITLE
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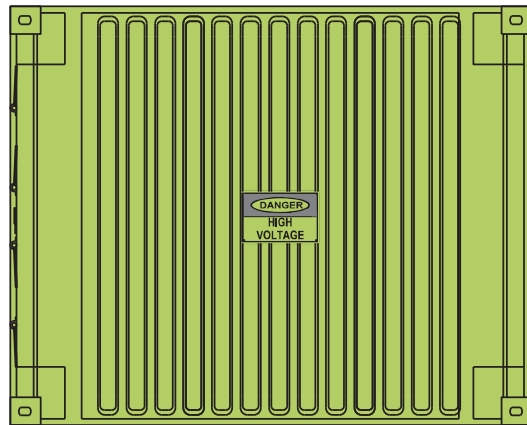
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DAINTREE RENEWABLE
ENERGY

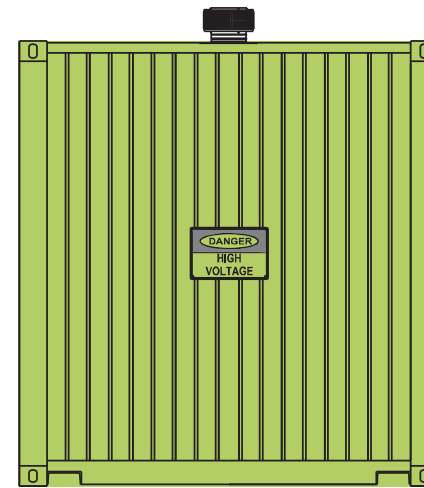
CENTRAL GENERATION FACILITY
SWITCHROOM / CONTROL ROOM
DETAILS

PROJECT No	ZW2022 11
DRAWING NUMBER	DRE-CIV-GAR-1017
SHEET 1 OF 1	REVISION B
SCALE	AS SHOWN

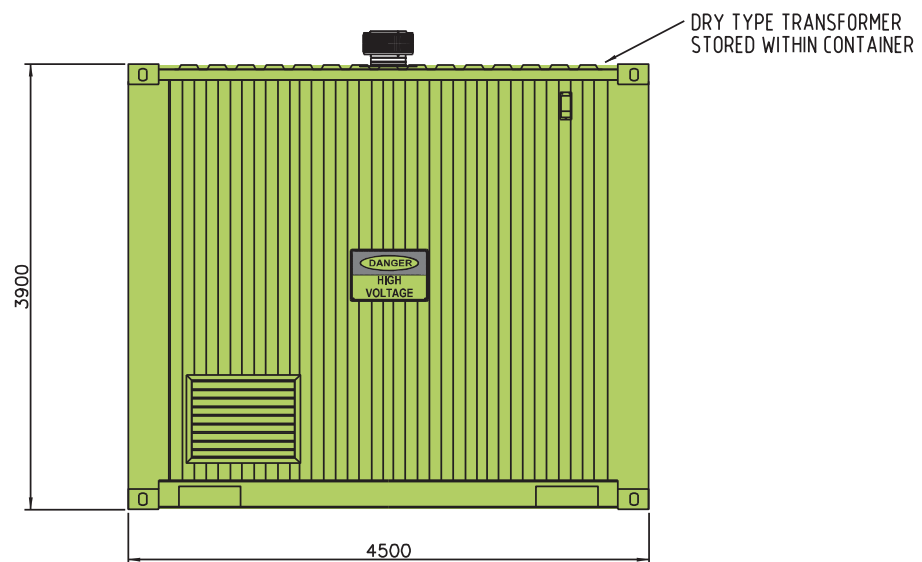
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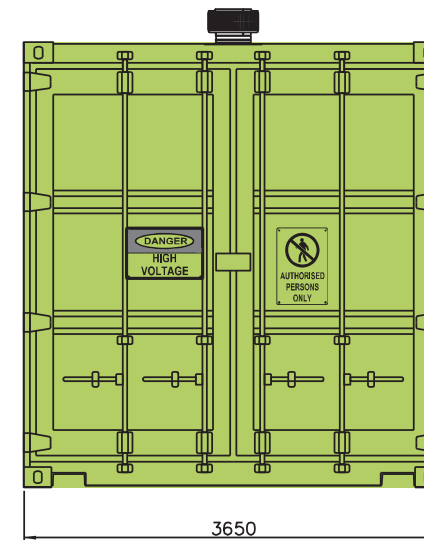
TOP VIEW



END VIEW



FRONT VIEW
2.5MVA 22kV TO 0.4kV TX UNIT
SCALE 1:20



END VIEW

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

REV	DATE	DETAILS	DRAWN	CHECKD	APPRVD	DRAWING No	REFERENCE DRAWING TITLE
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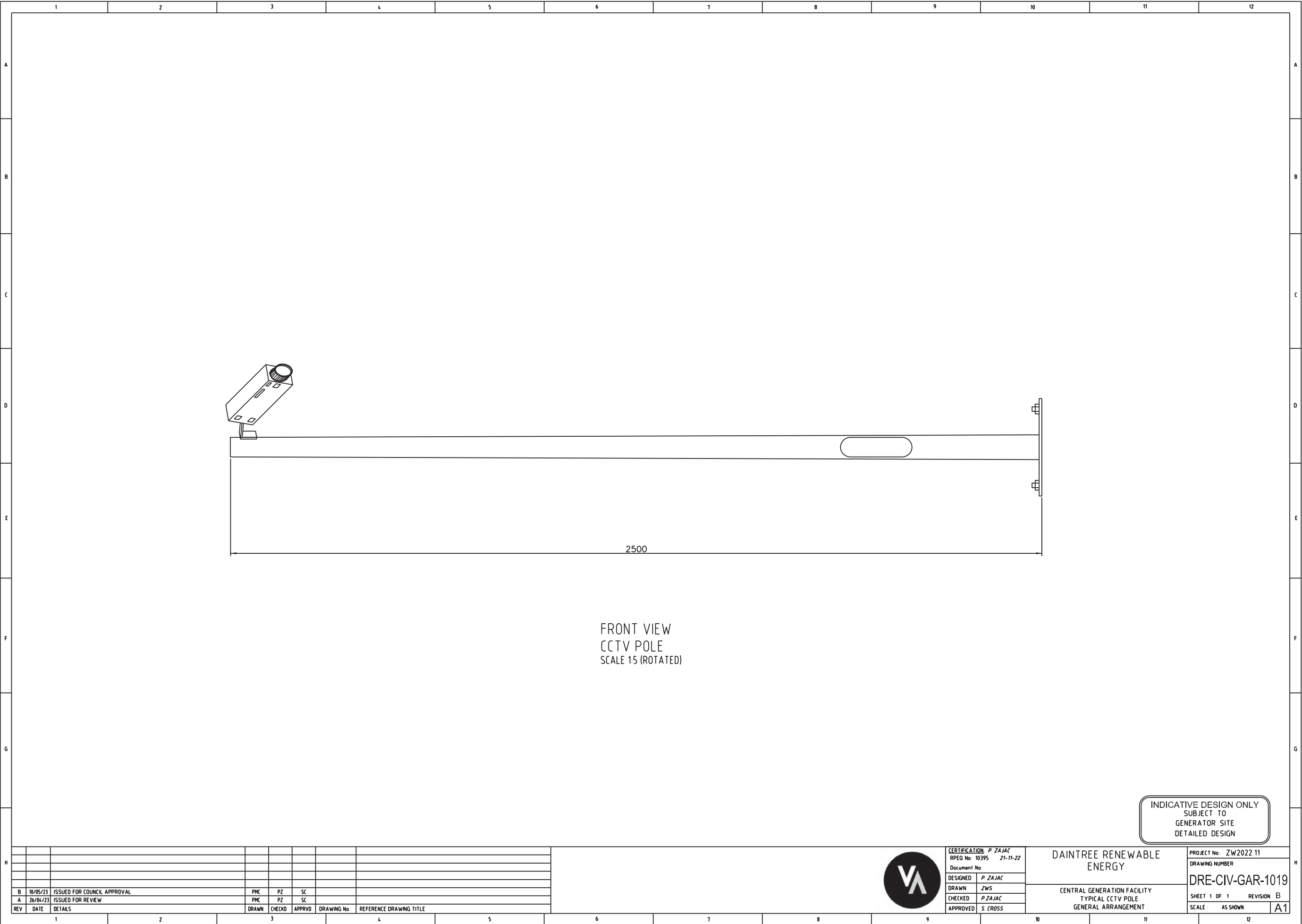


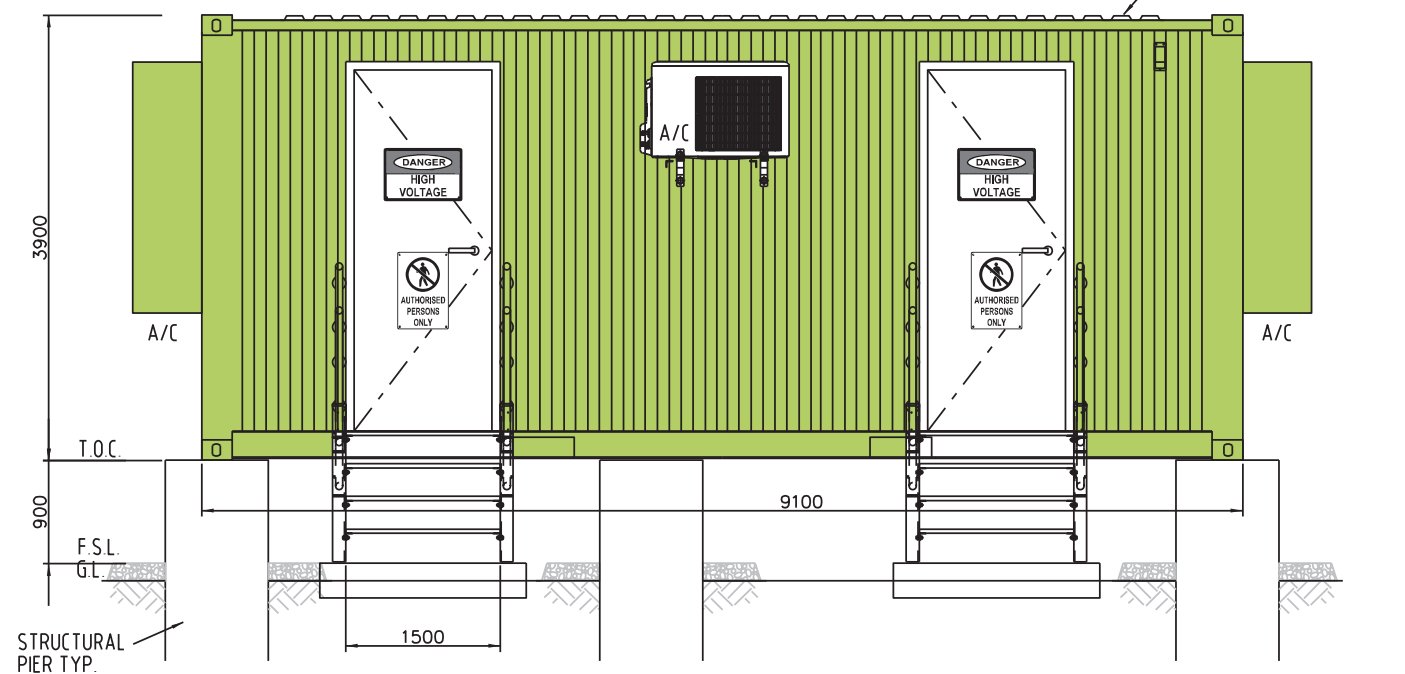
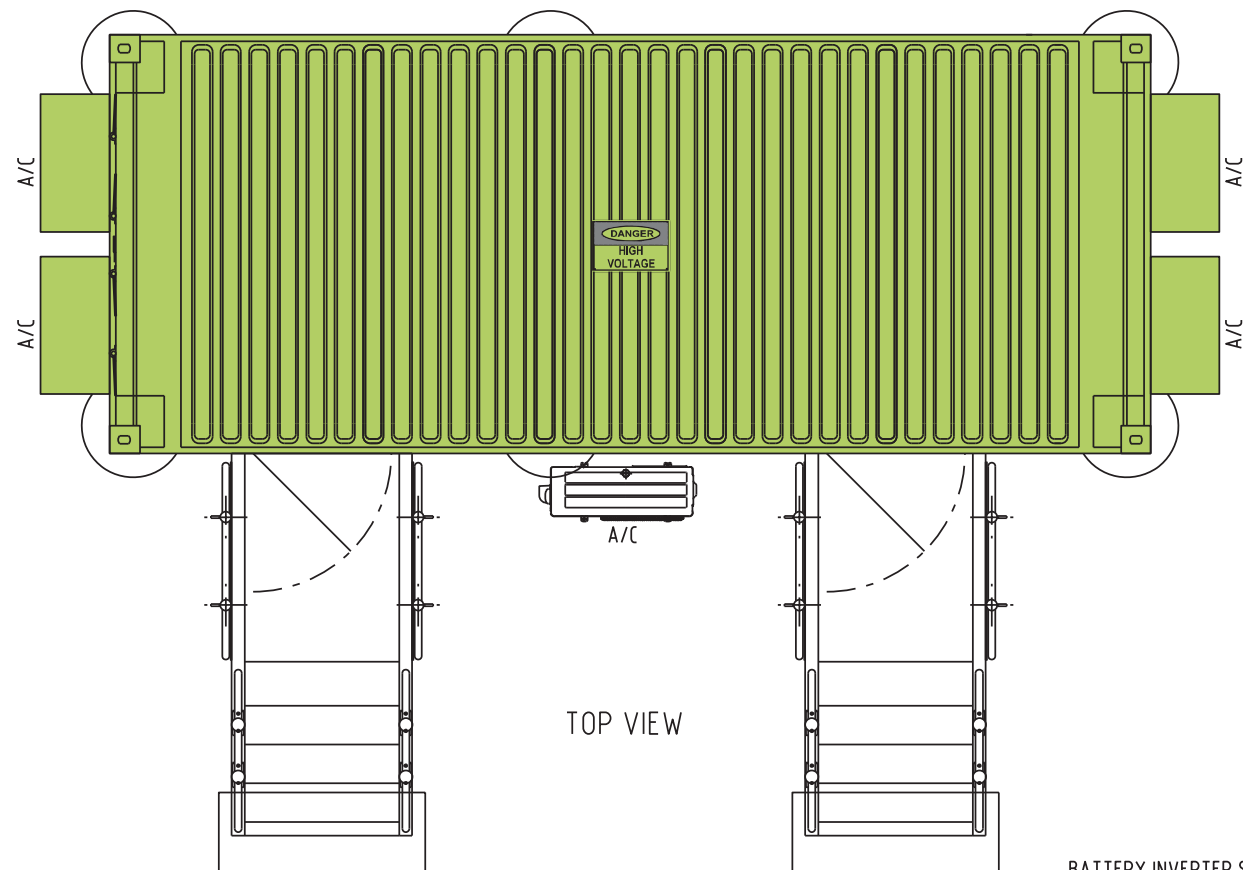
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DAINTREE RENEWABLE ENERGY
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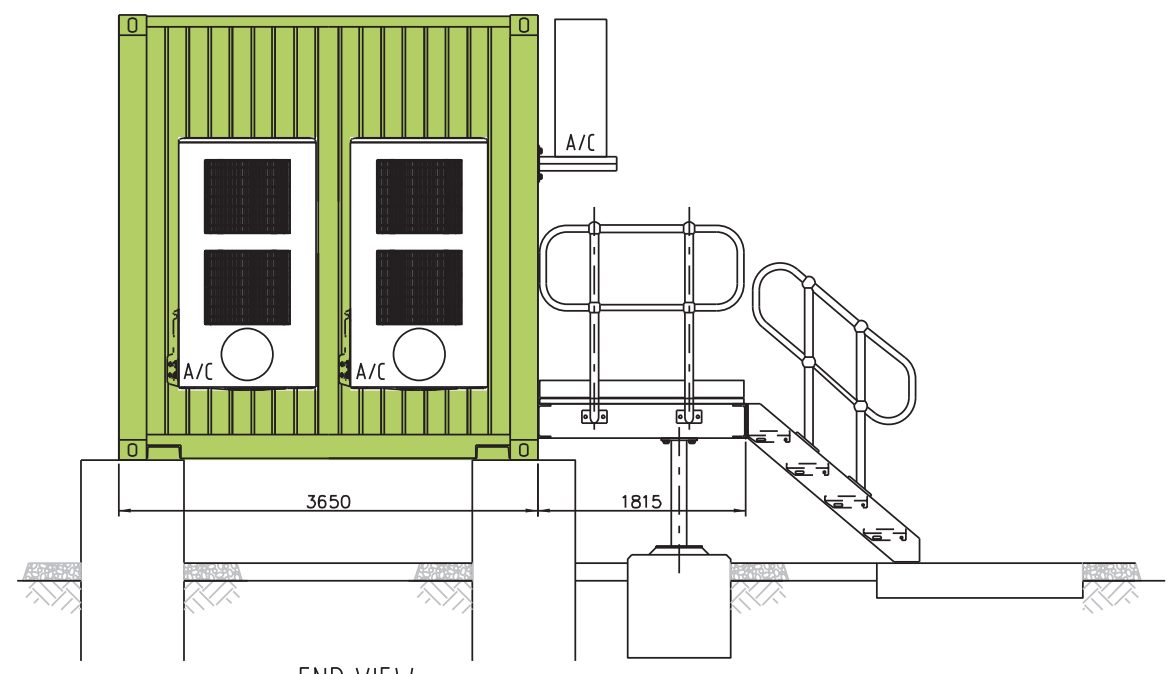
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DRAWING NUMBER	DRE-CIV-GAR-1018
SHEET 1 OF 1	REVISION B
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FRONT VIEW
BATTERY ENERGY STORAGE SYSTEM (BESS) UNIT
SCALE 1:20



END VIEW

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN

REV	DATE	DETAILS	DRAWN	CHECKD	APPRVD	DRAWING No	REFERENCE DRAWING TITLE
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RPEO No	10395
Document No	21-11-22
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CHECKED	P ZAJAC
APPROVED	S CROSS

DAINTREE RENEWABLE ENERGY
CENTRAL GENERATION FACILITY BATTERY ENERGY STORAGE SYSTEM (BESS) UNIT INVERTER MODULE GENERAL ARRANGEMENT

PROJECT No	ZW2022 11
DRAWING NUMBER	DRE-CIV-GAR-1020
SHEET 1 OF 1	REVISION B
SCALE	AS SHOWN

A1



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



IN ACCORDANCE WITH LANDCOM 'BLUE BOOK' SD6-11 MESH AND GRAVEL INLET FILTER



SCALE N.T.S.



SCALE N.T.S.



BLOCK
SCALE: N.T.S.

INDICATIVE DESIGN ONLY
SUBJECT TO
GENERATOR SITE
DETAILED DESIGN



CERTIFICATION: <i>P. ZAJAC</i> RPEQ No: 10395 21-11-22 Document No:	
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DRAWN	<i>ZWS</i>
CHECKED	<i>P. ZAJAC</i>
APPROVED	<i>S. CROSS</i>

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DRAINAGE DETAILS

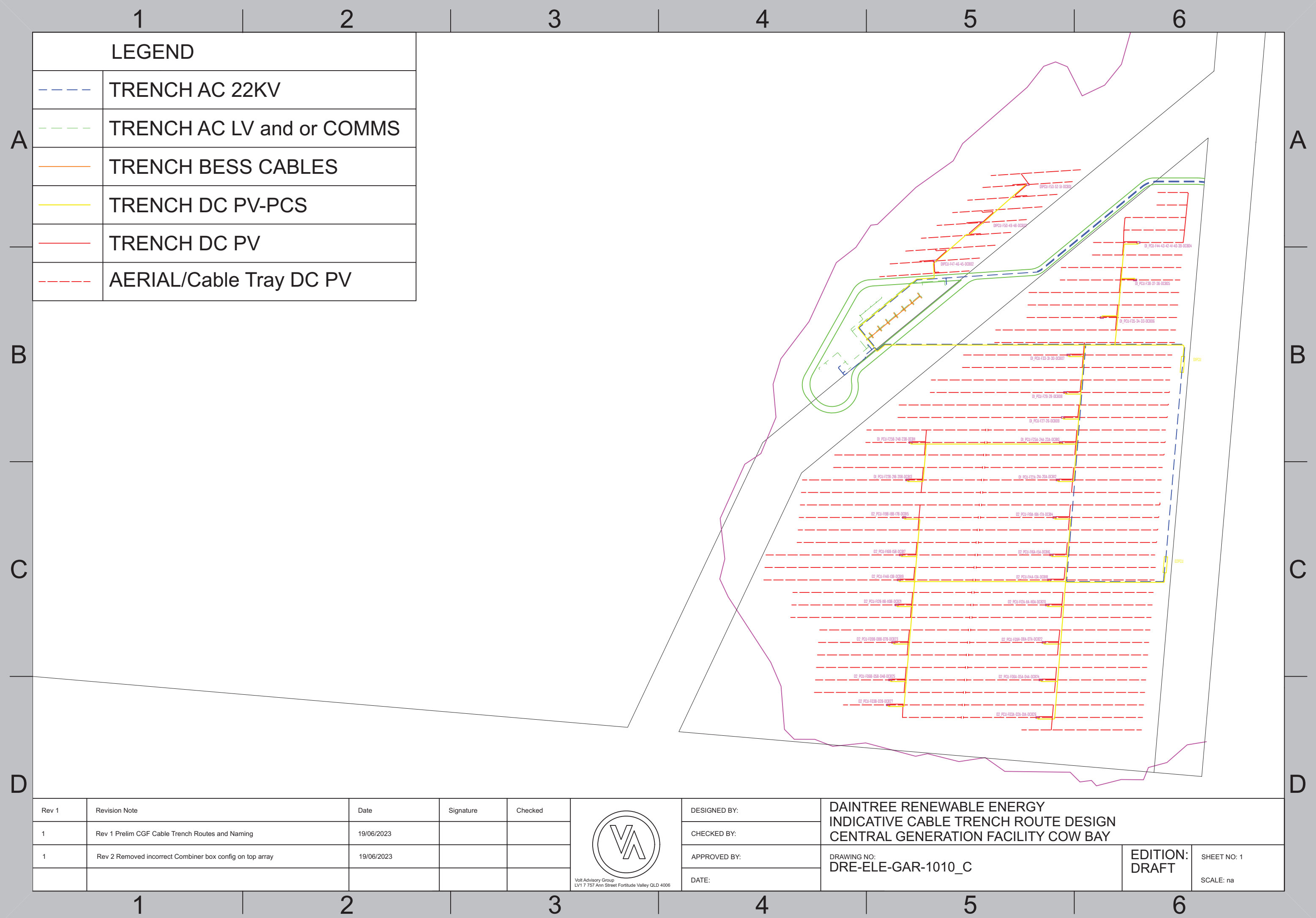
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DRAFTING NUMBER


DRE-CIV-GAR-1021

SHEET 1 OF 1 REVISION A

SHEET 1 OF 1		REVISION A
SCALE	AS SHOWN	A 1



Rev	Revision Note	Date	Signature	Checked
1	Rev 1 Prelim CGF Cable Trench Routes and Naming	19/06/2023		
1	Rev 2 Removed incorrect Combiner box config on top array	19/06/2023		



Volt Advisory Group
LV1 7 757 Ann Street Fortitude Valley QLD 4006

DESIGNED BY:

CHECKED BY:

APPROVED BY:

DATE:

DAINTREE RENEWABLE ENERGY
INDICATIVE CABLE TRENCH ROUTE DESIGN
CENTRAL GENERATION FACILITY COW BAY

DRAWING NO:
DRE-ELE-GAR-1010_C

EDITION:
DRAFT

SHEET NO: 1
SCALE: na

Appendix F – Contaminated Land and Environmental Management Register Searches



Department of Environment and Science (DES)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454, Brisbane QLD 4001, AUSTRALIA
www.des.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Andrew Small
PO Box 724
EDGE HILL QLD 4870

Transaction ID: 50823041 EMR Site Id: 23 November 2022
Cheque Number:
Client Reference:

This response relates to a search request received for the site:

Lot: 5 Plan: BK157130
174 BUCHANAN CREEK RD
COW BAY

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

Appendix G – Project Environmental Management Plan

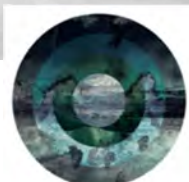


Volt Advisory

Environment Management Plan

Daintree Microgrid Project

July 2023



environmentPACIFIC

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PO Box 724 Edge Hill 4870
T: +61409494183 E: info@environmentpacific.com*

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Daintree Microgrid –Construction Environment Management Plan

Document Status


Rev	Author	Signature	Reviewer	Signature	Date
A	A Small	AS	K Keane	KK	29/11/2022
B	A Small		External	External	22/04/2023

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Attachment Index

Attachment A Volt Advisory Environmental Policy

Attachment B Environmental Complaints Template

1. Introduction

1.1 Project Background

The Daintree Microgrid Project involves the construction of an 8 megawatt (MW) solar farm in Cow Bay and associated underground distribution network of approximately 56km of road reserve between Cow Bay and Cape Tribulation. Approximately half of the solar farm output will directly contribute to community electricity consumption, 40% will charge the 20 Megawatt hour (MWh) battery energy storage and 10% will charge the hydrogen storage system. There will be a liquified petroleum gas (LPG) powered backup generator.

Underground cables will be used to reticulate the distribution network between Cow Bay and Cape Tribulation beneath and beside the existing formed road surface. Approximately 69 kilometres (km) of cable will be required, with approximately 41 km of cable to be laid in trenches, and approximately 28 km of cables to be horizontally directionally drilled (HDD) beneath the road surface. The cable trench will be laid either via cable plow or small trenching excavator up to 300mm wide and to 1.25m depth. This will only be undertaken in areas beside the road where there is sufficient cleared width to accommodate trenching without vegetation disturbance. No trenches will remain open overnight. Trenching will only be that as required to lay cable during that working day, with all trenches completed and closed at the end of each day. There will be no earth stockpiling required for trenching.

In areas where trenching cannot be achieved, e.g. waterway crossings, particularly sensitive areas (e.g. wetlands between Cooper Creek and Thornton Beach) and to avoid vegetation clearing generally, the cable will be laid underground via HDD. This will require a drilling and draw through of cables in underground conduits up to 100mm in diameter to avoid vegetation clearing, passing beneath waterways, and to avoid exposure of potential acid sulphate soils.

The overall project comprises three components:

1. An 8MW solar farm to be located in Cow Bay
2. Approximately 68.9km of cables within 56km of road reserve (there will be doubling up of cables in some trenches/conduits) all underground, comprising a mix of cable trenching on road shoulders where there is sufficient width to avoid impacts on vegetation, and horizontal directional drilling (HDD), beneath the road surface and road shoulders in all other locations.
3. Above ground transformers and switchgear in self-contained 'kiosks' for stepping down voltage from main distribution line to household/business networks.

1.2 Location

A lease has been taken out over a portion of Lot 5 BK157130, Buchanan Creek Road, Cow Bay, 4873, Queensland (see Figure 1) for the solar farm. Access to the solar farm will be from Silkwood Road, off Buchanan Creek Road.

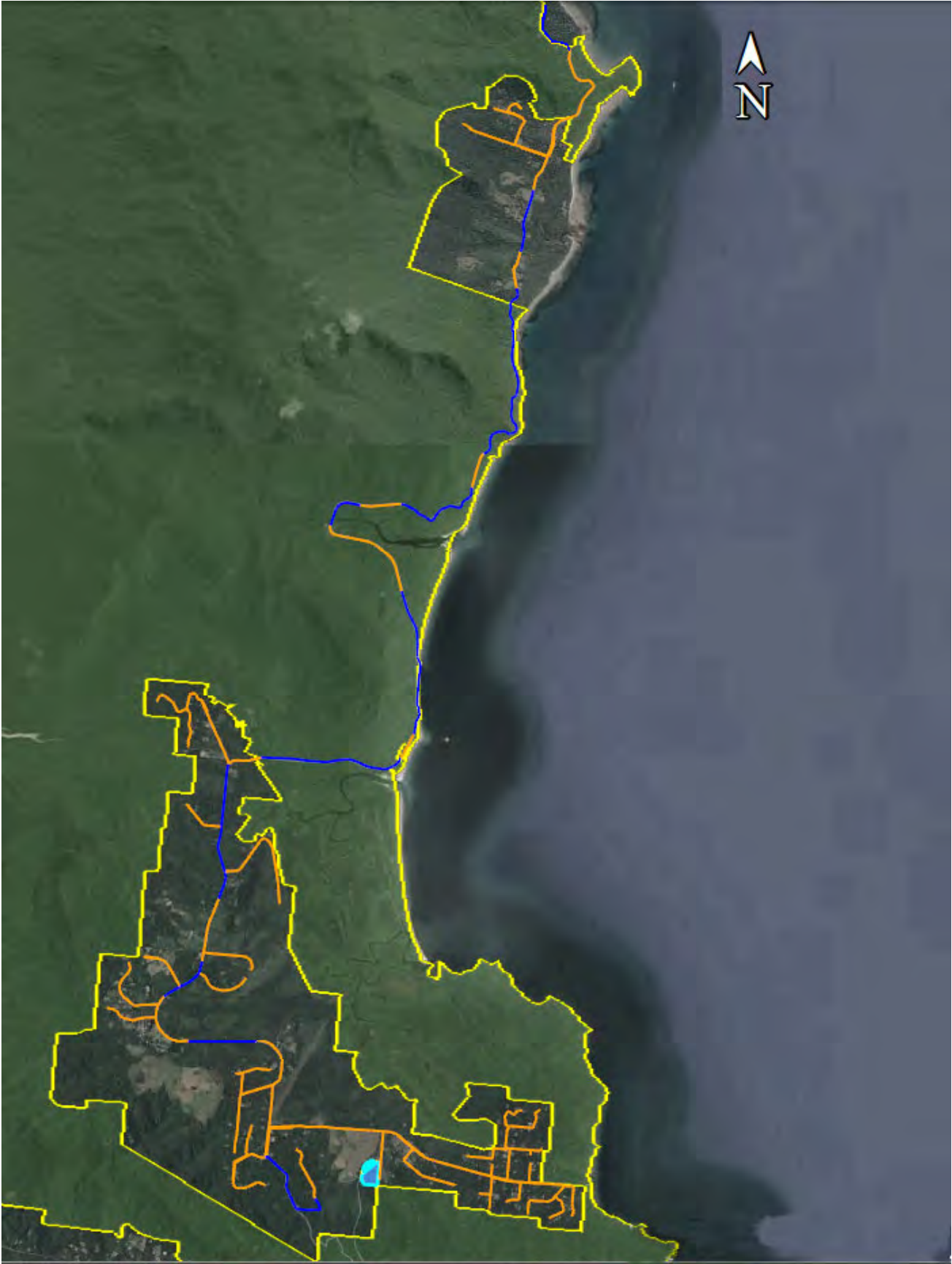
Figure 1 Lease Area



The cable distribution network will occupy all road reserves between (and including) Cow Bay to Cape Tribulation through a combination of trenching and HDD installation.

See Figure 2. Note: Yellow lines indicates WTWHA boundary, blue line indicative areas of HDD, and orange line proposed trenching alignments.

Figure 2 Cable Distribution Network



1.3 Purpose of this Environment Management Plan

The entirety of the Project Area comprises road reserves within the lowland Daintree between (and including) Cow Bay to Cape Tribulation and an approximate 8.5ha lease on lot 5 BK157130, Buchanan Creek Road, Cow Bay. Sections of the road reserve network along Cape Tribulation Road are within the Wet Tropics World Heritage Area (WTWHA) and a permit has been granted to the DMG project under s45 of the Wet Tropics Management Plan 1998 to place underground electricity cables within the road reserves (Zone C under the Wet Tropics Plan 1998) of the WTWHA.

The purpose of this EMP is to enable Volt Advisory (VA), and subsequently the Project Construction Manager (not yet appointed, but designated as PCM in this EMP) to fulfil their environmental duty-of-care obligations with respect to the installation of the cable networks within the road reserve network, and in the construction of the solar farm. This EMP addresses environmental requirements for the project which includes electrical equipment installation within the road reserve for which DSC is trustee, and the solar farm site, over which VA has secured a lease options agreement.

This EMP will outline how activities associated with operational works within the road reserves and the solar farm generation site will be managed to minimise potential harm to surrounding and receiving environments. This EMP will apply to all aspects of the cable laying network, and for the solar farm site (generally).

The aim of this EMP document is to identify and assist in the implementation of:

- Effective and efficient environmental management throughout the construction/operational phases for VA and the PCM.
- Compliance with all regulatory requirements, including those for fulfilling conditions issued under the Douglas Shire Council Planning Scheme (2018), Queensland *Planning Act 2016* and conditions on the approval under the Wet Tropics Plan 1998 and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Identify practical and achievable Environmental Management Strategies for implementation in this project, to have comprehensive monitoring, auditing, reporting and control of site impacts during construction of the various Daintree Microgrid Project components.

This EMP contains:

- Background and details of the works to be undertaken
- Requirements and compliance measures as identified for WTMA requirements
- VA and the PCM Environmental Obligations
- Environmental Elements to be included in the final Construction EMP for the DMG project..

2. Roles and Responsibilities

2.1 Responsibility Hierarchy

To achieve the overall objective of sound environmental management and construction works with the least possible impact on the environment, a clear implementation and management structure is required.

The following section provides an overview of the Contractors minimum implementation structure for the project relating to environmental responsibilities. Specific roles and responsibilities shall be included in duty statements and contracts between VA and contractors.

Identification of the hierarchy is presented below, with details on roles and responsibilities following.

2.2 Project Manager

Volt Advisory are the Project Manager for the Daintree Microgrid project, and are the project proponents and applicants for all regulatory requirements. VA is a registered Electricity Entity (special license) under the *Electricity Act 1994*. DSC are trustees for the road reserve within which the cable network and ancillary infrastructure will be constructed. VA hold a lease over the solar farm site with entire responsibility for all works within this area

- VA are an authorised entity under the *Electricity Act 1994* and subsequently hold ultimate responsibility for the performance of the environmental outcomes of the project as holders of the relevant permits/approvals.
- As project proponents and holders of the permits/approvals, VA are responsible for providing annual return information on permits and approval conditions, including notification of incidents, mitigation/remedial measures employed and any other regulatory information required by permit conditions.
- VA are the primary point of contact for any regulatory requirement, including notification to agencies, of any environmental aspect that has, or has the potential, to have significant adverse impacts on the environmental values of the WTWHA.
- VA will be a signatory to a Cultural Heritage Management Plan to be prepared by Jabalbina Aboriginal Corporation representing the Eastern Kuku Yalanji. Subsequently VA are required to comply with all notification and cultural heritage engagement requirements under the *Aboriginal Cultural Heritage Act 2003*, Daintree National Park Management Plan 2019 and the ILUA (QI2006/026)
- VA are responsible for negotiation, identification and settlement of all approval conditions for the project as set by Commonwealth and/or Queensland Government regulatory agencies and the Douglas Shire Council
- VA will review and approve the final Construction Environmental Management Plan in accordance with approval conditions for the project as set by the Commonwealth and/or Queensland Government regulatory agencies and Douglas Shire Council.
- VA (and/or their contractors) are to provide a Traffic Management Plan to DSC for approval prior to finalisation of any contract awards

2.3 Project Construction Manager

An overall Project Construction Manager (PCM) has not yet been appointed by VA (as the overall Project Proponent). The PCM shall maintain ultimate responsibility for the provision of suitable resources (e.g. financial, personnel, etc.) to ensure that construction works comply with all applicable legal requirements and best practice. PCM shall support all project personnel in the development and implementation of this EMP. The PCM may delegate responsibilities to appropriately qualified personnel where appropriate.

PCM responsibilities include (but are not limited to):

- Obtain any other civil approvals from the relevant regulatory agencies and ensure that all personnel operate in accordance with the EMP, approvals and legislative requirements.
- The above requires the following:
 - Review and submission of the ESCP to VA prior to construction
 - Preparation of a Traffic Management Plan to provide to VA prior to mobilisation
- Update this current EMP with conditions as may be issued on approvals and submit to VA for review and approval. This is to include a final Erosion and Sediment Control Plan based on construction methodologies and permit/approval conditions (as above).
- Ensure that all construction personnel are familiar with the EMP and are aware of their environmental responsibilities.
- Ensure necessary guidance and advice is provided to all personnel with regard to environmental management requirements.
- Ensure staff are appropriately qualified and trained regarding the requirements and responsibilities of the EMP.
- Provide for a site induction (which includes environmental responsibilities) that is mandatory for all staff and contractors.
- Ensure that all relevant licenses/permits/approvals are in place prior to any works being undertaken (if required).
- Monitor and review (where required) environmental performance during construction works of the project.
- Where necessary, coordinate and/or assist in the response to environmental incidents through implementation of corrective actions.
- Report environmental incidents to VA, and the relevant Administering Authority, including, DSC, WTMA, DES/QPWS, DAF and DNR where incidences are of an immediate and significant threat to environmental values.
- Record and maintain a database detailing environmental incidents and non-conformances including corrective actions taken.

2.4 Project Site Supervisor

The Project Site Supervisor (PSS) may be VA or a suitably qualified nominated Contractor. The Project Site Supervisor is responsible for

- Implementing and complying with this EMP, any regulatory approval conditions, Australian Standards and any relevant Code of Practice and/or Industry Standard.

- Provide a site induction (which includes environmental responsibilities) to all staff involved in construction works.
- Day to day waste management, including provide portable toilets onsite (if required) and ensure that maintenance and disposal of waste is conducted by a licensed contractor as required.
- Monitoring requirements as may be established as a Management Plan element of this EMP, including day-to-day inspections of ESCP provisions, audits and any other regular periodic inspections or assessments as required in this EMP and as conditions on approvals/permits.
- Ensure all vehicles arriving onsite utilise the designated entry/exit points and parking area.
- Ensure that all equipment is fuelled, maintained and 'fit for purpose' for the required task prior to arriving at the site.
- Notify VA of environmental incidents and corrective actions taken (if any).

2.5 All Staff and Subcontractors

All staff and subcontractors are responsible for ensuring they comply with the EMP, their General Environmental Duty (GED) and Duty to Notify in accordance with the *Environmental Protection Act 1994* (EP Act) as detailed below.

2.5.1 General Environmental Duty

Section 319 of the EP Act states that every person has a GED. This GED requires that a person must not carry out an activity that causes, or is likely to cause environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm. In deciding measures to be undertaken to fulfil the GED the following must be considered:

- The nature of the harm or potential harm
- The sensitivity of the receiving environment
- The current state of technical knowledge for the activity
- The likelihood of successful application of the different measures that might be taken
- The financial implications of the different measures as they would relate to the type of activity.

Compliance with the GED may be a defence to offences related to causing unlawful environmental harm. If defendants can show that the harm happened while a lawful activity apart from the EP Act was being carried out and they fulfilled their GED, then they cannot be found guilty of causing unlawful environmental harm.

2.5.2 Duty to Notify

Section 320 of the EP Act requires that on becoming aware of serious or material environmental harm being caused by an activity that they are involved in, a person has a duty to report that harm, unless the harm is authorised by the Administering Authority (i.e. is undertaken in accordance with an approval or condition of a permit/licence). This is the duty to notify environmental harm. For the Daintree Microgrid Project the Administering Authority is the Douglas Shire Council, and the Wet Tropics Management Authority. Failure to fulfil this duty is an offence and can lead to prosecution.

2.6 Key Contact Information

The Project Construction Manager is to maintain a contact register for the key organisations/personnel involved in the project, emergency contact details and key environmental contacts. Environmental contacts should include (but not be limited to):

- Douglas Shire Council: (07) 4099 9444

- Volt Advisory (07) 3667 8877
- Wet Tropics Management Authority: (07) 4241 0500
- Department of Environmental and Science (DES) pollution hotline: 1300 130 372
- Queensland National Parks and Wildlife (Mossman): (07) 4098 2188
- Jabalbina Yalanji Aboriginal Corporation (representing Eastern Kuku Yalanji): (07) 4098 3552
- Daintree Wildlife Rescue: (07) 40980 7284 (for reporting injured or orphaned wildlife).

3. Environment Management Plan Implementation

3.1 Environmental Obligations

VA and the PCM will implement and foster environmentally responsible management of their activities and will comply with all relevant regulatory requirements, policies and permit approval conditions. The appointed PCM will be responsible for ensuring all subcontractors and employees similarly comply with all aspects of their environmental management obligations. An Environmental Policy is to be developed for the Daintree Microgrid Project on the following basis.

3.1.1 Environmental Policy

The purpose of the environmental policy is to provide a framework for:

- Complying with all relevant legislation, regulations and policies.
- Improving environmental performance.
- Meet and strive to exceed the minimal acceptable requirements of the EP Act in its management of activities in relation to the environment.
- Requires all those who access project work areas for construction or auditing purposes to meet the minimal requirements in the treatment of the environment within and about the works site.
- Implements and maintains environmental review procedures.
- Establishes a framework where all activities, current and proposed can be assessed against minimum environmental requirements, ensuring that those requirements are met on a consistent and sustained basis.

VA (and the PCM) will ensure that all employees, operators and lessees are aware of the policy and the commitment to the environment.

3.1.2 Environmental Objectives

Environmental objectives of this project are to:

- Ensure that all activities comply with this EMP.
- Minimise impacts from the on-site activities to receiving environments.
- Provide an appropriate level of environmental management for their own activities and all subcontractor activities.
- Raise staff awareness of the importance of implementation of this EMP.

VA and the PCM Policies (when available) are set out in Appendix D to this EMP.

3.2 EMP Requirements

3.2.1 Training, Awareness and Competence

All personnel involved in construction works will be required to be formally briefed before commencing any work at the site. The induction is to specifically emphasis conditions on regulatory approvals and permits that are applicable to their area of works. The environmental component of the brief shall include (but not be limited to) the following items:

- All staff to be made aware of their General Environmental Duty and Duty to Notify responsibilities as per the *Environmental Protection Act 1994* and the implications of failing to fulfil these duties.
- All staff are to be made aware of the conditions of approvals from regulatory agencies in respect to undertaking their works, and the conduct of project construction generally.
- All staff to be made aware of their environmental responsibilities under this EMP in relation to implementing mitigation measures, reporting environmental incidents and complaints and implementing corrective actions.
- All staff to be given instructions on environmental emergency response procedures (i.e. spill kit locations and usage).
- All tasks are to be reviewed with consideration given to changes to construction works, such as the weather, which may cause the proposed activities to impact on the environment.
- All staff to be aware of protocols of interactions with wildlife and particularly snakes and cassowaries that may be present on the site.
- All staff to be aware of, and have been given specific instruction with respect to traffic management and the Traffic Management Plan (TMP).

3.2.2 Records

All records shall be retained as a hard copy and electronically by VA. It should be noted that records may be audited at any time, and any/all records be made available as requested by regulatory agencies. The records should include the following:

- Briefing notes, inductions, and any specific environmental training records.
- All records pertaining to any conditions under the EPBC and approval from WTMA, including this EMP, and any conditions with QPWS/DES, DR and any other regulatory agency conditions on approvals.
- All records pertaining to agreements and conditions reached with Douglas Shire Council, including conditions on development and operational works approvals.
- Monitoring records and external environmental reports, which can be audited and/or requested by regulatory agencies at any time.
- Environmental incidents, complaints and non-conformances, and corrective action reports.
- Records shall also be made available to VA as requested. All records shall be kept for a minimum of five years or as required by relevant third-party approval conditions.

3.2.3 Incident Reporting

All environmental incidents from site activities must be reported to VA in the first instance, unless the instance constitutes a notifiable incident under the *Environment Protection Act 1994* (e.g. major hydrocarbon spill) in which case the DES Pollution Hotline on 1300 130 372 is to be contacted the same time as reported to VA. Examples of environmental incidents to be reported to VA include the following:

- Fuel, oil and/or hydraulic oil leakages/spills (minor only and non-notifiable)
- Fire and/or explosions.
- Unearthing/disturbance of historical or indigenous cultural heritage.
- Significant erosion and sediment control failure.

- Vegetation clearing/fauna interactions (including but not limited to: snakes, crocodiles, cassowaries).

The PCM shall be responsible for investigating environmental incidents and maintaining records of actions taken. Where applicable, environmental incidents shall be reported to VA and the WTMA (and/or DES) by the Contractor or in accordance with relevant contractual obligations.

3.2.4 Complaints

Complaints represent an opportunity for improvement or enhancement of project environmental performance. All project complaints, including those from members of the public, stakeholder groups and regulatory authorities, shall be recorded by the PCM and notification provided to VA. VA shall be responsible for investigating and responding to complaints in a timely manner.

3.2.5 Non-conformance and Preventative/Corrective Actions

Non-conformances managed by this EMP shall include (but not be limited to) the following:

- An incident or near miss with potential or actual environmental impact.
- Complaints regarding project construction works.
- Not meeting an objective or target.
- Management review not being undertaken.

The PCM shall be responsible for identifying and implementing any preventative and/or corrective actions in response to any non-conformance. Preventative and correction actions shall be incorporated into the Construction EMP as required.

3.2.6 Non-conformance and Preventative / Corrective Actions

Non-conformances managed by this EMP shall include (but not be limited to) the following:

- An incidence or near miss with potential or actual environmental impact.
- Complaints regarding project construction works.
- No meeting an objective or target identified in this EMP.
- Non-compliance with any regulatory conditions of permits/approvals.
- Management reviews not being undertaken.
- The PCM shall be responsible for identifying and implementing any preventative and/or corrective actions in response to any non-conformance.
- Preventive and corrective actions shall be incorporated into the construction EMP as required to address non-conformances.

3.2.7 Audit and inspections

Aspects with a potential for environmental impact shall be subject to environmental inspections and audits as required (risk-based approach) and in accordance with internal approved procedures. Internal project audits shall be conducted by VA (or qualified delegate). Audit objectives shall be to verify compliance with the EMP and applicable permits, approvals and regulations.

It should be noted that external audits may be conducted by regulatory agencies at any time, or in accordance with final conditions on relevant approvals.

3.2.8 Reporting

Reporting by the PCM shall be undertaken in accordance with applicable approval/authority conditions or as requested by VA and regulatory agencies as conditions on approvals. Reporting shall include all relevant information pertaining to environmental matters (e.g. records, monitoring results, incidents,

complaints, audits and inspections, etc.) as required under the approval/authority. PCM shall be ultimately responsible for reporting with support from suitably experienced and qualified staff as required.

PCM shall report on environmental performance to VA (as required) in any meetings or documented progress reports in accordance with contractual obligations.

3.3 Legislative Requirements

3.3.1 General

The purpose of environmental approval legislation is to define acceptable environmental performance standards and criteria. Licences and approvals are legally binding agreements between the administering authorities and the holder, which outlines the holder's commitment to protect the environment. Licence, permit and development approval conditions address the issues most likely to cause or risk environmental harm.

Volt Advisory is the regulatory applicant and the owner of the infrastructure under construction, and is ultimately responsible for meeting the obligations for implementing the requirements of various permits and approvals. Obligations of the PCM rests in accordance with contractual requirements with VA and General Environmental Duty responsibilities under the EP Act. A summary of the regulatory requirements that are to be addressed as part of this project are presented in the following. Note that final conditions on some of the approvals are not yet available. When issued, any conditions that are additions to, or are variations to the elements in this EMP will be incorporated and approved by VA (as permit holders) prior to commencement of construction.

Table 1 Summary of Applicable Legislation

Legislation	Responsible Authority	Activity	License / Permit / Approval
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of Climate Change, Energy, the Environment and Water	Construction with potential for impact on Matters of National Environmental Significance.	Not Applicable A referral for the Daintree Microgrid Project (2022/ 09341) has been made to the Commonwealth under this Act. The project has been deemed to be "Not a Controlled Action" under the Act and no conditions have been imposed.
<i>Nature Conservation Act 1992</i>	Department of Environment and Science	Vegetation disturbance in a high risk protected flora survey trigger area	Not required Almost the entirety of vegetation within the Project Area road reserve is mapped as habitat for protected flora. Clearing of ANY native vegetation within the road reserve will trigger this Act and require a Protected Flora clearing application. The proposed design does not required the disturbance of any native vegetation and subsequently the protected flora framework is not applicable to this project.
<i>Nature Conservation Act 1992</i>	DES	Interference with fauna breeding areas for listed species	Not required. Surveys along the road reserves and within the solar farm site have determined that no breeding areas for listed species are within or immediately

Legislation	Responsible Authority	Activity	License / Permit / Approval
			adjacent the project disturbance footprint. The proposed design does not required the disturbance of any habitat areas and subsequently this aspect is not applicable to this project.
<i>Wet Tropics Management Plan</i>	Wet Tropics Management Authority	Construction and operation of infrastructure within the WTWHA	Not required A permit has been granted by the WTMA under s.45 of the Wet Tropics Plan 1998 for installation of electrical distribution network within Zone C of the Wet Tropics World Heritage Area.
<i>Planning Act 20106</i>	Department of State Development, Infrastructure, Local Government and Planning	Development Application for the entirety of the project required to the State Assessment Referral Agent.	Applicable: Controls overarching development approval for the solar farm under Qld legislation. Prelodgment meetings and responses from agencies have identified that there are no state interest triggers for the generation site. Approval for the solar farm (material change of use and reconfiguration of a lot) will be directly to Douglas Shire Council, project operational works and CMD assessment are also devolved to DSC.
<i>Fisheries Act 1994</i>	Department of Agriculture and Fisheries	Removal of protected marine plants	Not applicable Protected marine plants are present in the road reserve outside the disturbance footprint alignment. Any variation from the current proposed alignments may trigger requirement for approval to remove marine plants. DAF have identified that under the current design there are no state assessment codes triggered.
<i>Fisheries Act 1994</i>	Department of Agriculture and Fisheries	Use of waterway barriers in a regulated high impact waterway	Not applicable Waterway barriers will not be required for the project. Pre-lodgement advice from DAF has indicated that provided the works are undertaken in the manner described, waterway barrier permits are not required.
<i>Aboriginal Cultural Heritage Act 2003</i>	Department of Aboriginal and Torres Strait Islander Partnerships	Require those conducting disturbance activities in areas of significance to take all reasonable and practical measures to avoid harming cultural heritage.	Applicable Aboriginal cultural heritage values are present in the project footprint and the project area is covered by an Indigenous Land Use Agreement c). In order to meet Duty of Care Guidelines an accidental discovery procedure (minimum) is required. VA have engaged with Jabalbina and have a procedure which is to be followed.

Legislation	Responsible Authority	Activity	License / Permit / Approval
<i>Biosecurity Act 2014</i>	Department of Agriculture and Fisheries (DAF)	Working in a mapped biosecurity zone.	Applicable (compliance) The general biosecurity obligation (GBO) requires everyone to manage biosecurity risks and threats under their control. Invasive species elements is included in this EMP.
<i>Environmental Protection Act 1994</i>	Department of Environment and Science	Where 'serious and material environmental harm' is caused or threatened.	Applicable (compliance) No approvals triggered. General Environmental Duty and Duty to Notify.
<i>Vegetation Management Act 1999</i>	Department of Resources	Clearing of regulated vegetation	Not applicable Pre-lodgement advice from SARA has indicated that provided the works are undertaken in the manner described, permits for clearing of regulated vegetation are not required.

3.3.2 Codes of Practice

Codes of practice are formalised agreements between the WTMA and other government agencies for managing infrastructure or other aspects of the WTWHA. Those Codes of Practice applicable to this project are presented in Guideline 9a: "Roads in Rainforest - Best Practice Guidelines for Planning, Design and Management¹" are to be incorporated into construction aspects.

These Codes of Practice are relevant to the construction and maintenance of the cable distribution network within the entirety of the road reserve network, and are not confined to the WTWHA.

¹ <https://www.wettropics.gov.au/section-62-guidelines>

4. Environmental Elements

4.1 Identification of Relevant Environmental Elements

The Queensland Government Guideline - *Preparing Environmental Management Plans* outlines likely environmental elements that should be addressed in an EMP. Relevant environmental elements to the Daintree Microgrid Project as identified in the QLD Guideline are summarised in the following.

Table 2 Environmental Element Assessment

Issue	Applicable	Notes	EMP Element
Air quality	✓	Exhaust fumes, noise and dust may be encountered at any construction site.	Air Quality
Cultural heritage	✓	Jabalbina Aboriginal Corporation have prepared a Cultural Heritage Clearance and Assessment Report for this project.	Cultural Heritage
Complaint recording and reporting	✓	Essential requirement for project management.	All CEMP elements
Dust	✓	Minor earthworks are required for the construction of the solar farm.	Air Quality
Emergency response	✓	Essential requirement for project management.	Emergency Response
Erosion and sedimentation	✓	To be implemented across all construction elements.	Erosion and Sediment Control
Flora and fauna	✓	Diverse range of environment adjacent works area, much of which is considered to be essential habitat for a range of rare, threatened or otherwise conservation significant fauna / flora.	Flora and Fauna
Fire management	✓	Limited in scope owing to low risk.	Emergency Response
Land contamination	✓	Low risk, primarily restricted to machinery malfunction/ accidents.	Contaminated Land, Fuel and Hazardous Substances
Management of Natural and World Heritage values	✓	Encompasses a range of aspects relevant to the Wet Tropics World Heritage Area. Highest priority for management.	Natural and World Heritage Values
Noise	✓	Noise from the solar farm generation site is a consideration for adjacent landowners.	Noise and Vibration
Rehabilitation	X	Limited in scope owing to minimal earth disturbance and no vegetation clearing.	Flora and Fauna

Issue	Applicable	Notes	EMP Element
Social disruption	✓	See below. Traffic disruption during cable laying activities is expected.	Noise and Vibration Air Quality
Traffic (construction)	✓	As above. Traffic disruption during cable laying activities is expected.	Noise and Vibration Air Quality Flora and Fauna
Vibration	X	Not anticipated as major earthworks and large earthmoving equipment, e.g. dozers and scrapers, are required.	Noise and Vibration
Visual amenity	✓	Limited in scope owing to underground nature of cable installation. Construction impact at solar farm site (off Silkwood Road) and of solar arrays for residents along Silkwood Road during operations.	All CEMP elements
Waste and site clean-up	✓	Applicable to all elements of project management.	Waste
Water quality	✓	Limited in scope as waterways require waterway barrier works or riparian / bed /bank disturbance. Highest risk machinery malfunction and erosion during trenching.	Erosion and Sediment Control/Water Quality Management
Weed and pest management	✓	All traffic movement and construction activities generally have provisions to provided vectors for pest distribution.	Biosecurity Management

This EMP does not specifically address traffic management for site specific activities as VA, the PCM and individual contractors (e.g. cable laying and HDD contractors) will be responsible for developing and implementing a traffic management plan during construction independent of this EMP. This traffic management plan will be developed in consultation with Douglas Shire Council.

Notwithstanding, this EMP identifies a number of general measures related to traffic and machinery movement and activities that are to be incorporated into the traffic management plan.

4.2 Natural and World Heritage Values

4.2.1 Aspect

The Daintree Microgrid Project area comprises a diverse set of natural ecosystems with a variety of existing uses and tenures. It has been formerly assessed according to its outstanding universal values or world heritage values. This incorporates wet tropics rainforests and ancient ancestry with many unique plants and animals, scenic natural beauty, community benefits and rainforest aboriginal country.

Sections of the DMG project area have been accepted under the World Heritage Convention as of World Heritage Status. The Wet Tropics World Heritage Area (WTWHA) was inscribed on the World Heritage List in 1988.

It is to be noted that the freehold land excluded from the WTWHA, similarly includes outstanding natural and world heritage values, and no distinction is made in this EMP between the WTWHA and freehold land with respect to the implementation of this EMP. Natural and world heritage values may

include (but not be exclusive of) cultural chance finds, iconic flora/fauna, heritage places, Threatened Ecological Communities (Commonwealth Listed under EPBC Act), scenic amenity/values, and adverse disturbance within the WTWHA.

This environmental element also links to Flora and Fauna and Biosecurity Management. Natural and Heritage values in the context of this element refers to:

- Integrity of the natural environment and habitat values of the DMG project area.
- Maintenance of water quality of traversed watercourses and subsequent downstream integrity of the Great Barrier Reef Coast Marine Park.
- Amenity of the story places of the Eastern Kuku Yalanji within the project area.
- Protected and iconic flora and fauna and habitats of the general DMG project area between Cow Bay and Cape Tribulation.

4.2.2 Management Plan

Environmental Objective		
To minimise the potential for impacts to the general natural and World Heritage Values of the landscape within the DMG Project Area, including private land, the WTWHA, Daintree National Park and Great Barrier Reef Coast Marine Park.		
Performance Criteria		
<ul style="list-style-type: none"> • All works to comply with conditions of development approval for operational works from DSC under the DSC Planning Scheme (2018), <i>Planning Act 2016</i>, and <i>Local Government Act 2009</i>. • All works managed in accordance with the <i>Wet Tropics World Heritage Protection and Management Act 1993</i> and the <i>Wet Tropics Management Plan 1998 Plan</i>. • All works managed in accordance with the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> • All works to comply with conditions of agreements / approvals from any other regulatory authority. • All works to comply with conditions of the WTMA permit. • No complaints are received from regulatory authorities or the community in relation to the site management of WTWHA heritage items/places/values. • No unauthorised disturbance to and/or removal or destruction to heritage items/places/values within the DMG project area 		
Mitigation Measures	Responsibility	Timing
All personnel must exercise a duty of care, that is, they must take all reasonable and practical measures to ensure their activity does not harm heritage items/ places/ values.	All personnel	At all times
If at any time during the activity it is necessary to excavate, relocate, remove or harm a heritage find, the activity should cease immediately and the Site Supervisor and Project Manager notified.	All personnel	Immediately on discovery
Upon discovery of a heritage find the WTMA and VA shall be contacted and their advice and agreement sought as to how best to manage the find, to avoid or minimise harm to WTWHA heritage find.	Project Manager	Immediately after notification
Any heritage finds are to be managed in accordance with any agreement reached with the DSC/WTMA/DES delegate or member and their advice sought as to how best to manage the find to avoid or minimise harm to the heritage find. Any agreement reached with DSC/WTMA/DES and VA shall be recorded and documented.	Project Manager	As required

Monitoring	Responsibility	Timing
Any discovery of heritage, will be recorded on an Environment Incident Report Form.	Site Supervisor	Upon identification
Monitor excavations for potential signs of heritage.	Site Supervisor	During HDD / trenching and general construction
Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Project Manager	Following identification
Inform DSC/WTMA as soon as practically possible in the event of any heritage find or management issue.	Project Manager	Following incident
Corrective Action	Responsibility	Timing
All complaints relating to management of heritage issues will be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint
Where investigations identify issues with heritage management actions, revision to management plans will be undertaken and further controls implemented, as necessary.	Project Manager	Following investigation
Corrective action will be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

4.3 Eastern Kuku Yalanji Cultural Heritage

4.3.1 Aspect

Jabalbina Aboriginal Corporation, representing the Traditional Owners (Eastern Kuku Yalanji) of the project area are key supporters in the Daintree Microgrid Project (<https://voltadvisorygroup.com/#who-we-work>). A project support letter is included as Appendix A.

Jabalbina have undertaken a Cultural Heritage Clearance and Assessment Report independent of this EMP, to support the preparation of a Cultural Heritage Management Plan (CHMP). The Traditional Owners who speak for Country relevant to the Project Area were engaged during the Cultural Heritage Clearance and Assessment Report.

This CHMP will have regulatory authority under the provisions of the Qld *Aboriginal Cultural Heritage Act 2003*. VA and all contractors will be required to follow this CHMP as part of their EMP obligations.

The Daintree National Park is subject to an Indigenous Land Use Agreement (ILUA QI2006/026) between the Commonwealth/State and Eastern Kuku Yalanji, and comes under the provisions of the Daintree National Park Management Plan (April 2019), and the Eastern Kuku Yalanji Indigenous Protected Area Management Plan (2012). All works adjacent to the Daintree National Park must have due consideration of, and comply with, the management objectives and outcomes of these management plans.

The Cultural Heritage Clearance and Assessment Report has identified that there are limited cultural heritage aspects, designated landscape areas or registered cultural heritage study areas/ sites in the immediate construction locality of the road reserves, except for the Daintree National Park itself.

4.3.2 Management Plan

Environmental Objective		
To minimise impacts to cultural heritage values, places or items.		
Performance Criteria		
<ul style="list-style-type: none"> All works managed in accordance with the <i>Aboriginal Cultural Heritage Act 2002</i> and the <i>Aboriginal and Cultural Heritage Duty of Care Guidelines 2004</i>. All works managed in accordance with, and must comply with, the Eastern Kuku Yalanji Cultural Heritage Management Plan for the microgrid project. Works will not compromise the management objectives of the Daintree National Park Management Plan or the Eastern Kuku Yalanji IPA Management Plan No complaints are received from regulatory authorities or the community in relation to the handling of cultural heritage items/places/values. No unauthorised disturbance to and/or removal or destruction to cultural heritage items/places/values within the WTWHA. 		
Mitigation Measures	Responsibility	Timing
Implementation of all measures as identified in the Eastern Kuku Yalanji Cultural Heritage Management Plan	VA Project Manager	Prior to construction
All personnel must exercise a duty of care, that is, they must take all reasonable and practical measures to ensure their activity does not harm Cultural Heritage items/ places/ values.	All personnel	At all times
If at any time during the activity it is necessary to excavate, relocate, remove or harm a Cultural Heritage find, the activity should cease immediately and the Site Supervisor and VA notified.	All personnel	Immediately on discovery
All earthworks are to stop immediately on observance of cultural heritage elements, either by Eastern Kuku Yalanji observers, or by site workers. The affected area is to be immediately flagged, and no further disturbance undertaken until significance of the find has been assessed and a management approach agreed with the relevant party	Site supervisors VA	Immediately on discovery
No vegetation clearing (greenfield clearing) is required for the project and vegetation clearing has been expressly identified as a project non-conformance. If, at any time, native vegetation is removed, the impact area is to be immediately flagged, and no further disturbance undertaken until significance of the find has been assessed and a management approach agreed with the relevant party	Site supervisors VA	Immediately on identification.
Upon discovery of a Cultural Heritage find, the representative for Jabalbina for the area shall be contacted in accordance with the provisions of the Eastern Kuku Yalanji Management Plan and their advice and agreement sought as to how best to manage the find to avoid or minimise harm to the Aboriginal Cultural Heritage.	VA Site Supervisor	Immediately after notification
Any Cultural Heritage finds are to be managed in accordance with any agreement reached with the Eastern Kuku Yalanji through their Cultural Heritage Management Plan) Any agreement reached with the Aboriginal Party for the area (Eastern Kuku Yalanji) shall be recorded and documented.	VA Site Supervisor	As required
Monitoring	Responsibility	Timing
Any discovery of Aboriginal Cultural Heritage, will be recorded on an Environment Incident Report Form.	Project Manager Site Supervisor	Upon identification

Monitor excavations for potential signs of Aboriginal Cultural Heritage.	Site Supervisor	During excavation
Reporting	Responsibility	Timing
All personnel to report incidents to Site Supervisor.	All personnel	At all times
Site Supervisor to notify Project Manager (PCM) and VA immediately in the event of any Cultural Heritage find or management issue.	Site Supervisor	Following incident
VA to notify the relevant Eastern Kuku Yalanji representative immediately in the event of any Cultural Heritage find or management issue.	VA	Following incident
Inform the DATSIP as soon as is practically possible in the event of any Cultural Heritage find or management issue.	VA	Following incident
Record and manage all complaints in a register and corrective actions taken.	VA	Following identification
Corrective Action	Responsibility	Timing
All complaints relating to Cultural Heritage management issues will be investigated promptly and appropriate actions taken.	VA/Project Management	Upon receipt of complaint
Where investigations identify issues with Cultural Heritage management actions, revision to management plans will be undertaken and further controls implemented, as necessary.	VA/Project Management	Following investigation
Corrective action will be implemented to meet required outcomes of Administering Authorities.	VA/Project Management	Where required

4.4 Erosion and Sediment Control

4.4.1 Aspect and Impacts

Soils across the DMG project area vary widely according to geology, resultant soil type, vegetation type, drainage and topography. None of the soil types are considered to be dispersive (i.e. of a sodic nature), albeit all types are vulnerable to off site transport following periods of heavy rain.

Erosion and sediment control as per the International Erosion Control Association (IECA) Best Practice Erosion & Sediment Control Guidelines and the FNQ Regional Organisation of Councils (FNQROC) Development Manual v.8 will apply to the traditional earthworks component of the solar farm construction site. Construction aspects related to this project component are not unique, with industry standard ESCP provisions to be implemented based on the final layout and design of the solar farm structures.

The majority of soils to be disturbed (trenching or HDD) belong to the existing formed road base of the current road network, and primarily consist of imported road base fill which is not derived either in-situ or from local sources (e.g. local borrow pits). The road base material may be considered reusable, and any spoil from HDD operations will be stockpiled at the solar farm site, or in accordance with directions from Douglas Shire Council as trustee of the road reserve, and owner of the road infrastructure (including road base material).

The specialised construction nature of the project with site specific machinery (trenching tractors/cable plows and horizontal directional drilling equipment) require equally specific erosion and sediment control considerations.

Cable plow/trenching works will be undertaken with a mobile trenching tractor (typically a Vermeer GTX750 or equivalent), with an average disturbance (trench) footprint of between 150mm to 300mm width. Trenching works are undertaken at a very slow pace, typically less than 3 km/hr, and under most conditions, much less. Trenches are only open for the period of time it takes to lay the cable, which in most instances will occur following the cable plow/trenching operation, and then immediately covered over. Given the moving nature of the trenching plow, permanent installation of erosion and sediment control measures are not applicable. However the following general precepts will apply:

- Near vulnerable habitats (e.g. wetlands, tidal areas and watercourses), sediment control measures in the form of sediment fencing along the downslope length of the identified vulnerable habitats to be installed prior to trenching operations occurring.
- On any slope where there is potential for overland flow to impact on the earthworks then cross check flow rock or sediment fencing interception is required on the outward side of the trench works.
- All diversionary fencing/cross check rock/fencing to ensure that diversion is to existing formed roadside drains and does not discharge to natural habitat.
- All HDD start up and operational drilling pits are to be bunded to ensure that drilling fluids, sediments, drill muds and potential hazardous materials (fuels/oils) are contained within the bund in the event of an unexpected.
- All HDD start up pits are located >50m from the nearest perennial waterway – this includes (but not exclusive of) Hutchinson, Cooper, Noah, Oliver, Mason, Myall Creeks.
- Similarly, the terminus of all trenches on the approach and department of watercourses are to have ESCP measures installed appropriate to each location.

ESCP implementation and effectiveness may be audited and inspected without need for notification by regulatory agencies during the course of construction, in accordance with conditions on approvals/permits. In addition to the

Any and all ESCP measures will be on public display and open to public scrutiny. Visual amenity is a key WTWHA value and the WTMA will routinely undertake inspections to ensure that WTWHA values are not compromised.

4.4.2 Management Plan

Environmental Objective
<p>Minimise potential for general off-site impacts of sediment transport from cable laying and solar farm construction activities through implementing erosion control measures appropriate to the scale and intensity of works, sensitivity of receiving environment and conditions of permits/approvals.</p> <p>Minimise potential for sediment to adversely impact on aquatic and wetland environments that may result in transport of sediments downstream to the Great Barrier Reef Coastal Marine Park .</p> <p>Minimise potential for sediment to migrate off site from earthworks areas into adjoining sensitive habitats for fauna and flora.</p>
Performance Criteria
<ul style="list-style-type: none"> • All works are managed in accordance with the International Erosion Control Association <i>Best Practice Erosion & Sediment Control Guidelines</i>, FNQROC Development Manual (v.8) Design Manual s.D5 “<i>Stormwater Quality Management</i>”, the <i>Environmental Protection (Water) Policy 2019</i> and any other relevant approval and statutory requirement as per conditions on permits and approvals. • Reference is made to the “Road Maintenance Code of Practice for the Wet Tropics World Heritage Area (2017)” as a guideline for the selection, establishment and maintenance of erosion and sediment control structures within the road reserve network. • No complaints or adverse audit findings are made in relation to the ESCP measures employed. • No complaints are received from regulatory authorities or the community in relation to erosion and sediment control issues.

Mitigation Measures	Responsibility	Timing
Erosion and sediment control methods shall be implemented in accordance with the International Erosion Control Association's "Best Practice Erosion and Sediment Control Guidelines" prior to commencing earthworks onsite, and then maintained for duration of construction or until site is stabilised to satisfaction of auditing/monitoring requirements. .	PCM	As required during construction
All contractors are to provide individual ESCP particular to the type of operations they are undertaking, the localities, and the nature of machinery/earthworks involved.	PCM Contractors	Before commencing earthworks
Specific requirements for the preparation of ESCS and ESCP as per FNQROC Development Manual (v.8) Design Manual s.D5 " <i>Stormwater Quality Management</i> ", to be submitted for approval to DSC prior to construction of works.	PCM	Before commencing construction.
Specific requirements of the <i>Wet Tropics Plan 1989</i> and the "Code of Practice for Maintenance of Roads in the Wet Tropics World Heritage Area" as relevant to all aspects of construction within the road reserve	PCM Contractors	As required during construction
A general project site and works specific Erosion and Sediment Control Plan (ESCP) shall be developed prior to disturbance works (e.g. cable trenching) occurring. The ESCP shall address (at a minimum): <ul style="list-style-type: none"> - Identification of sensitive receiving habitats including wetlands, watercourses and . - Any areas off the sealed road areas utilised for machinery or vehicle movement and access during construction - The disturbance footprint to be clearly identified on all plans, and all areas of vegetation demarcated to avoid disturbance. - Incorporate the machinery and operational specific ESCP to be developed and submitted by the contractors for trenching/HDD operations 	VA PCM	Before commencing earthworks
Sufficient materials shall be available to enable implementation of erosion and sediment controls as required.	PCM	Before commencing earthworks
Work shall be scheduled to ensure that temporary erosion control works are in place by the end of work each day, especially before weekends, if rain is imminent, or when permanent erosion control works are not in place or feasible.	PCM	Throughout construction
In the event of extreme weather conditions (e.g. storm events) construction work will cease and the need for additional erosion and sediment control shall be assessed and implemented where required.	PCM	Throughout construction
Soil and surface stability shall be maintained at all times.	PCM	Throughout construction
Stockpiles of surfacing material or removed soil, are not to be established outside of the solar farm site. No stockpiling to occur within the road reserve project area.	PCM Contractors	Throughout construction
The entirety of the riparian vegetation of Buchanan Creek on the western boundary of the solar farm lease area is to be demarcated, and erosion and sediment control measures to be installed along the boundary to prevent any unexpected sediment generation and transport of offsite sediment.	PCM Contractors	Before commencing earthworks
All stockpiles within the solar farm site must be covered and bunded when not in use.	PCM Contractors	Throughout construction
Recovered spoil material from operations considered to be reusable road base and property of DSC is to be relocated to locations nominated by DSC under agreements of tenure authority relevant to disturbance of DSC road assets.	PCM VA	Throughout construction
No trenches are to remain open overnight. All trenches are to infilled as quickly as practical following cable laying and secured such that no fauna can access the cable trench. Only as much length of cable trench as can be laid in a working day shall be exposed at any time.	PCM	Throughout construction

Keep vehicles to defined access route, in accordance with traffic management plan as approved by DSC. These are to include the Cape Tribulation Road, and any formed road to the cable work areas.	PCM	Throughout construction
Native vegetation is not to be cleared for any aspect of the project. All vegetation to be retained will be demarcated by appropriate marking (survey tape/markings paint on ground) and avoided in all construction activities.	PCM	Throughout construction
Near vulnerable habitats (e.g. wetlands, tidal areas and watercourses), sediment control measures in the form of sediment fencing along the downslope length of the identified vulnerable habitats to be installed prior to trenching operations occurring.	PCM Contractors	Throughout construction
On any slope where there is potential for overland flow to impact on the earthworks then cross check flow rock or sediment fencing interception is required on the outward side of the trench works.	PCM Contractors	Throughout construction
<u>All diversionary fencing/cross check rock/fencing to ensure that diversion will be to existing formed roadside drains, and does not discharge to natural habitat.</u>	<u>PCM</u> <u>Contractors</u>	<u>Throughout construction</u>
<u>All HDD start up and operational drilling pits are to be bunded to ensure that drilling fluids, sediments, drill muds and potential hazardous materials (fuels/oils) are contained within the bund in the event of an unexpected.</u>	<u>PCM</u> <u>Contractors</u>	<u>Throughout construction</u>
Monitoring	Responsibility	Timing
Undertake routine visual inspections to ensure erosion and sediment control measures are implemented where required.	Site Supervisor	Daily
Undertake ongoing monitoring of weather conditions (including extreme weather) and alerts relevant to the construction area.	Site Supervisor	Daily
Undertake inspections of the effectiveness of erosion and sediment control measures after significant rainfall events.	Site Supervisor	Where necessary
Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	PCM VA	Throughout construction
Inform firstly VA, and then the Administering Authority in a timely manner i.e. as soon as practical, in the event of a significant erosion and sediment control issue. A significant issue is one which in which: a) water courses exhibit visual turbidity : as a result of obvious point source failure in the ESCP measures, b) sediment migration outside of ESCP controls into adjoining habitats	PCM/Site Supervisor	Following identification
Corrective Action	Responsibility	Timing
Appropriate control measures shall be implemented in a timely manner where sedimentation or erosion issues are identified or have the potential to occur in the future.	PCM	Following identification
Restore sediment areas as soon as is practical following event and repair/install sediment control mechanism. (e.g. rock aggregate, geo-textile).	PCM	Following identification
All complaints in relation to erosion and sediment control shall be investigated, and as required, legitimate problems shall be rectified.	PCM	Upon receipt of complaint
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	PCM VA	Where required

4.5 Visual Amenity

4.5.1 Aspect

Visual amenity is an important aspect of the Daintree experience, whether for residents and local community, or visitors to the region. A number of aspects of the Daintree Microgrid Project have the potential to impact on visual amenity. These are broadly divided into two categories;

- Far-field viewshed visual impacts
- Near-field viewshed visual impacts

Far-field viewshed visual impacts are those that are experienced at distance from project elements. In this project instance, this considers:

- The solar farm and array to be visible from key World Heritage Area vantage points, or from other landscape scale viewsheds in the area.
- Glint and glare from the solar farm arrays potentially visible from vantage points.

Near-field viewshed visual impacts are those that are sustained in proximity to project elements. For this project, near-field visual impact elements include:

- Construction aspects – machinery traffic, open trenching and HDD operations.
- Operational aspects – solar farm arrays and supporting infrastructure, transformers and network kiosks along the cable distribution network.

Both a far-field and near-field assessment of the visual amenity of the Daintree Microgrid Project has been undertaken. The salient elements relevant to project management are set out below:

Far-field viewshed aspects:

The solar farm is invisible from any vantage point along the nearest WTWHA area viewshed, being the Cape Tribulation Road over the Alexandra Range. At its closest point the Cape Tribulation Road through the Daintree National park is greater than 1km from the solar farm, and completely obscured by forest. The Walu Wugirriga lookout at the top of the range faces south-east over the Daintree River. The northern viewshed from the lookout is obscured by mature rainforest with no physical view possible north. Subsequently potential glint and glare from the mirrored solar panels will not be discernible from any vantage point from the WTWHA.

With respect to residential locations within a 5km proximity, the highest residential areas are located at the top of White Beech and Red Gum Road (Cow Bay) approximately 2.8km from the solar farm, and Mahogany Road (Diwan) approximately 5km from the solar farm. The solar array (maximum of 2.6m height, and single storey containerised supporting infrastructure is not visible from any of these locations and subsequently also will not be subject to glint and glare from the solar arrays.

Near-field viewshed aspects:

Near field aspects will be encountered during construction of the cable distribution network and solar farm and of the solar farm and transformers and kiosks operationally.

During construction the key aspects will be the movement of machinery, the earthworks associated with trenching and HDD operations, and general visual amenity related to construction works such as waste.

Operationally, the solar farm itself will not be visible from residences on the eastern side of Silkwood Road owing to the retained vegetation on these properties, however it *will* be visible to traffic accessing these properties on Silkwood Road. This near-field viewshed, in the absence of any mitigation measures, will reduce the Daintree experience for visitors to commercial premises (B & B accommodation) at the southern end of Silkwood Road.

The transformer kiosks along the distribution network are limited in number (27), do not require extensive earthworks, and are designed to be visually non-intrusive. This includes the use of suitable colouration, form and size, and strategic location. Jabalbina Aboriginal Corporation have been engaged to contract local traditional artists to decorate the larger transformers in manner sympathetic to the surrounding environment.

Glint and glare from the solar array will not be experienced along Silkwood Road (or in any other nearby vicinity, e.g. Buchanan Creek Road.). This is due to low height of the solar panels (highest being 2.6m), orientation to the north (landholders are all east of Silkwood Road), and panels individually set according to the topography of the site, i.e., no large grouping of panels at any one height. It also proposed to substantially 'thicken' the vegetation along the Silkwood Road reserve to further mitigate the potential for near-field viewshed impacts.

4.5.2 Management Plan

Environmental Objective		
To ensure that the DMG project elements do not adversely impact on the amenity values and resident community / visitor experience of the DMG project area.		
To reduce the risk to key natural value vantage points with respect to maintenance of visual amenity.		
Performance Criteria		
<ul style="list-style-type: none"> Daintree Microgrid solar farm is not visible from any far field viewsheds. All HDD/trenching operations are conducted in a manner that minimises earth disturbance with disturbance areas reinstated as soon as is practical after cable installation operations. Near field viewsheds are not compromised by the location, colour or design of ancillary distribution infrastructure. The solar array post construction will not impart any glint and glare impacts on adjoining properties, nor along Silkwood Road. All construction waste to be disposed of in accordance with the provisions of the elements in this EMP. Revegetation along Silkwood Road to shield the solar array from traffic along this road. 		
Mitigation Measures	Responsibility	Timing
Construction waste to be removed from public areas (e.g. road reserves) as soon as practical after construction.	PCM	Throughout construction
Solar panel location, design and placement to be commensurate with proposed northwards orientation to avoid any glint/glare for traffic/residents/visitors along Silkwood Road.	VA PCM	Design, construction
Road construction and operational access point to the solar farm off Silkwood Road to be restricted to the existing gazetted unnamed road reserve through the solar farm lease area.	PCM/Site Supervisor	Design Construction
Rehabilitation and stabilisation of any public areas (e.g. road reserves), to be undertaken as soon as practical post construction. VA/PCM to engage commercial revegetation resources.	PCM/Site Supervisor	At all times
Revegetation to be undertaken along Silkwood Road on the western boundary using low growing species to thicken the vegetation and improve visual amenity.	PCM/Site Supervisor	Throughout construction
All ancillary infrastructure along the cable distribution network (kiosks and transformers) are to be of a form/size and of a colour that will not detract from visual amenity of the surrounding area. This may include engagement of Traditional Owner artists.	VA PCM	Design

Monitoring	Responsibility	Timing
Revegetated areas to be monitored for weed invasion, water stress, and maintained as required.	Site Supervisor	Construction
Regular inspections of all areas of earthworks/trenching/HDD set up/draw pits to ensure that sites are rehabilitating and are not left in a soil- exposed situation.	PCM/Site Supervisor	Throughout construction
Monitor housekeeping activities to ensure waste is contained appropriately and site is clean at all times.	Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
All personnel to report incidents where waste material has been a contributing factor to visual amenity.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	PCM	Throughout construction
Record and report on all significant construction practice/activity impacting on visual amenity in public locations, e.g. road reserve.	Site Supervisor	Following identification
Corrective Action	Responsibility	Timing
All complaints relating to amenity issues shall be investigated promptly and appropriate actions taken to clean up the affected area and manage the waste generated.	PCM	Upon receipt of complaint
Where investigations show unacceptable amenity impacts revision to design/construction practices and management plans shall be undertaken and further controls implemented, as necessary.	PCM	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	PCM	Where required

4.6 Contaminated Land, Fuel and Hazardous Substances

4.6.1 Aspect

The DMG project area include habitats essential to native fauna, and encompasses waterways which provide critical habitat to endangered fish species relying on migration downstream for annual breeding. Additionally, the project area is adjacent to (but not within) the Great Barrier Reef Marine Park. Disturbance to waterways through the accidental release of oils, grease, fuels and other contaminants released during construction has been considered for the project.

In consideration of the above, there is to be NO disturbance to the riparian habitats, bed or banks of any watercourse in the road reserve, not any disturbance to any road reserve section that may potentially result in hazardous material spills affecting wetlands.

To this end, the following aspects apply to this project:

All waterways are to be either:

- Horizontally directionally drilled, with set up pits to be at least 50m from the high point of any perennial watercourse, and draw pits 20m from the edge of the defined riparian vegetation (where able to be clearly demarcated) or the high point of the bank.
- Traversed by constructing a cable/conduit structures affixed to the lawful traffic structure existing in place over that watercourse, i.e., affixing to a bridge, in accordance with agreements from DSC for utilising that infrastructure.

Wetland areas and sensitive habitats are to be avoided through the use of appropriately bunded and contained HDD set up and drawing pits established outside of the wetland boundary.

All HDD set and draw pits, and all termination locations of trench cables on approach and departure to perennial waterways are to have ESCP measures appropriate to each site incorporated.

A search of the Environmental Management Register and the Contaminated Land Register (EMR/CLR) for the solar farm generation site and the road reserves area has identified no sites included on the EMR or CLR register held by the Queensland Department of Environment and Science (DES).

4.6.2 Management Plan

Environmental Objective		
Safely manage the potential risks to natural environmental values, including adjacent habitats and downstream Great Barrier Reef Marine Park, from activities that involve the operation of machinery and accidental fuel and hazardous material spills during construction.		
Performance Criteria		
<ul style="list-style-type: none"> Fuel and hazardous substances used on site are used in accordance with AS1940 -the storage and handling of flammable and combustible liquids. No leakages of hydraulic fluids into the aquatic or terrestrial environment. No spills of fuels, oils or other hydrocarbons into the aquatic or terrestrial environment. No complaints are received from regulatory authorities or the community in relation to the spillage/leakage from the drilling operations into the environment. No disturbance to and/or disposal of hazardous waste within the WTWHA. Water quality monitoring identifies no evidence of hydrocarbons or other contaminants at any time during the construction in any part of the project area. 		
Mitigation Measures	Responsibility	Timing
Minimum quantities of hazardous substances necessary for the project shall be used on site. Bitumen/asphalt/road surfacing material used for road repair following construction only be stored at the solar farm, and transported to site as required.	PCM	Throughout construction
All storage and management of fuel and hazardous substances within the solar farm generation site will be in accordance with approved designs and the relevant Australian Standard for the volume and type of fuel/substance stored.	PCM	Throughout construction
All machinery repairs, maintenance, fuels/oils and other hazardous materials storage shall only occur within designated areas within the solar farm location during construction.	PCM VA	Throughout construction
All mobile equipment shall be refuelled and maintained at least 100m from any perennial watercourse, and only within bunded areas or other areas able to retain any accidental spillage.	PCM/Site Supervisor	As required
An appropriate spill kit, personal protective equipment and relevant operator instructions and emergency procedures for the management of wastes and chemicals associated with construction must be kept at all work sites. This includes a spill kit that is to include air boom and fuel and oil absorbent boom to be available in the event of any spillage into a perennial waterway.	VM/Site Supervisor	At all times
Records shall be kept on chemicals and dangerous goods used during construction.	PCM	Throughout construction
First aid and firefighting equipment (hand held extinguishers and fire hoses) shall be available at the construction site.	PCM	At all times
Construction workers operating vehicles on-site to be appropriately trained and licensed, so that these vehicles are operated in a safe and appropriate manner. All vehicle operators to be briefed on locations of maintenance, storage and refuelling areas.	PCM	During induction

All relevant staff shall be trained in appropriate handling, storage and containment practices for chemicals and dangerous goods to be utilised during construction.	PCM	During induction
No fuel or hazardous substances are to be stored within the road reserve at any time. All such substances are only to be stored in the designated area at the solar farm lease area. Transport and use of any of these materials shall be undertaken in accordance with relevant Australian standards (AS), guidelines and legislation, including: <ul style="list-style-type: none"> • <i>Dangerous Goods Safety Management Act 2001</i> • Regulatory requirements • Safety Data Sheets (SDS) requirements. SDS for products kept on site shall be readily available.	PCM	At all times
Ensure that the appropriate personnel undertake adequate environmental awareness training covering the requirements of this CEMP, regarding safe working procedures around hazardous materials and identification of contaminated land indicators.	PCM Site Supervisor	During induction
Monitoring	Responsibility	Timing
Visual inspections of all work sites to ensure no oil leaks, hydraulic fluid leakages or fuel leakages/spills of any other hazardous material.	Site Supervisor	Throughout construction
Visual monitoring to be undertaken of all perennial watercourses (or other waterbodies present in the work area) during trenching and HDD operations	Site Supervisor	Throughout construction
An incident register shall be maintained which includes corrective actions undertaken and persons notified.	PCM Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
Any environmental incidents involving spills shall be reported by all personnel, and recorded by Site Supervisor including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence.	All personnel Site Supervisor	Following incident
Inform the Project Manager (PCM) immediately of any incidents resulting in potential or actual environmental harm.	Site Supervisor	Following incident
Project Manager to inform VA immediately of receipt of report of any notifiable incidents of potential or actual environmental harm.	PCM	Following incident
Where warranted DES Pollution Hotline (1300 130 372) or the local office shall be contacted as soon as practicable after becoming aware of any release of contaminants.	PCM VA	When required
Corrective Action	Responsibility	Timing
All complaints relating to fuels, chemicals or hazardous material use shall be investigated promptly and appropriate actions taken.	PCM VA	Upon receipt of complaint
Disposal of contaminated soil (small or large quantities) shall be disposed of in accordance with relevant regulations.	PCM	Following incident response
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	PCM VA	Where required

Spills to be remediated depending on nature of product (Project Manager to advise correct procedure). Immediate action should include: <ul style="list-style-type: none"> Small hydrocarbon spill (terrestrial): apply absorbent material. Large hydrocarbon spill: install containment (e.g. block drains, surround with sandbags, dig earthen bund) and apply absorbent material. Chemical spill: application of appropriate absorbent material and containment. Aquatic spills: implement spill kit with appropriate air boom and oil and fuel absorbent boom immediately. 	PCM/Site Supervisor	Following incident
In the event of a spill of dangerous goods, work procedures and control measures shall be reviewed to ensure they are fit for purpose and revised where necessary.	PCM	Following incident where required
In the event of an environmental incident, corrective or remedial action shall be taken as is required to render the area safe and avoid or minimise environmental harm.	PCM	Following incident where required

4.7 Waste

4.7.1 Aspect and Impacts

Waste will be generated at work sites as a result of construction activities. This includes construction waste (steel, packaging, plastics, etc.) and personnel waste (sewerage, general rubbish). Most waste will be generated at the solar farm construction site, with minimal waste expected during trenching / HDD operations. Waste materials are to be managed and disposed of in such a way as to avoid land contamination, maintain visual amenity and to reduce the proclivity of waste from attracting fauna and pest species animals.

4.7.2 Management Plan

Environmental Objective		
To prevent or minimise the generation of wastes and to appropriately contain, control and dispose of all waste generated.		
Performance Criteria		
<ul style="list-style-type: none"> No complaints are received from regulatory authorities or the community in relation to waste issues. All works are managed in accordance with the <i>Waste Reduction and Recycling Act 2011</i> and <i>Environmental Protection Act 1994</i>. No uncontrolled waste or litter observed on site. Appropriate storage and disposal of waste evident on site. 		
Mitigation Measures	Responsibility	Timing
Adopt the waste management hierarchy (i.e. avoid, re-use, recycle, energy recover and disposal).	PCM	Where practicable
Waste materials shall be contained on site (solar farm) in appropriate containers. Organic and general domestic waste containers are to be sealable and the waste storage/collection is to be fenced and secured from wildlife accessing the organic waste.	Site Supervisor	At all times
General housekeeping shall be undertaken on an ongoing basis to keep work sites clean.	Site Supervisor	Daily

All wastes, (including regulated waste) shall be collected and removed from work sites regularly by an appropriately licensed contractor, (as required).	Site Supervisor	Throughout construction
Portable ablution facilities are to be provided on site and disposal of waste shall be to an appropriately licenced facility approved to take such waste.	PCM	At all times
Any wastewater, (e.g. dewatering) shall be collected and appropriately disposed of in accordance with direction and conditions of approvals.	PCM	At all times
General waste transport shall be conducted in a manner that does not cause littering or unlawful waste disposal.	PCM	Throughout construction
Prohibit the discarding of cigarette butts to the ground.	Site Supervisor	At all times
Non-recyclable materials/wastes (including foods, regulated and hazardous wastes) are stored in appropriate areas and are disposed of at licensed landfill sites according to regulatory requirements.	PCM Site Supervisor	At all times
On the completion of works, the site shall be cleared of all rubbish and waste and left in a clean tidy condition.	PCM Site Supervisor	Prior to leaving site
Monitoring	Responsibility	Timing
Regular inspection of on-site facilities shall be undertaken to ensure waste is being generated, stored, handled, disposed and transported in accordance with regulations.	PCM	Daily
Monitor housekeeping activities to ensure waste is contained appropriately and site is clean at all times.	Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
All personnel to report incidents where waste material has been a contributing factor.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	PCM	Throughout construction
Inform VA in a timely manner in the event of a significant waste management issue.	PCM	Following identification
Corrective Action	Responsibility	Timing
All complaints relating to waste issues shall be investigated promptly and appropriate actions taken to clean up the affected area and manage the waste generated.	PCM	Upon receipt of complaint
Where investigations show unacceptable waste management, revision to management plans shall be undertaken and further controls implemented, as necessary.	PCM	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	PCM	Where required

4.8 Flora

4.8.1 Aspect and Impacts

All native vegetation within the project study area (road reserves) is considered to be important habitat for species (both flora and fauna) that are considered endemic, rare/threatened, or otherwise represent natural values of outstanding values.

Subsequently, a key element in demonstrating environmental sustainability and responsible environmental management will be the requirement to avoid disturbance, both direct and indirect, to any native vegetation within the road reserve.

To the above ends, surveys mapping and recording native vegetation values, areal extent and contribution to habitat values have been undertaken since 2021 along the entire road reserve construction area and the solar farm generation site. The purpose of the surveys have been to inform the design process such that construction methodologies for the laying of cables within the road reserve reflects best practice methodology to avoid native vegetation disturbance.

The resulting design parameters include:

- Where feasible and practical, cables will be co-located with the existing Telstra communication cable trench which is similarly installed underground along the road reserve. This can only be done where vegetation clearing/disturbance is not required, noting that vegetation regrowth has occurred over areas of Telstra cables. Co-locating of cables may not be possible in a number of areas, and can only occur where technical compatibility between the cable networks is assured, and vegetation is not required to be disturbed.
- Where there is a clearway of at least 1.5 m on the side of the formed road surface, i.e., is devoid of native vegetation and is subject to the regular road side maintenance regimes (slashing of grasses and regrowth) of Douglas Shire Council, then laying of cables within a trench that is dug by cable plow or trench excavator, will be the preferred construction methodology.
- Where no clearway is present on the road shoulder, and HDD cannot be undertaken, then trenching will occur directly within the formed road surface with road surface to be reinstated after installation.
- Where there is insufficient clearway for trenching to avoid native vegetation disturbance, horizontal direction drilling beneath or immediately adjacent to the formed road surface will be undertaken. Set up and draw pits will be established either directly within one lane of the road, or in existing cleared areas.

This EMP management element will be updated prior to construction when final conditions on approvals from all agencies are available.

4.8.2 Management Plan

Environmental Objective		
To ensure NO disturbance to native vegetation and surrounding ecosystems in order to maintain environmental quality and natural values of the surrounding areas.		
Performance Criteria		
<ul style="list-style-type: none"> • No complaints are received from regulatory authorities or the community in relation to flora and fauna management. • No native vegetation communities are impacted directly, or indirectly, by construction activities associated with the project. • All works are managed in accordance with conditions on the Development Permit Douglas Shire Council, <i>Wet Tropics Plan 1998, Nature Conservation Act 1992, Vegetation Management Act 1999, Fisheries Act 1994</i> and any other relevant legislation and regulatory requirements. • All works to comply with conditions on WTMA permit and any other regulatory approval or agreement. • Non-native vegetation disturbance e.g. slashing of introduced road side grasses, is restricted to only the minimum as required for the safe construction and maintenance of the distribution cables and is undertaken in consultation with DSC road maintenance operator. 		
Mitigation Measures	Responsibility	Timing
PCM to engage with Douglas Shire Council road maintenance operations to ensure that existing road maintenance practice and policy with respect to management of non-native vegetation (grass slashing for example) are adhered to.	PCM	Prior to construction..

The area of vegetation/habitat to be avoided at all HDD set up and draw pits shall be demarcated by bunting/site tape/ safety mesh.	Contractor PCM	Prior to works commencing on site
No erosion and sediment control structures will require disturbance of native vegetation, nor shall any ESCP structure direct water flow to adjoining habitat, but shall be directed to the existing roadside drainage network.	Contractor PCM	Prior to works commencing on site and throughout construction,.
Non-native vegetation disturbance is to be totally restricted within the road reserves to grassed areas that otherwise are normally maintained by DSC maintenance crews.	PCM Contractor	Prior to works commencing on site
Provisions are to be included in the construction design to alter the proposed construction methodology (i.e., locations of HDD vs trenching), should any parameters as identified during construction not accord with the requirements to avoid native vegetation clearing.	PCM Contractors VA	Throughout construction
Machinery that has recently been used in earthworks/vegetation clearing in a biosecurity restricted zone is to have an approved biosecurity/weed hygiene certificate prior to crossing the Daintree River.	Site supervisor, PCM	Prior to, and throughout construction.
All machinery generally to be washed down prior to earthworks operations. This extends to trenching equipment and small vehicles (bobcats, dingos and similar vehicles) accessing the site for the first time. Washdowns are to occur prior to mobilising to sites at a specialised washdown bay is to be established at the solar farm construction area.	PCM Site Supervisor	Prior to works commencing on site
Monitoring	Responsibility	Timing
Ensure any native vegetation delineation bunting is maintained and vegetation beyond this bunting is not disturbed.	Site supervisor	Daily
Undertake routine visual inspections of all erosion and sediment control measures to ensure no discharge are occurring into adjoining vegetation	Site supervisor	Daily
Undertake routine visual inspections of trenching and HDD set up/drawing pit areas to ensure that requirements to avoid		
Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Any observed failure of any ESCP structures are to be reported immediately.	All personnel	At all times
Any native vegetation disturbance (including failure of clearing, significant limb or root damage) is to be reported immediately	All personnel	During clearing
Inform the Administering Authority (DSC/WTMA/DES) in a timely manner in the event of a significant environmental management issue, e.g. earthworks and sedimentation from trenching/ HDD set up on the Daintree National Park.	VA PCM	Following identification
Corrective Action	Responsibility	Timing
All complaints shall be investigated promptly and appropriate actions taken.	PCM	Upon receipt of complaint
Where investigations identify vegetation removal or damage to the adjacent NP as a result of accidental clearing, revision to management plans shall be undertaken and further controls implemented, as necessary.	PCM	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	PCM	Where required

4.9 Fauna Interactions

4.9.1 Aspect and Impacts

Fauna interactions requiring management approaches are at highest likelihood of occurrence during the construction program. Habitats for a broad range of fauna considered endemic, iconic, or otherwise of regulatory conservation significance are represented throughout the project area. These habitats are represented primarily throughout the road reserve area by areas of native vegetation, waterways and wetlands. The solar farm location is not considered an important fauna habitat area owing to the existing highly degraded (cleared) state dominated by introduced grasses. Fauna interactions during construction at the solar farm is unlikely to occur.

Notwithstanding, Buchanan Creek, outside of, but adjacent to the solar farm, offers important habitat connections on the western boundary of the construction areas. It is thus probable that fauna using this habitat may come into contact with personnel, and construction activities at the solar farm.

Fauna interactions during the cable trenching and laying construction activities have a likely probability of occurrence, notably with cassowaries and snakes. Mammals, other birds, and mobile reptiles have a lower probability of being encountered during construction owing to:

- No native vegetation providing habitat resources to native fauna is proposed to be disturbed during construction.
- Implementation of general habitat protection measures including installation of erosion and sediment control measures where required, and directing water flow away from habitats into existing road side drains.
- Noise and vibration commensurate with normal road side maintenance and road works will deter mobile fauna, typically reptiles, birds (including cassowaries) and mammals away from the disturbance area.

Other general mitigating factors include:

- Traffic and machinery movement will be entirely during the day, with no construction activity or construction machinery movement to occur in the evenings.
- Communal use of buses to transport personnel to/from the central mustering point at the solar farm prior to work each day.
- Adoption of fauna-friendly design features such as containerised and enclosed structures, simple chain mesh security fencing with no use of barbed/razor or any other type of entangling wires, use of low intensity and directional shielded security lighting (movement activated) at the solar farm.

Notwithstanding the above, there are a number of management requirements with respect to fauna that are to be observed throughout construction. This Fauna Interaction Element relates to all other aspects in this EMP.

4.9.2 Management Plan

Environmental Objective
To ensure no disturbance of native vegetation and surrounding ecosystems in order to maintain environmental quality and natural values of the surrounding areas.
To ensure water quality of perennial watercourses and wetlands remains commensurate with the maintenance of habitat requirements for aquatic fauna species.
To minimise the potential for adverse interactions with fauna through the incorporation of fauna sensitive design and education of contractors.
To minimise risk to fauna generally during the construction of the solar farm and during cable laying activities

Performance Criteria		
<ul style="list-style-type: none"> No complaints are received from regulatory authorities or the community in relation to flora and fauna management. All works are undertaken in accordance with conditions from Douglas Shire Council development permit and operational works approvals. All works are managed in accordance with the <i>Wet Tropics Plan, Nature Conservation Act 1992, EPBC Act</i>, and any other relevant legislation. All works to comply with conditions on WTMA permit and any other regulatory requirements. No native habitat disturbance is No adverse impacts are noted in any waterway or wetland arising from construction activities. No sediment from trenching or HDD operations enters any watercourse, wetland, or native vegetation. No off-site sediment transport from the solar farm construction site is noted in Buchanan Creek . No fauna deaths or injuries occur at any stage during the construction project. All contractors working within the Project Area are inducted into fauna interaction management protocols. 		
Mitigation Measures	Responsibility	Timing
All aspects related to all Elements in this EMP are to be implemented to minimise potential for adverse fauna interaction, including habitat disturbance.	VA PCM Site Supervisor All project staff	At all times
Barbed wire, razor wire, and any other material capable of entrapping or snaring wildlife is not to be used in any aspect of design or construction for the project.	PCM	Construction and operation
Security lighting at the solar farm are to be installed as low as possible, use motion-sensing technology, be of shielded directional LED optics and preferably of amber or red output.	PCM	Construction and operation
No evening construction or machinery / materials transport is to occur throughout the project construction phase. Afterhours work to be limited to emergency requirements for repair / maintenance only.	PCM	Throughout construction
Venomous snakes and cassowaries may be encountered. Staff are not to handle snakes and snakes are to be removed to a safe location away from construction only by a qualified snake handler. All staff shall be inducted into strategies for dealing with the local cassowaries by CMP/Site Supervisor or delegate.	All project staff	At all times
There is to be no construction traffic using local roads between the hours of 6 pm and 6 am to avoid risk of road kill/injury.	Site Supervisor	At all times
Feeding of animals or interfering with animals shall not be permitted.	All project staff	At all times
Construction personnel to use communal project transport / vehicle for travel to / from project office at solar farm to avoid further vehicle traffic on local roads.	VA PCM	Throughout construction
Bentonite (inert clay) is to be the only drill mud lubricant used during HDD operations. No acid or other chemical substitutes are to be used.	PCM Contractor	Throughout construction
Prohibit domestic pests and animals on the site during construction.	PCM Site Supervisor	Throughout construction
All emissions (noise and exhaust) of machinery and equipment are to be compliant with manufacturers specification.	Site Supervisor	At all times
Ensure that all erosion and sediment control mechanisms are in place that reduce the risk of off-site transport of sediment into adjacent habitats.	Site Supervisor	Throughout construction
No cable trenches are to be left open overnight, but are to be infilled and secured at the end of each work day to ensure wildlife is not trapped in any trench.	Site Supervisor	Throughout construction

Do not leave food waste scraps or any other waste that is likely to attract wildlife. All waste disposal is to be at a designated waste transfer station at the solar farm project office site.	Site Supervisor	Throughout construction
Delineation bunting to be used to demarcate sensitive habitat areas that are not to be disturbed, e.g. edge of riparian vegetation, and is to be placed prior to work commencing on site.	PCM Site Supervisor	Prior to works commencing on site
Should any animals be encountered, injured or nests discovered, works shall cease and the Site Supervisor be notified immediately.	Site Supervisor	As required
In the event that injury to native fauna occurs, where practicable, it shall be transported to a local veterinary clinic, wildlife carer or reported to local Queensland Parks and Wildlife Services (QPWS) for advice/action. Contact numbers are: <ul style="list-style-type: none"> RSPCA Queensland: 1300 264 625 (for reporting injured or orphaned wildlife) Daintree Wildlife Rescue: (07) 40980 7284 (for reporting injured or orphaned wildlife). 	Site Supervisor	As required
Monitoring	Responsibility	Timing
Ensure habitat delineation bunting is maintained and habitats beyond this bunting are not disturbed e.g., by sediment from construction works.	Site Supervisor	Daily
Undertake routine visual inspections of all erosion and sediment control measures.	Site Supervisor	Daily
Undertake routine inspection of all riparian and instream areas during trenching/HDD operations in these areas for any obvious signs of aquatic impacts, e.g. sedimentation, contaminants, fish kill/injury, etc.	Site Supervisor	Daily
Routine inspection of construction machinery to ensure no leakage of hydrocarbons (oils, fuels, etc) is occurring and all exhaust systems are in good order.	Site Supervisor Contractor	Daily
Undertake routine inspection of all construction areas within the solar farm at the start of works each day to ensure no fauna has entered or is trapped within work areas. This includes the perimeter security fence of the solar farm.	Site Supervisor	During clearing
Reporting	Responsibility	Timing
All personnel to report incidents involving wildlife interactions where the animal is observed to be injured, distressed, trapped or deceased. This includes observations on instream fauna (e.g. fish, reptiles).	All personnel	At all times
Any vegetation habitat disturbance outside of the demarcated bunting is to be reported immediately to the Site Supervisor and PCM. All work is to immediately halt in that area until a directive is issued by the PCM	Site Supervisor All personnel	During clearing
Record and manage all wildlife interactions in a register and corrective actions taken. This will include spotter catcher reports documenting any wildlife identified during clearing, (if required) and measures deployed to minimise impacts.	Site Supervisor	Following identification
Inform the relevant Administering Authority immediately in the event of any contravention of a condition on an approval/permit issued by that Administering Authority.	VA PCM	Following identification
In the event of any environmental incidence arising from conditions not as a result of construction works (storm events, floods, vehicle accidents in works area), these are to be reported to VA and the PCM	VA PCM Site Supervisor	Following identification

Corrective Action	Responsibility	Timing
All complaints shall be investigated promptly and appropriate actions taken.	VA PCM	Upon receipt of complaint
Where significant mortality or injury to fauna has occurred to fauna of conservation significance, e.g. Cassowary,, then activity in the affected area resulting in the incident will cease until actions agreed with regulatory agencies and VA have been implemented.	VA PCM Site Supervisor	Following identification
Where investigations identify environmental nuisance or potential to harm fauna, revision to management plans shall be undertaken and further controls implemented, as necessary.	PCM VA	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities generally in the event of any report on injury/mortality to fauna, or impact on their habitats outside of the demarcated disturbance area.	VA PCM	Where required

4.10 Biosecurity Management

4.10.1 Aspect and Impacts

Private freehold land along all road reserves are a potential major source for non-native plant species. Trenching earthworks adjacent freehold land where non-native species are present, could possibly introduce additional exotic species or create favourable habitat conditions for other weeds and pests.

There is a high potential for the introduction of major environmental weeds (e.g. Miconia/Mikania) or fauna pests (electric ants/yellow crazy ants) with machinery or equipment that may have been in contact with problematic infested areas elsewhere in North Queensland. Electric ants and yellow crazy ants are a biosecurity risk in North Queensland. All machinery and construction equipment must be inspected prior to arrival on site (inspection to be south of the Daintree River) for evidence of electric ants or yellow crazy ants.

It is necessary to implement a weed and pest hygiene management plan that includes washdown of earthworks vehicles prior to accessing the electric ants work site and a pest (weed and fauna) south of the Daintree River prior to initial mobilisation to north of the river. A second washdown station is to be established at the solar farm project office area for ongoing washdowns as required for earthworks equipment. Any earthworks equipment that has been operating in road reserves fronting developed properties are required to use the project washdown facility prior to any earthworks commencing within the DMG project area.

4.10.2 Management Plan

Environmental Objective		
Avoid and effectively manage potential impacts associated with weeds and pests.		
Performance Criteria		
<ul style="list-style-type: none"> No introduction or spread of new (declared) weeds and pests. No electric ants or yellow crazy ants become established on site No complaints are received from regulatory authorities or the community. Works undertaken in accordance with the DSC Biosecurity Management Plan and <i>Biosecurity Act 2014</i>. All requirements of the WT Plan and supplementary guidelines to be enacted All earth moving machinery (including tip trucks) to have a certified weed hygiene certificate issued by an authorised person/department. 		
Mitigation Measures	Responsibility	Timing
All vehicles, construction machinery and materials are to be examined for electric ants or yellow crazy ants prior to arrival at site, before crossing the Daintree River at an inspection site nominated by DSC/Biosecurity Australia.	PCM	At all times
Vehicles identified as being infested will not be permitted to access the DMG project area until the vehicle has been cleaned, and inspected by a qualified biosecurity specialist and verified as being cleared of infestation.	PCM	At all times
A project construction wash down bay is to be established at the solar farm to be used by all earthworks machinery being used within the WTWHA/Daintree National Park.	PCM Site Supervisor	During clearing operations
Food scraps to be disposed of into bins with closed lids and removed from site regularly to minimise vermin infestations.	All personnel	At all times
If fill is required to be imported for construction at the solar farm site, only clean imported fill with a weed-free certificate can be used on site.	PCM	Where appropriate
Vehicles arriving on site from known and potential weed infested areas must, prior to arriving at site, undergo vehicle checks or wash down procedures preferably before crossing the Daintree River or at a weed washdown site nominated by VA/ Biosecurity Australia.	VA PCM Site Supervisor	At all times
Any weed infestation shall be treated at earliest stage while small and manageable. If chemical treatment is required, chemicals may be used only in accordance with manufacturer's specifications.	Site Supervisor	At all times
Monitoring	Responsibility	Timing
Weeds – Weekly inspection of all earthworks areas to identify any Queensland weed Classes 1 to 3 under the <i>Biosecurity Act 2014</i> .	Site Supervisor	Throughout construction, and post construction for all earthworks areas.
Electric ants– Weekly site inspection of the laydown and construction areas at the solar farm site for electric ant presence/nests, and random vehicles and equipment checks.	Site Supervisor	Throughout construction
Yellow crazy ants – Weekly site inspection of the solar farm construction and laydown areas, and random vehicles and equipment surveys.	Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
All personnel to report incidents	All personnel	At all times

All infestations of biosecurity matters, including yellow crazy ants, electric ants and weed pests in Classes 1 – 3, are to be reported to the DSC, WTMA and DAF on 13 25 23.	PCM All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	PCM	Throughout construction
Corrective Action	Responsibility	Timing
Vehicles identified as being infested will not be permitted to access the DMG project area until the vehicle has been cleaned, and inspected by a qualified biosecurity specialist and verified as being cleared of infestation.	PCM	At all times
All complaints relating to weeds or pest issues shall be investigated promptly and appropriate actions taken.	PCM	Upon receipt of complaint
Where investigations identify restricted/declared weeds, and pests are present, revision to management plans shall be undertaken and further controls implemented, as necessary. Controls may include use of contracted licensed weed eradicator or pest exterminator.	Project Manager	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities permit and approval conditions, or as a result of direction received following notification.	Project Manager	Where required

4.11 Air Quality

4.11.1 Aspect and Impacts

Dust and fumes are an aspect of the project that have limited potential to impact on receptors adjacent to and within the works area. The primary area of construction is the solar farm site, with six properties on the eastern side of Silkwood Road within 200m of works at the solar farm. Whilst prevailing winds are south-east, (directing dust and fumes away from the sensitive receptors), there is a potential for dust and fumes from earthworks activities to impact on these properties. Earthworks required for the solar farm site are minor, and comprise primarily the entry access road and site drainage.

Trenching and HDD earthworks requirements are of limited duration, temporary, and have very limited disturbance footprints. With all trenching / HDD operations, there is to be no stockpiling of soil within the road reserve.

Stockpiles are only allowed within the solar farm construction site., and must be bunded and covered whenever not in active use.

A number of sensitive native plants e.g. filmy ferns, seedlings and groundcovers in the project area, are vulnerable to smothering by dust.

4.11.2 Management Plan

Environmental Objective
To prevent fumes and other atmospheric emissions generated by construction activities (including traffic movement) from causing a hazard or nuisance to the environment and sensitive receptors adjacent the works, particularly to the properties on the eastern side of Silkwood Road.
To prevent degradation of environmental values within the WTWHA, notably any dust smothering of vulnerable flora species adjacent works area.

Performance Criteria		
<p>All works are managed in accordance with the <i>EP Act</i> and the <i>Environmental Protection (Air) Policy 2008</i>.</p> <p>No complaints are received from regulatory authorities or adjacent landholders in relation to dust and fumes impacts</p> <p>No dieback of understorey/ground cover species noted in adjoining vegetated areas.</p> <p>No visible dust accumulation in pools of Buchanan Creek adjacent the western solar farm boundary, watercourses or other drainage features in the construction areas.</p>		
Mitigation Measures	Responsibility	Timing
Ensure equipment is properly serviced, with records provided. If excessive exhaust fumes are observed to be emitted, vehicles to be shut down and maintenance check undertaken offsite.	Site Supervisor	Throughout construction
Work hours are limited to daylight hours only, nominally 7am to 5pm Mon to Sat. There is to be no night time work, except for emergency maintenance/repairs.	PCM Site Supervisor	Throughout construction
During hot/dry conditions, dust monitoring stations are to be established along Silkwood Road to establish monitoring baselines for potential impacts on adjacent landholders.	PCM Site Supervisor	Throughout construction
Silkwood Road is to be watered whenever monitoring indicates dust from project traffic on this road exceeds thresholds considered to be a potential issue or complaints are received from adjoining residences.	PCM Site Supervisor	Throughout construction
Burning or incineration of waste is not permitted at any work site.	Site Supervisor	At all times
When not in use, vehicles and other onsite equipment are to be turned off.	Site Supervisor	Throughout construction
No earth stockpiles are allowed within the road reserve, except as temporary measures for the duration of the construction activity within a single day.	Site Supervisor	Throughout construction
Stockpiles of earth at the solar farm site must be appropriately bunded and covered when not in active use.	Site Supervisor	Throughout construction
Any earth spoil from HDD operations deemed reusable by Douglas Shire Council (as recovered road base material), is to be removed to a location as agreed with Council	VA PCM	Throughout construction
The speed of vehicles on access roads to comply with all speed limits, and off site limited to speeds set by the Project Construction Managers.	PCM Site Supervisor	Throughout construction
Ensure water trucks are used, if necessary, along Silkwood Roads, laydown areas and within construction areas within the solar farm site.	PCM Site Supervisor	Where necessary
Disturbed areas, including working areas shall be stabilised as soon as possible.	PCM Site Supervisor	Throughout construction
Monitoring	Responsibility	Timing
Undertake visual inspections / observations of site during day to day works, to identify problem areas and where corrective action is needed. This includes watercourses, drainage lines and adjacent vegetation, notably Buchanan Creek to the immediate west of the solar farm construction site.	Site Supervisor	Daily
Monitoring of Silkwood Road condition to ensure that dust raised by project traffic is managed appropriately.	Site Supervisor	Under hot/dry conditions
Dust monitoring recorders to be implemented along Silkwood Road and records to be kept and maintained of all dust emissions in this locality.	Site Supervisor	Daily

Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	PCM	Throughout construction
Corrective Action	Responsibility	Timing
Appropriate control measures as identified in this EMP shall be implemented in a timely manner where nuisance dust and other air quality issues are identified.	PCM	Following identification
Any responses to complaints from properties adjacent the solar farm are to be implemented and recorded in consultation with the PCM.	PCM Site Supervisor	Following identification
Silkwood Road and solar farm site to be watered down under hot/dry conditions favouring dust generation.	PCM Site Supervisor	Following identification

4.12 Noise and Vibration

4.12.1 Aspect and Impacts

Noise and vibration are only likely to be potential issue to those six properties within an average of 200m of the solar farm construction site. These properties include a mix of commercial (Epiphyte Air B & B) and residential accommodation. Noise and vibrations from construction will arise from the following:

- General earthmoving and construction machinery activity.
- Machinery and traffic movement along Silkwood Road
- General construction personnel movement and noise.

The above activities will impact on properties along Silkwood Road with varying intensities at different times during construction. Noise from general construction activities, machinery, traffic movement and human presence will deter cassowaries (and most other fauna) from utilising the solar farm work area during construction. The solar farm construction will also be security fenced at an early stage which will further protect fauna from on-site activities during the construction duration.

Noise and vibration arising from trenching/cabling and HDD activities is commensurate with impacts typical of existing road maintenance regimes by Douglas Shire Council, which include using tractors/slathers, mowing equipment, and general road works (bitumen repairs, bridge/causeway maintenance, minor earthworks and culvert repairs etc). Noise and vibration will be temporary, during daylight hours only, not anticipated to have any permanent or cumulative impact on adjoining habitats and their fauna.

4.12.2 Management Plan

Environmental Objective
To minimise noise impacts and vibration from construction activities on landholders adjacent to construction works area including the solar farm, and fronting the road reserve network.
To limit the adverse impact of noise and vibration from construction, on wildlife around the construction areas generally.

Performance Criteria		
<ul style="list-style-type: none"> All works are managed in accordance with the EP Act and the Environmental Protection (Noise) Policy 2008. No complaints are received from regulatory authorities or the community in relation to noise and vibration issues. Noise limits, timing and duration are within Landholders along Silkwood Road remain informed at all times of works program. Landholders adjacent trenching/HDD areas to be notified of expected date of construction in their vicinity. 		
Mitigation Measures	Responsibility	Timing
Landholders on Silkwood Road are to be provided with an indicative work program with the timing, extent/location and duration of construction activities. The Project Construction Manager are to ensure construction is compliant with the work program. Any deviation to the work schedule/program is to be communicated immediately to landholders.	VA PCM	Prior to construction and as required when work program is amended.
Where possible, plant with the lowest noise rating which meets the requirements of the task shall be selected.	Site Supervisor	Throughout construction
Construction activities are to be undertaken during normal construction hours, (e.g. 7.00 am to 5.00 pm, Monday to Saturday).	PCM	Throughout construction
Equipment will be switched off when not in use if safe to do so.	Site Supervisor	When not in use
The noise of generators is controlled by design, and the generator is enclosed within a sound insulated building with a noise level less than 65 dBA when measured from a distance of 7 metres	PCM	Throughout and post construction
Provide appropriate hearing protection to all workers if noise levels exceed the 85 dBA limit for protection of workers health.	Site Supervisor	As required during construction
Where possible, limit obtrusive construction activities to times that minimise noise impacts to Silkwood Road landholders.	PCM Site Supervisor	Throughout construction
All vehicles and equipment to be maintained in good working order and serviced according to manufacturer's recommendations to avoid unnecessary nuisance.	Site Supervisor	Throughout construction
Site induction training to advise personnel of requirements to limit unnecessary revving of engines, engine braking and to exercise due courtesy of local residents, accommodation premises and other workers.	PCM Site Supervisor	During induction
Monitoring	Responsibility	Timing
Records of plant maintenance shall be kept on-site and/or with plant machinery.	Site Supervisor	Throughout construction
Operators shall undertake and log daily pre-start checks to ensure equipment is well maintained.	Operators and Site Supervisor	Daily
Undertake daily observations during construction as to the effectiveness of noise control measures and the control of excessive noise.	Site Supervisor	Daily
In the event of any complaint, noise monitoring equipment to be installed as per installation	PCM	As required
Reporting	Responsibility	Timing
All personnel to report complaints received and any obvious noise or dust effects.	All personnel	At all times
Noise monitoring results (if required to be undertaken) is be reported by PCM to VA	PCM VA	
Record and manage all complaints in a register and corrective actions taken.	Site Supervisor PCM	Throughout construction

Corrective Action	Responsibility	Timing
All complaints shall be investigated promptly and appropriate actions taken.	PCM	Upon receipt of a complaint
If monitoring identifies noise to be in excess of Environmental Protection (Noise) Policy 2008 for those activities, and/or is more than 65 dBA when measured from a distance of 7 metres then corrective action to remedy source problem to be undertaken	PCM	Where required
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	VA PCM	Where required

4.13 Emergency Response

4.13.1 Aspect and Impacts

On any construction project there is potential for an emergency situation to occur, such as fire, chemical release, spill, fuel/oil leaks, snake bite, equipment failure or any other likely emergency. While the potential is low, some wildlife interactions (stinging trees, venomous snakes, cassowaries) may also require an emergency response. All emergency situations have the potential to cause damage/injury/impact to personnel and environment.

There is also the risk of electrical hazards that may require emergency responses.

4.13.2 Management Plan

Environmental Objective		
For project personnel to respond effectively and efficiently in the event of an emergency associated with any aspect of the project		
To ensure that any response is commensurate with the identification and mitigation of risks to the natural environment.		
Performance Criteria		
<ul style="list-style-type: none"> Emergency plans for construction developed prior to commencement of works on site. All personnel familiar with emergency procedures and their role in the event of an emergency. 		
Mitigation Measures	Responsibility	Timing
An appropriate spill kit, personal protective equipment and relevant operator instructions and emergency procedures for the management of wastes and chemicals associated with construction must be kept at the site. This includes a spill kit that is to be available to all cable laying equipment during construction.	PCM/Site Supervisor	At all times
Records shall be kept on chemicals and dangerous goods used during construction.	PCM	Throughout construction
All personnel engaged in any aspect of live electrical work are to be suitably trained and qualified in their areas of experience to undertake the work required.	PCM	Throughout construction
First aid and firefighting equipment (hand held extinguishers and fire hoses) shall be available at all construction sites.	PCM	At all times
Construction workers operating vehicles on-site to be appropriately trained and licensed, so that these vehicles are operated in a safe and appropriate manner. All vehicle operators to be briefed on locations of maintenance, storage and refuelling areas.	PCM	During induction
All relevant staff shall be trained in appropriate handling, storage and containment practices for chemicals and dangerous goods to be utilised during construction.	PCM	During induction

No fuel or hazardous substances are to be stored outside of the solar farm laydown area. All such substances are only to be stored, transported and used in accordance with relevant Australian standards (AS), guidelines and legislation, including: <ul style="list-style-type: none"> • <i>Dangerous Goods Safety Management Act 2001</i> • Regulatory requirements • Safety Data Sheets (SDS) requirements. SDS for products kept on site shall be readily available.	PCM	At all times
Important contact numbers and names to be available on site e.g. 000 for fire, ambulance, police, DES Pollution Hotline	PCM	At all times
Personnel to undertake adequate environmental awareness and training covering the requirements of this EMP and other management plans regarding emergency response.	Site Supervisor PCM	During induction
An emergency response plan shall be prepared which includes consideration of the following – <ul style="list-style-type: none"> • Response procedure in the event of a fire, chemical release, spill, leak, explosion, natural disaster, equipment failure, wildlife or any other likely emergency • Communication arrangements and contact details • Roles and responsibilities of project personnel • Emergency controls and alarms • Evacuation procedures • Training requirements • Site security. 	Project Manager	Prior to commencement of works on site
Monitoring	Responsibility	Timing
Undertake review of the emergency response plan to identify any issues and check information is up to date.	Site Supervisor	Throughout construction
Review all potential work areas and activities that have the potential to create emergency situation prior to commencement of work	Site Supervisor	Throughout construction
Conduct drills if necessary.	Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Any personnel or environmental emergencies can be reported by all personnel, and recorded by Site Supervisor including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence.	All personnel Site Supervisor	Following incident
Inform the PCM and Site Supervisor immediately of any incidents resulting in potential or actual environmental harm.	All personnel	Following incident
Project Manager to inform VA immediately of receipt of report of any notifiable emergencies of potential or actual harm to personnel or environment.	PCM	Following incident
Corrective Action	Responsibility	Timing
Where investigations identify inefficient or ineffective procedures, revision to management plan shall be undertaken and further controls implemented as necessary.	PCM VA	Following identification

4.14 Water Quality Management Plan

4.14.1 Aspect and Impacts

Minimising the potential for project impacts on water quality is a key aspect in maintaining and protecting natural aquatic values. Many of the waterways in the project area support vegetation communities providing habitat to endemic and threatened flora and fauna and have important cultural heritage values to the Eastern Kuku Yalanji traditional owners.

The following management plan is a summary of all those aspects and requirements from other elements in this EMP as relevant to the maintenance of aquatic environmental values and to meet the WOQ of the EPP (Water) 2009.

4.14.2 Management Plan

Environmental Objective		
<p>To minimise the potential for impacts to adjoining habitats in freehold, WTWHA, Daintree National Park and environmental values in general for the DMG project area.</p> <p>To ensure that the environmental values of water courses are maintained through construction activities achieving the WOQ of the EPP (Water) 2009 as relevant to these areas.</p>		
Performance Criteria		
<ul style="list-style-type: none"> The WOQ parameters under Tables 2.1, 2.2 and 2.3 of the <i>Daintree and Mossman Rivers Basins Environmental Values and Water Quality Objectives, Basins Nos. 108 and 109 and adjacent coastal waters</i> relevant to HEV 3001 are not exceeded by any construction activity. There is no diminution of any environmental values within the road reserve construction project footprints, or within Buchanan Creek (upstream and downstream) of the solar farm construction area. . All works are managed in accordance with the International Erosion Control Association (IECA) Best Practice Erosion & Sediment Control Guidelines, the Environmental Protection (Water) Policy 2019 and any other relevant approval and statutory requirement as per conditions on permits and approvals. 		
Mitigation Measures	Responsibility	Timing
A visual water quality monitoring program is to be developed and maintained throughout construction for any perennial waterway that traverses the project construction disturbance footprint.	PCM	Prior to construction
Where any parameters exceeding the levels identified in the WOQ relevant to the watercourses of the project area are recorded, then an investigation into activities potentially influencing these results is to occur and results documented. Actions in relation to these exceedances will be set by conditions on permits/approvals from the regulatory/Administrating Authorities.	PCM Site Supervisor	At all times
No HDD set-up pit/drill rig is to be established within 50m of a perennial watercourse to avoid the potential for spillages of hazardous material (e.g. fuels/oils) from operating machinery, and minimise risk for unexpected soil erosion and sediment transport into watercourses. Draw-pits may be established within 50m of a perennial watercourse but maintain a minimum of 20m from the edge of the high point of the bank.	PCM Site Supervisor	At all times
An appropriate spill kit, personal protective equipment and relevant operator instructions and emergency procedures for the management of wastes and chemicals associated with construction must be kept at all works sites. This includes a spill kit that is to include air boom and fuel and oil absorbent boom to be available at all times.	PCM Site Supervisor	At all times
A site and works specific Erosion and Sediment Control Plan (ESCP) shall be developed prior to disturbance works (e.g. solar farm construction, trenching activities) occurring. The ESCP shall address (at a minimum): <ul style="list-style-type: none"> Laydown and storage areas within the solar farm site All areas used as stockpiles within the solar farm site. Trenching areas adjacent wetlands, waterways and riparian vegetation 	PCM Various specialised subcontractors (e.g. HDD operators)	Before commencing earthworks

<ul style="list-style-type: none"> Protection of high value habitats adjacent open trenching areas. HDD set up and draw pits. Protection of Buchanan Creek adjacent the solar farm site. Ancillary infrastructure e.g., transformer kiosks, along the distribution network. Protection of culverts, causeways, bridge approaches, and any other location in vicinity to water courses where open earthworks are required. 		
Visual inspections of work sites to ensure no oil leaks, hydraulic fluid leakages or fuel leakages/spills of any other hazardous material.	Site Supervisor	Throughout construction
No waste or any type is to be left in proximity to riparian areas. All waste is to be removed from work areas and returned to suitable disposal sites at the solar farm project site prior to removal to lawful waste disposal area.	Site supervisor,	Site clearing
<p>All fuel or other hazardous substances are to be stored at the designated areas at the solar farm site. Transport and use of any of these materials shall be undertaken in accordance with relevant Australian standards (AS), guidelines and legislation, including:</p> <ul style="list-style-type: none"> <i>Dangerous Goods Safety Management Act 2001</i> Regulatory requirements Safety Data Sheets (SDS) requirements. <p>SDS for products kept on site shall be readily available.</p>	PCM	At all times
All waterways will be traversed either by underground HDD, or by affixing to existing structures. There is to be no disturbance of the bed, banks and riparian areas of any waterway in the project area.	PCM	At all times
In the event that any fish or aquatic life is noted as injured or dead, then any works in the immediate vicinity will cease until the cause of the injury or mortality is located (where possible).	Site Supervisor	On identification
Monitoring	Responsibility	Timing
Undertake routine visual inspections of all erosion and sediment control measures..	Site Supervisor	Daily
Undertake routine inspection of all riparian and instream areas during construction in these areas for any obvious signs of aquatic impacts, e.g. sedimentation, contaminants, fish kill/injury, vegetation in the water etc. This includes Buchanan Creek adjacent the solar farm.	Site Supervisor	Daily
A visual water quality monitoring program is to be developed and maintained throughout construction for any perennial waterway that traverses the project construction disturbance footprint.	PCM Site Supervisor	At all times
Reporting	Responsibility	Timing
Reporting of monitoring to external agencies will be subject to conditions of approvals from the regulatory/Administrating Authorities.	PCM Site Supervisor	At all times
Any personal or environmental emergencies can be reported by all personnel, and recorded by Site Supervisor including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence.	All personnel Site Supervisor	Following incident
Inform the Project Manager (PCM) immediately of any incidents resulting in potential or actual environmental harm.	Site Supervisor	Following incident
Appropriate control measures shall be implemented in a timely manner where sedimentation or erosion issues are identified or have the potential to occur in the future.	PCM	Following identification
Restore eroded areas as soon as is practical following event and repair/install sediment control mechanism.	PCM	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	PCM	Where required

Project Manager (PCM) to inform VA immediately of receipt of report of any notifiable emergencies of potential or actual harm to personnel or environment.	PCM	Following incident
Corrective Action	Responsibility	Timing
In the event that WOQ objective parameters are identified as being exceeded than investigations to determine the likely cause of the source are to be undertaken and a review of the activity to take place.	PCM	Following identification
Where significant environmental impacts on water quality has occurred as a result of construction activities, then all activity will cease until a management approach has been agreed with the relevant regulatory authority.	PCM	Following identification
Where investigations identify inefficient or ineffective procedures, revision to management plan shall be undertaken and further controls implemented, as necessary.	Project Manager	Following identification

4.15 Traffic and Vehicle Management

4.15.1 Aspect and Impacts

A formal Traffic Management Plan (TMP) for the construction of the Daintree Microgrid Project is to be prepared independently of this EMP. This TMP will be prepared jointly between VA and independent contractors responsible for works within the road reserve. The TMP will be also be prepared in consultation with Douglas Shire Council, and will be subject to Council approval.

Heaviest traffic loads are expected for the movement of construction materials from south of the Daintree River to the lay down areas at the solar farm site. This will require the most number of vehicle movements, transporting the numerous solar panels over the Alexandra Range. These will be small trucks carrying the panels, with up to four return trips per day from Cairns carrying the panels. Estimated that there will be two weeks (non-continuous) of this activity. All movements are during daylight, and will only be to Silkwood Road and the solar farm, which will be the designated site laydown area. The other items (generator shed, battery shed, transformer etc) are modular in containers, and will average about two larger trucks (not semis) trips per day for a week. All vehicles will comply with load and dimensions restrictions as applicable to the Daintree River ferry and Alexandra Range.

HDD cable laying and trenching activities are expected to have limited vehicle activity. A typical HDD set up involves the drill rig (Vermeer or equivalent), a small dump truck to receive the drilled spoil material (drill rig spoil will go direct into a truck and not stockpiled) and a cable draw truck (the truck with the cable at the exit point. It is anticipated that up to two dump truck movements with spoil (80 m³) per day will be required between the HDD set up pit and the disposal / stockpile site over approximately a month. Including daily movement to/from set up / drill sites, and allowing for ancillary vehicles, HDD operations will typically involve approximately eight to ten vehicle movements a day for each set up (including traffic management personnel).

Trenching similarly requires low intensity vehicle movement. A single trenching machine (typically a Vermeer 750) will be in operation for approximately 90 days (not necessarily consecutive). The trenching machine will be supported by a cable truck/4 WD, traffic management vehicle, personnel vehicle (fuel, food, transport). In some areas a tractor slasher may be required to cut down guinea grass on road verge if there has been no recent road verge maintenance. A bobcat or similar and soil compactor may also operate infilling the trench. This will require a truck trip to/from each site each day. Ancillary infrastructure, e.g., transformer kiosks, will be required at various junctions along the road reserve network. These are typically small containerised structures (usual green boxes on underground cables). These will require a single truck movement carrying the kiosk from the solar farm laydown area, to the construction pad (a small concrete pad approximately 2m by 1.5m).

Specialised contractors will use their vehicles and supervise and undertake the connection work of the transformer kiosk to the various cables. Each may take a day to connect.

All personnel will be checked in and parked at the solar farm site off Silkwood Road each working day. This will include the workers bus from south of the river (or local) where required. Only vehicles essential to construction will leave the laydown area each day, with the personnel required. The only individual project vehicles parked on the road during construction will be those relevant to traffic management, project/contract management, or monitoring and auditing personnel. There will be no individual personnel vehicle parking their vehicles at work sites along the road network.

Overall, because of the specialised nature of the construction, there are not high levels of miscellaneous vehicles accessing the various road reserves. Busy periods, such as weekends, will largely be avoided for works along the main Cape Tribulation Road, and the rationalisation of construction worker personnel travel to/from site using a communal vehicle (construction bus), will similarly negate many of the vehicle congestion issues. All works, including transport, are during normal daylight working hours, and with strict traffic management at the construction sites, there is no anticipation of any high risk fauna/private traffic/machinery/transport interactions in excess of what currently occurs on the Cape Tribulation Road.

4.15.2 Management Plan

Environmental Objective		
To minimise the potential for adverse interactions between Daintree Microgrid Project traffic and machinery with fauna. To minimise the potential for social disruption related to traffic and machinery movement and use on the roads within the general project area.		
Performance Criteria		
<ul style="list-style-type: none"> All project vehicle traffic and machinery movement complies with the Traffic Management Plan as approved by Douglas Shire Council and VA There are no adverse vehicle/fauna interactions as a result of non-compliance with the Traffic Management Plan There are no notifiable incidents involving local traffic and Daintree Microgrid Project machinery or vehicles. 		
Mitigation Measures	Responsibility	Timing
TMP will be prepared jointly between VA and independent contractors responsible for works within the road reserve. The TMP will be prepared in consultation with Douglas Shire Council, and will be subject to Council approval.	VA/PCM Individual contractors	Prior to construction
All project traffic is to comply with existing weight/load and dimension restrictions as may be applicable to any section of the project road network.	PCM	At all times
All project construction activity (including transport of materials to the laydown area at the solar farm) are to be in within normal daylight working hours 7am to 5pm, and avoid travelling at dawn and dusk, which are fauna vulnerable impact times.	PCM	At all times
There are no night movements of traffic for construction, or of personnel vehicles as all work will cease at 5pm, unless there are emergency activities, e.g. repairing erosion and sediment control structures as a result of catastrophic rain or similar after hours emergencies.	PCM	At all times
A project commuter bus will be engaged to transport general workforce personnel to/from local accommodation. Where applicable south of the Daintree River, a commuter bus will also be used to transport workforce personnel on a daily basis to/from the solar farm mustering point.	VA, PCM	At all times
The solar farm off Silkwood Road will be the sole mustering point for the Project workforce. All commuter and private traffic will be retained at this muster point during work hours,.	PCM Site Supervisor	At all times

Unless the vehicle is for specialised contractor purposes, e.g. electrical connections, there is to be no vehicle parking of workforce personnel within road reserves at any time other than for emergency requirements.	PCM Site Supervisor	Throughout construction
<p>All fuel or hazardous substances are to be stored at the designated areas at the solar farm site. Transport and use of any of these materials shall be undertaken in accordance with relevant Australian standards (AS), guidelines and legislation, including:</p> <ul style="list-style-type: none"> • <i>Dangerous Goods Safety Management Act 2001</i> • Regulatory requirements • Safety Data Sheets (SDS) requirements. <p>SDS for products kept on site shall be readily available.</p>	PCM	At all times
Monitoring	Responsibility	Timing
<p>The site supervisor is to maintain an incident log of:</p> <ul style="list-style-type: none"> • Adverse interactions between fauna and project traffic and machinery, including any incident while traversing the Alexandra Range and all project areas generally. • Private traffic near misses and actual incidents involving project traffic and machinery 	Site Supervisor	Daily
Reporting	Responsibility	Timing
Incidences involving vehicular accidents between project machinery/traffic and private traffic resulting in damage to equipment or injury to humans is to be reported a) to Police where warranted by severity of incident, b) immediately to the PCM.	PCM Site Supervisor	At all times
Inform the Project Manager (PCM) immediately of any incidents resulting in potential or actual environmental harm.	Site Supervisor	Following incident
Project Manager (PCM) to inform VA immediately on receipt of report of any notifiable emergencies of potential or actual harm to personnel or environment.	PCM	Following incident
Corrective Action	Responsibility	Timing
In the event of any notifiable incident TMP sections appropriate to the activity being undertaken at the time of the incident to be reviewed.	VA PCM	Following identification
Where investigations identify inefficient or ineffective procedures, revision to traffic management plan shall be undertaken and further controls implemented, as necessary.	Project Manager	Following identification

Attachments

Attachment A – Volt Advisory Environmental Policy



Voltadvisorygroup

Lvl 7 757 Ann Street FORTITUDE VALLEY QLD 4006

ENVIRONMENT, PLANNING AND SAFETY POLICY

Volt aims to develop enduring relationships in communities by designing and delivering efficient, reliable and low impact solutions that meet the needs of the community.

Our purpose drives our behaviours and lays the foundation of trust in the communities in which we operate.

Safety is a priority

We care about and value the people that work for Volt and the families and communities that we serve. We will create a healthy and safe work environment by supporting employees to make informed choices at home and at work.

We will achieve this through:

- Focusing on what matters
- Listening to our communities
- Empowering employees
- Striving for success
- Building collaborative partnerships
- Creating a sustainable future

Safety goals and objectives

- The health and wellbeing of the Volt team and our partners is paramount
- We eliminate risk of high potential incidents in all decisions
- Develop innovative solutions and make informed safety decisions
- We support our teams to do what's right with clear boundaries and simple rules aligned to relevant legislation and standards
- We work with regulators and suppliers, our contractors and peers to explore opportunities to improve safety

Environmental an planning objectives

- Our purpose as a company is to deliver low impact, innovative solutions
- We do this every day by minimising environmental harm and preventing pollution
- We understand our actions and activities and we work within the relevant rules, legislation and approval processes
- Our success relies on innovative designs and methods that do zero environmental harm

Attachment B – Environmental Complaints Template

ENVIRONMENTAL COMPLAINT RECORD FORM

To be completed on receiving a complaint

SECTION 1: (to be completed by person receiving the complaint)

Current Date: __/__/__	
Current Time: __:__ am / pm	
Complainant Name:	
Complainant Contact Details:	
Ph No. _____	Address: _____

Date of incident / Issue Causing Complaint: __/__/__	
Time of incident / Issue Causing Complaint: __:__ am / pm	
Location of Incident / Issue Causing Complaint:	

REASON FOR COMPLAINT

Describe clearly and in detail the circumstances leading to the incident / issue, and the incident / issue itself causing the complaint. As far as possible, verify the facts recorded, and identify witnesses.

.....
.....

Complaint reported to:	
Site Supervisor	Date: __/__/__ Time: __:__ am /
pm	
	Signed:
Project Manager	Date: __/__/__ Time: __:__ am / pm
	Signed:

DETAILS OF ANY INVESTIGATIONS TAKEN:

.....
.....
.....

CONCLUSIONS FORMED:

.....
.....
.....

ACTIONS TAKEN TO RESOLVE COMPLAINT:

.....

.....

.....

.....

.....

.....

ANY ABATEMENT MEASURES IMPLEMENTED:

.....

.....

.....

.....

.....

.....

COMPLAINT RESOLVED BY:

Name:

Position:

Signature:

The Project Manager is responsible for assuring the investigation and response to complaints. In some circumstances complaint response may be performed by the client and findings shared with the Project Manager for record.

Records of complaints must be held for five (5) years.

Appendix H – Geotechnical Report

Volt Advisory Group Pty Ltd

Daintree Renewable Microgrid

Central Generating Facility
Geotechnical Investigation

March 2023



Question today *Imagine tomorrow* Create for the future

Daintree Renewable Microgrid
Central Generating Facility
Geotechnical Investigation

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Rev	Date	Details
RevA	1 March 2023	Issued to client

	Name	Date	Signature
Prepared by:	Nathan Price	13 February 2023	
Reviewed by:	Bernie Francis	21 February 2023	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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- Appendix B Locality map
- Appendix C Investigation site plan
- Appendix D Investigation reports, photos, and explanatory notes
- Appendix E Laboratory test reports

Abbreviations

BFGL	Below finished ground level
BGL	Below ground level
CBR	California bearing ratio
CGF	Central generating facility
DCP	Dynamic cone penetrometer
FGL	Finished ground level
GITA	Geotechnical inspection and testing authority
GTA	Geotechnical testing authority
SPT	Standard penetration test
WPI	Weighted plasticity index

1 Introduction

This report presents information and advice obtained from a geotechnical site investigation undertaken for the Daintree Renewable Microgrid (DRM) project at the proposed Central Generating Facility (CGF). Geotechnical information relating to the Underground Cable Network (UCN) is provided in a separate report (our ref. PS135008-GEO-REP-002 RevA).

WSP Australia Pty Limited (WSP) was commissioned by Volt Advisory Group Pty Ltd (Volt) for our services (WSP contract dated 23 November 2022) which were carried out in general accordance with our proposal (our ref. PP141911-WSP-CNS-GEO-PRP-00001 RevA).

1.1 Investigation objectives

The objective of the investigation was to provide geotechnical advice for the design of the proposed infrastructure and access roads at the CGF, including comments on:

- Subsurface and groundwater conditions across the proposed site
- Site classification in accordance with AS 2870
- Earthquake classification in accordance with AS 1170.4
- A summary of recommended engineering properties of the materials encountered at the CGF including bulk unit weight (γ), undrained shear strength (s_u), effective cohesion (c'), effective friction angle (ϕ), Young's modulus (E), and Poisson's ratio (ν)
- An assessment of suitable foundation systems
- Comments on potential foundation options and parameters for design
- Comments on excavation conditions
- Recommended subgrade CBR values for in situ materials for preliminary design of pavements
- General geotechnical guidelines for earthworks associated with the development, including site preparations, re-use of on-site won materials and management of groundwater

1.2 Proposed development

The DRM project is a government-supported initiative aimed at establishing a renewable microgrid for the Daintree community in Far North Queensland. The microgrid is planned to feature a central generating facility (CGF) that includes:

- Six containerised battery energy storage systems (BESS), each approximately 12 metres in length and supported by three strip footings. These modules are estimated to each have a total weight of 55 tonnes.
- Two containerised LPG/hydrogen engines with a similar length and support structure to the BESS, weighing approximately 34 tonnes.
- A 110 kL water tank with a diameter of 8 metres and supported by a ring beam. This tank has an estimated weight of 120 tonnes.
- A low voltage switchboard platform supported by bored piers and weighing approximately 45 tonnes.
- An electrolyser with an estimated weight of 3.5 tonnes.

- Two high voltage switchboard platforms, three transformers, a central generating and remote monitoring unit (CGEN-RMU), two BESS inverters, transformers, and switchgear, two fuel cells, two hydrogen storage tanks, two LPG storage tanks, and ancillary lighting.
- Access roads.

The preliminary design plans for the central generating facility can be found in Appendix A, provided by Volt.

2 Background information

2.1 Reference information

In preparation of this report, we referred to the following information:

- Preliminary design drawings of the proposed development drawn by Arcadis (Appendix A).
- Topological data obtained from the 1 m Digital Elevation Model (DEM) *Queensland LiDAR Data – Nth Queensland 2009 Project*. Data has a vertical accuracy of ± 0.10 m and a horizontal accuracy of ± 0.20 m.
- Geotechnical site investigation brief (ZW-2022.11-CTV-REP-0001) developed by Volt and ZW Solutions Pty Ltd (ZW Solutions).
- Various location-based information such as geology and soils were obtained from Queensland Globe (<https://qldglobe.information.qld.gov.au>).
- Topological maps and imagery were obtained from QTopo (<https://qtopo.information.qld.gov.au>).
- Historical photographs of the site obtained from QImagery (<https://qimagery.information.qld.gov.au>).

All sources of information which were considered in the preparation of this report are included in the bibliography at the end of this document.

2.2 Site description

The proposed CGF site is in the locality of Cow Bay, approximately 85 km north-west of the city of Cairns in Far North Queensland. The site is situated on Lot 5 Plan BK157130 and is bordered by Silkwood Road to the east and the non-perennial Buchanan Creek to the west, which flows through the lot and separates it from the rest of the property. The site is also bordered to the south by the Heights of Alexandra range and rainforest. Regionally the site is relatively flat and dips slightly towards the flood plains to the north and is situated below the foothills of the Heights of Alexandra range. The sites landform type is borderline between an alluvial fan and an alluvial flood plain. The site is mostly cleared, with only a few trees scattered through the area. The site is currently used for farming cattle. Part of the site is also reserved as a gazetted road. A locality map of the site is included in Appendix B.

2.3 Site history

The history of a site was established through the examination of aerial photography from 1957 to 2021 obtained from QImagery. A brief review of these photos was conducted to provide insights into the surficial changes to the site over time. The following information summarises the findings of this review.

The site has a history of changes as seen from aerial photography from 1957 to 2021. It appears to have remained uncleared until sometime between 1962 and 1972 when part of the northern portion was cleared. The rest of the site remained uncleared until 1983/1984 (Photo 2.1 and Photo 2.2) when it was intermittently cleared until 1989, resulting in

the site being totally cleared. In the 2000 photo, the site appears to have been stripped or tilled with bare ground present. The borrow pit appears to have begun being dug around 2001 (Photo 2.3).

Included below in Photo 2.1 to Photo 2.4 is the approximate borrow pit extent as measured on-site at the time of the investigation shown in white and the proposed CGF layout shown in yellow.



Photo 2.1 Aerial photograph from 1983



Photo 2.2 Aerial photograph from 1984



Photo 2.3 Aerial photograph from 2001



Photo 2.4 Aerial photograph from 2021

2.4 Geological setting

The geological setting of the site has been established through examination of geological maps sourced from Queensland Globe and related geology reports. In addition to Queensland Globe, two maps, a 1:100,000 scaled surface geology map (Mossman - Sheet 7965) and a 1:50,000 scale soil map (Soils of the Mossman – Cape Tribulation area, North Queensland) were used to gain insights into the regional geology and soil characteristics.

The regional area is believed to be part of the Hodgkinson Province, characterized by the Hodgkinson Formation, which is composed of rocks such as dark grey mudstone, thin to thick bedded arenite beds, minor chert, and meta-basalt, potentially from the Devonian period. These rocks have experienced a complex structural deformation history involving both ductile and brittle processes.

The site is also believed to contain quaternary aged alluvial and colluvial deposits, including clay, silt, sand, and gravel, while the soil is thought to be of the Kimberly series, described as a friable non-cracking clay or clay loam soil (dermosols/ferrosol), with a red gradational or uniform texture formed on alluvial fans.

2.4.1 Acid sulfate soils

The northern part of the site, which are the lowest with elevations generally between about 18 m and 19 m AHD, is mapped in the Atlas of Australian Acid Sulfate Soils as having an extremely low probability of containing acid sulfate soils. In contrast, the southern part of the site, which has elevations broadly up to about 24 m AHD, is not included in the mapping of acid sulfate soils in Queensland Globe. This is due to the project boundary for national acid sulfate soils

mapping being clipped at 20 m AHD and the absence of finer scale mapping available in these areas. However, it is expected that the southern parts of the site would also present an extremely low probability of containing acid sulfate soils.

2.5 Groundwater

According to Queensland Globe, there are no registered water bores located on the site, but there are some in the vicinity. The nearby bores have been drilled to depths greater than 20 m below the ground level, into sub-artesian conditions. As a result, the groundwater conditions observed in these bores are considered to have limited relevance to what may be encountered at the site by the proposed development.

3 Investigation methodology

3.1 Geotechnical fieldwork

The fieldwork was completed between the 17 and 20 December 2022. The test locations were set out on-site by a geotechnical engineer from WSP using a hand-held GNSS receiver (± 5 m) in accessible areas.

Prior to commencement of the intrusive works, a specialist contractor was engaged to scan/check for buried services at the proposed test locations by non-invasive methods to assess that the area was clear of underground services.

Nine boreholes were drilled to a target depth of 8 m below ground level (BGL). The boreholes were drilled using a trailer mounted Gemco 210B drill rig operated by QDrill using a combination of solid stem auger drilling and rotary drilling. In situ testing and sampling within the boreholes included standard penetration tests (SPTs), undisturbed tube samples (U50), pocket penetrometer testing in cohesive soils on recovered samples where possible, and the collection of disturbed samples. The boreholes were loosely backfilled with the drill cuttings and capped with rapid set concrete and lightly compacted at the surface. A DCP test was completed adjacent to borehole CGF-BH003. Two boreholes (CGF-BH001 and CGF-BH002) were drilled within the borrow pit.

Six test pits were excavated to depths of 2.0 m to 2.3 m BGL, using a Kubota KX057-4 excavator operated by Heath's Excavations. The excavator used a 450 mm wide toothed bucket. The locations were stripped of topsoil materials before advancing the test pits to their target depths. In situ testing and sampling within the test pits included pocket penetrometer testing in cohesive soils in the test pit sidewalls (generally no deeper than about 1 m) or on recovered samples where possible, and the collection of disturbed/bulk disturbed samples. On completion, the test pits were backfilled in layers and tamped with the excavator's bucket and the topsoil materials respread over the test pit locations and track rolled. Dynamic cone penetrometer (DCP) testing was completed adjacent/at each of the test pit locations.

A site plan showing the test locations is presented in Appendix C. The test location coordinates, and ground levels are summarised in Table 3.1. The surface levels were interpolated from publicly available LiDAR data (± 0.5 m) after completion of the fieldwork. It is important to note that the LiDAR data was captured in 2009 in which progressive excavation has continued of the borrow pit. As such, the elevations of the locations within the borrow pit (i.e., CGF-BH001 and CGF-BH002) have been approximated based on the surrounding ground elevations and observation of the cut heights within the borrow pit at the time of the investigation.

The fieldwork was supervised by a geotechnical engineer from WSP who directed the subcontractors, logged the materials encountered, collected samples, and undertook in situ testing. The fieldwork was also overseen by local Traditional Owners who inspected recovered materials for potential evidence of items of historical or cultural significance. The investigation reports with photos and explanatory notes are provided in Appendix D.

The investigation reports have been prepared in general accordance with the relevant Australian Standards explicitly AS 1726-2017 and considers the results of the laboratory testing undertaken.

Table 3.1 Summary of investigation locations

Location ID	Coordinates (MGA2020, Zone 55)		Ground level (m AHD)	Termination depth (m BGL)	Completion date
	Easting (m)	Northing (m)			
CGF-BH001	332765	8204779	21.9	8.0	19/12/2022
CGF-BH002	332770	8204797	22.0	8.0	18/12/2022
CGF-BH003	332782	8204791	22.8	8.0	19/12/2022
CGF-BH004	332796	8204810	22.0	8.0	19/12/2022
CGF-BH005	332816	8204820	21.6	8.0	18/12/2022

Location ID	Coordinates (MGA2020, Zone 55)		Ground level (m AHD)	Termination depth (m BGL)	Completion date
	Easting (m)	Northing (m)			
CGF-BH006	332801	8204822	21.7	8.0	18/12/2022
CGF-BH007	332791	8204829	21.5	8.0	17/12/2022
CGF-BH008	332806	8204836	21.1	8.0	17/12/2022
CGF-BH009	332795	8204837	21.2	8.0	17/12/2022
CGF-TP003	332775	8204813	22.0	2.3	20/12/2022
CGF-TP004	332826	8204813	21.7	2.1	20/12/2022
CGF-TP006	332863	8204845	20.6	2.0	20/12/2022
CGF-TP007	332891	8204884	19.7	2.3	20/12/2022
CGF-TP008	332947	8204886	19.0	2.2	20/12/2022
CGF-TP009	332996	8204896	19.5	2.1	20/12/2022

3.2 Laboratory testing

Geotechnical laboratory testing was carried out on selected samples recovered during the fieldwork. The geotechnical laboratory testing was undertaken by WSP in Melbourne and Construction Sciences and SGS in Cairns; whom are NATA accredited laboratories. The following laboratory tests (including the Australian Standard reference where relevant) were undertaken:

- Moisture content – AS 1289.2.1.1 – 13 samples
- Liquid limit – AS 1289.3.1.2 – 13 samples
- Plastic limit – AS 1289.3.2.1 – 13 samples
- Linear shrinkage – AS 1289.3.4.1 – 13 samples
- Particle size distribution by sieving – AS 1289.3.6.1 – 13 samples
- Emerson class number – AS 1289.3.8.1 – 4 samples
- Aggressivity testing (pH, sulfate, chloride, EC) – 4 soil samples
- Dry density/moisture relationship using standard compactive effort – AS 1289.5.2.1 – 4 samples
- California bearing ratio (CBR) [4-day soak, 95% SMDD] – AS 1289.6.1.1 – 4 samples

The laboratory test results are summarised in Table 4.3 to Table 4.5 and the laboratory test reports are provided in Appendix E.

4 Investigation results

4.1 Surface conditions

The site primarily comprises of tall, dense grass and scattered trees. The site slopes gently down to the north, with a maximum incline of less than 5 degrees, but also features localized elevations and depressions that are usually less than 0.5 m in height. The western boundary is defined by Buchanan Creek, which boasts steep banks and flowing water with the height of the banks estimated to be greater than 5 m. An incised gully located in the northeast of the proposed road alignment flows northward and is generally less than 2 m deep with steep to vertical sidewalls composed mainly of hard clay. Despite recent rainfall, the site remained accessible by four-wheel drive vehicles due to the matting effect of the dense grass. However, areas that were subjected to repeated traffic started to show signs of degradation, becoming slippery and boggy in some instances.

The southwestern part of the planned CGF facility is occupied by a large borrow pit measuring at least 2000 m² and reaching depths of up to 2 m. The sidewalls are primarily vertical with a few sloped sections used as access ramps. Stockpiles of possibly previously excavated materials are present in some areas surrounding the borrow pit. The borrow pit's sidewalls composed mainly of clay, with varying amounts of gravels and cobbles in lens form. Some areas of the borrow pits' base was covered by grass while others areas were bare. Pounded water was observed in certain depressions due to recent rainfall, and the ground surface mainly composed of clay, gravel, and cobbles. Despite the rain, the borrow pit was still accessible by truck and trailer, with no significant rutting observed in the base.

Photos of the site's surface conditions at the time of the investigation can be found in Photo 4.2 to Photo 4.5.



Photo 4.1 General configuration of the site looking north (provided by Volt)



Photo 4.2 Looking south over borrow pit

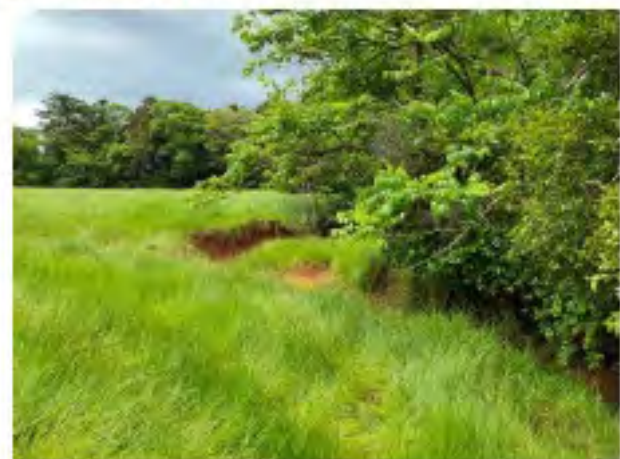


Photo 4.3 Looking north-west over gully

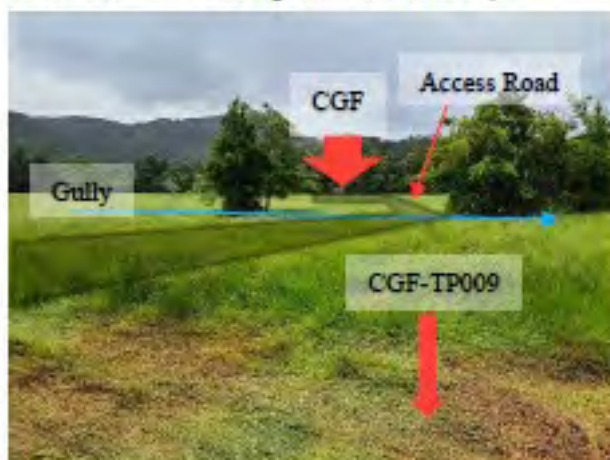


Photo 4.4 Looking south-west from CGF-TP009



Photo 4.5 Looking north-east from CGF-TP004

4.2 Subsurface conditions

Detailed descriptions of the subsurface conditions encountered are provided in the investigation reports with photos and explanatory notes presented in Appendix D. The information provided in the investigation reports are based on observations recorded at the time of the investigation, results of in situ testing, description of recovered soil samples, and laboratory test results.

A summary of the subsurface units encountered during the geotechnical investigation is provided in Table 4.1, with the depth each unit was encountered within the test locations presented in Table 4.2.

The subsurface conditions generally consisted predominantly of clay with variable amounts of sand and gravel. Gravel and cobbly layers were also encountered within some of the boreholes predominantly in the upper and lower portions of the boreholes.

Table 4.1 Summary of subsurface units

Subsurface unit	Origin	Material	Consistency/density	Description
T	Topsoil	Cohesive	Firm	low plasticity; brown to dark brown; with/trace sand; trace gravel; with roots and root fibres; moist, near plastic limit; 0.15 m to 0.20 m thick
A	Alluvial	Cohesive	Stiff	low to high plasticity; red-brown to brown; with/trace sand; trace/with gravel; occasionally trace roots and root fibres; moist, dry of plastic limit occasionally near plastic limit
B			Very stiff	low to high plasticity; red-brown to brown-red; with/trace sand; trace gravel; moist, dry of plastic limit
C			Hard	medium to high plasticity; red-brown to brown, generally mottled pale brown and pale grey; trace sand; trace gravel; moist, dry of plastic limit
Y	Alluvial possibly colluvial	Cohesive/Granular	Stiff to hard	low to high plasticity; brown to red-brown occasionally mottled pale brown when found deep in the profile; gravelly, fine to coarse grained, rounded to angular gravel; with/trace cobbles; sandy/with/trace sand; moist, dry of plastic limit; up to 1.5 m thick
Z	Alluvial	Granular	Dense	fine to coarse grained, rounded to sub-rounded; brown-red; sandy/with sand; silty low to high plasticity; moist; up to 2.2 m thick

4.2.1 Groundwater conditions

During the geotechnical investigation, groundwater was not encountered within any of the test pits or within borehole CGF-BH009. Borehole CGF-BH009 was drilled completely using solid flight augers, so as not to introduce any water into the borehole. All the other boreholes were drilled using wash bore drilling and as such groundwater was not assessed due to the introduction of water into the borehole. Borehole CGF-BH009 was left open for over 24 hours, and over this period the borehole remained dry. It should be noted that groundwater levels may fluctuate subject to seasonal conditions.

Table 4.2 Summary of subsurface conditions encountered within the test locations

Subsurface unit	Depth range of subsurface units encountered within the test locations (m BGL)														
	CGF-BH001	CGF-BH002	CGF-BH003	CGF-BH004	CGF-BH005	CGF-BH006	CGF-BH007	CGF-BH008	CGF-BH009	CGF-TP003	CGF-TP004	CGF-TP006	CGF-TP007	CGF-TP008	CGF-TP009
T	NA	NA	NA	NA	NA	NA	0.0-0.2	NA	NA	0.0-0.2	0.0-0.2	0.0-0.2	0.0-0.2	0.0-0.2	0.0-0.2
A	0.0-3.0	0.5-3.0	0.7-6.0	0.0-1.0 1.7-4.5	1.5-3.1	0.0-3.0	0.2-3.0	0.0-3.0	0.0-4.5	0.2-0.5	0.2-0.5	0.2-0.5	NE	0.2-0.7	0.2-0.6
B	3.0-4.3	3.0-4.5	NE	4.5-6.0	3.1-4.5	3.0-4.5	3.0-5.8	3.0-4.8	4.5-6.6	0.5-0.8	NE	0.5-0.8	0.2-0.5	0.7-1.3	0.6-2.1 ⁽¹⁾
C	4.3-7.3	4.5-7.5	6.0-8.0 ⁽¹⁾	6.0-8.0 ⁽¹⁾	4.5-6.3 7.0-8.0 ⁽¹⁾	4.5-6.0 7.5-8.0 ⁽¹⁾	NE	4.8-7.0 7.5-8.0 ⁽¹⁾	NE	0.8-2.3 ⁽¹⁾	1.2-2.1 ⁽¹⁾	0.8-2.0 ⁽¹⁾	0.5-2.3 ⁽¹⁾	1.3-2.2 ⁽¹⁾	NE
Y	7.3-8.0 ⁽¹⁾	0.0-0.5 7.5-8.0 ⁽¹⁾	0.0-0.7	1.0-1.7	0.0-1.5 6.3-7.0	6.0-7.5	NE	7.0-7.5	6.6-8.0 ⁽¹⁾	NE	0.5-0.7	NE	NE	NE	NE
Z	NE	NE	NE	NE	NE	NE	5.8-8.0 ⁽¹⁾	NE	NE	NE	0.7-1.2	NE	NE	NE	NE

(1) Termination depth of test location.

(2) NE = not encountered, NA = not assessed

4.3 Laboratory test results

Table 4.3 Summary of soil classification laboratory test results

Location ID	Sample depth (m BGL)	Moisture content (%)	Atterberg limits (%)			Linear shrinkage (%)	Particle size distribution (%)			Weighted plasticity index (WPI) ⁽¹⁾	Emerson class number
			Liquid limit	Plastic Limit	Plasticity index		Gravel	Sand	Fines		
CGF-BH001	1.50-1.95	40.4	64	31	33	15.0	1	19	80	2927	-
CGF-BH002	4.50-4.95	35.6	74	39	35	13.5 ⁽²⁾	0	6	94	3427	-
CGF-BH003	1.50-1.95	37.8	66	33	33	17.5 ⁽²⁾	0	11	89	3201	-
CGF-BH004	0.50-0.95	26.8	57	32	25	15.0 ⁽²⁾	10	19	71	2375	-
CGF-BH005	4.50-4.95	27.6	69	35	34	14.0	3	10	87	3179	-
CGF-BH006	7.50-7.95	26.4	64	29	35	14.0	5	21	74	3063	-
CGF-BH007	6.00-6.45	25.4	53	35	18	9.0	32	34	34	842	-
CGF-BH008	1.50-1.95	31.8	58	32	26	14.5 ⁽²⁾	6	20	74	2077	-
CGF-BH009	3.00-3.45	28.5	64	35	29	15.0 ⁽²⁾	2	15	83	2598	-
CGF-TP003	0.50-0.60	35.3	68	38	30	14.0 ⁽²⁾	0	20	80	2850	4
CGF-TP004	0.50-0.60	28.8	56	34	22	11.0 ⁽²⁾	44	16	40	1039	4
CGF-TP007	0.40-0.50	38.8	74	43	31	15.0 ⁽²⁾	0	5	95	3057	4
CGF-TP009	0.50-0.60	24.3	46	26	20	11.5 ⁽²⁾	0	11	89	1962	4

(1) WPI = plasticity index × percentage passing the 0.425 mm sieve (Test Method Q252-2019)

(2) Cracking defects were observed during the linear shrinkage test

Table 4.4 Summary of soil chemical laboratory test results

Location ID	Sample depth (m BGL)	Sulfates [expressed as SO ₄] (ppm)	pH (pH unit)	Chlorides [Cl] (ppm)	Resistivity (ohm·cm)	Soil conditions	Exposure classification	
							Concrete	Steel
CGF-BH001	6.00-6.45	3	5.9	<5 ⁽¹⁾	78000	B ⁽²⁾	Non-aggressive/A1	Non-aggressive
CGF-BH007	0.50-0.95	<3 ⁽¹⁾	5.9	<5 ⁽¹⁾	81000	B ⁽²⁾	Non-aggressive/A1	Non-aggressive
CGF-BH008	4.50-4.95	<3 ⁽¹⁾	5.6	<5 ⁽¹⁾	79000	B ⁽²⁾	Non-aggressive/A1	Non-aggressive
CGF-BH009	1.50-1.95	<3 ⁽¹⁾	5.5	<5 ⁽¹⁾	73000	B ⁽²⁾	Mild/A2	Non-aggressive

(1) Limit of reporting.

(2) Soil conditions A = high permeability soils (e.g., sands and gravels) which are in groundwater. Soil conditions B = low permeability soils (e.g., silts and clays) or all soils above groundwater. The exposure classifications provided for concrete have been determined from Table 6.4.2(C)/Table 4.8.1 of the Australian Standards AS 2159/AS 3600 respectively. The exposure classification provided for steel have been determined from Table 6.5.2(C) of the Australian Standard AS 2159.

Table 4.5 Summary of soil compaction and strength laboratory test results

Location ID	Sample depth (m BGL)	Moisture content (%)	WPI	Maximum dry density ⁽¹⁾ (t/m ³)	Optimum moisture content ⁽¹⁾ (%)	Laboratory density ratio ⁽¹⁾ (%)	Laboratory moisture ratio ⁽¹⁾ (%)	Soaked CBR ⁽²⁾ (%)	CBR swell (%)	Moisture content after soaking ⁽²⁾ (%)	Dry density after soaking ⁽²⁾ (t/m ³)
CGF-TP003	0.50-0.60	35.3	2850	1.41	33.0	95.0	100.5	8	0.5	35.7	1.33
CGF-TP004	0.50-0.60	28.8	1039	1.64	22.5	94.5	101.5	14	0.5	25.5	1.55
CGF-TP007	0.40-0.50	38.8	3057	1.31	36.5	95.5	99.0	9	0.5	39.4	1.24
CGF-TP009	0.50-0.60	24.3	1962	1.64	21.5	95.0	99.0	4.5	0.0	25.6	1.56

(1) All compactions were undertaken using standard compactive effort with a 4.5 kg surcharge.

(2) All CBR samples were soaked for four days.

5 Geotechnical assessment

5.1 General

This section of the report provides recommendations and comments regarding earthworks, foundations, and pavements for the proposed development at the site. The information provided within this report has been based on project specific information known to WSP at the time of preparing this report.

5.1.1 Key geotechnical conditions

The site comprised mostly of stiff to hard alluvial cohesive soils. A layer of granular material was observed within test pit CGF-TP004 and borehole CGF-BH007 and it is anticipated that the ground may contain sporadic lenses of gravel with possible cobbles.

The top 0.2 m at most locations comprised of topsoil which contained notable amounts of root fibres and was dark in colour.

From comparison of the SPT results with pocket penetrometer results and tactile assessment, the SPT results appear to generally underestimate the consistency of the soil based on commonly used published correlations between the SPT N value and undrained shear strength. As such, SPT N values should be used with caution when estimating geotechnical properties directly.

Groundwater was not encountered within any of the test pits (max depth 2.3 m) or within borehole CGF-BH009. All the other boreholes were drilled using wash bore drilling and as such groundwater was not assessed due to the introduction of water into the borehole.

The south-western portion of the proposed development is currently occupied by a borrow pit which may be up to 2 m deep in areas.

The natural cohesive materials may or may not be expansive as current laboratory testing is conflicting.

The soils present on-site are unlikely to be dispersive.

Most of the soils present on-site were cohesive and may be of low permeability and that the site may have poor natural drainage, in particular in the borrow pit which currently acts as a detention basin.

5.1.2 Potential geotechnical risks

From the investigation it is anticipated that potential geotechnical risks to the proposed development could include:

- Differential settlement between the fill to be placed within the borrow pit and the surrounding natural ground.
- Variable ground conditions could be encountered while drilling bored piles including possible dense granular layers that could contain gravels and cobbles which may be difficult to drill.
- Potential degradation in trafficability of the natural cohesive materials when wet.
- Potential variation of the expansive nature of the natural cohesive materials.

5.1.3 General geotechnical parameters

General geotechnical parameters are provided in Table 5.1 which can be used for design purposes. Actual subsurface conditions exposed during construction must be verified by a suitably qualified geotechnical engineer to confirm that the conditions are consistent with those on which the design advice is based.

Table 5.1 Summary of general geotechnical parameters

Subsurface unit	Soil type	Consistency/density	Bulk unit weight, γ (kN/m ³)	Undrained shear strength, s_u (kPa)	Effective cohesion, c' (kPa)	Effective friction angle, ϕ' (°)	Young's modulus, E (MPa) ⁽¹⁾	Poisson's ratio, ν' [ν_u]
T	Cohesive	Firm	18.0	-	-	-	-	-
A	Cohesive	Stiff	19.0	60	2	28	12	0.30 [0.50]
B	Cohesive	Very stiff	19.5	100	3	28	15	0.20 [0.50]
C	Cohesive	Hard	20.0	250	4	29	20	0.20 [0.50]
Y	Cohesive/ Granular	Stiff/dense	19.0	60	0	31	12	0.30 [0.40]
Z	Granular	Dense	21.0	-	0	36	50	0.30

(1) The values provided for Young's modulus shall only be used for foundations. For example, values of similar materials used in trench construction may be significantly less than the above values.

5.2 Foundation recommendations

5.2.1 Site classification (AS 2870)

Per AS 2870-2011, a site classification of Class M may be adopted for the site under normal moisture conditions. A M class site corresponds to a moderately reactive site, which may experience moderate ground movement from moisture changes. The site classification provided has been based on the characteristic surface movement (y_s) estimated in accordance with Clause 2.3 and classified in accordance with the limits provided in Table 2.3 of AS 2870-2011. The estimated characteristic surface movements were calculated to be less than 40 mm based on our experience with similar materials and the laboratory CBR swell results. Two undisturbed tube samples were submitted for laboratory soil reactivity testing but following extraction were deemed unsuitable for shrink-swell index testing.

It should be noted that the use of standard footings in accordance with AS 2870 is only applicable for buildings having loadings and construction styles like that of a residential dwelling.

The site classification provided is based on shallow footings (such as those provided in the preliminary design drawings) being founded in the site's natural soils without significant site earthworks being undertaken. If filling or cutting of the site is to be undertaken as part of the proposed development the provided site classification may need to be recalculated accordingly once site levels, excavation depths, removal of significant vegetation/trees, and imported fill properties, if proposed, are known.

The engineered fill required to backfill the borrow pit, or if any engineered fill is required for the site to raise surface levels, we recommend that new fill should comprise of imported granular structural fill of low reactivity (refer to Section 5.5.3). The naturally occurring high plasticity site soils, may also be used in selective locations under strict moisture and density control in accordance with Section 5.5.3.

Given the potential reactivity and possibility of softening the natural soils (although not indicated by soaked CBR tests), it is recommended that the foundation soil be protected from becoming extremely wet by adequate attention to site drainage and prompt repair of plumbing leaks.

The estimated characteristic surface movements provided is for potential reactive soil movements only – any ground surface movements (settlement) from structural loads will also need to be considered in design.

5.2.2 Exposure classification for steel and concrete (AS 2159/AS 3600)

Based upon the results provided in Table 4.4, the following exposure classifications may be adopted:

- For concrete piles (in accordance with AS 2159-2009) – Non-aggressive to mild
- For steel piles (in accordance with AS 2159-2009) – Non-aggressive
- For shallow concrete foundations (in accordance with AS 3600-2018) – A1 to A2

The assumed soils conditions are provided in Table 4.4.

5.2.3 Earthquake site sub-soil class (AS 1170.4)

Based on the subsurface conditions encountered at the test locations, it is considered that the seismic site-specific sub-soil class, Ce “shallow soil site” can be adopted for this site in accordance with AS 1170.4-2007.

Figure 3.2(F) of AS 1170.4-2007, indicates that the hazard factor (Z) for the site may be in the order of 0.09.

5.2.4 Shallow foundations

Potential shallow footing systems

From the provided preliminary design drawings it is understood that the proposed shallow footings will consist of primarily strip footings and slabs on ground. Based on subsurface conditions encountered it is considered that most footing systems would be appropriate such as pad footings, strip footings, and rafts subject to the magnitude of forces they are required to resist and with consideration to the Site Classification presented in Section 5.2.1. The recommendations provided in the following sections are based on:

- All footings being founded in natural alluvial soils with a consistency/density of at least stiff (undrained shear strength >60 kPa)/dense (relative density >65%) or be founded in engineered select fill compacted in accordance with Section 5.5.3 and the recommendations provided below.
- All footings to be founded in soils of similar stiffness. Footings should not span material transitions (e.g., the contact between fill and natural soils) unless the potential for differential settlement is considered in the design of the structure.
- Footing excavations are dry and free of loose, softened, and disturbed materials at the time of pouring concrete.
- Footing excavations are free of unsuitable materials.

Unsuitable materials encountered in footing excavations are to be removed and replaced with lean mix concrete grout.

We recommend that footing excavations be inspected by an experienced geotechnical engineer during construction to confirm that the foundation conditions are consistent with those on which the design recommendations are based.

5.2.4.1 Allowable bearing pressures

For the footings provided in the preliminary design drawings founded at the depths indicated and formed into natural soils or engineered fill could be designed based on the following allowable bearing pressures:

- 80 kPa for the 0.4 m wide and 0.2 m deep tank ring beam strip footing
- 120 kPa for the 0.5 m wide, 3.0 m long, and 0.5 m deep container pad footings

The above allowable bearing pressures are based on the loads being vertical and concentric, founded on a level base, with flat surrounding ground, and with no groundwater within the influence zone of the footing. If the footings are to be sloped, subject to inclined loads, eccentricity, moments, or influenced by groundwater the provided allowable bearing pressures will have to be decreased accordingly by WSP.

For the preliminary design and proportioning of other shallow footings not provided within the preliminary design drawings an indicative allowable bearing pressure of 100 kPa may be adopted provided the foundation does not exceed 1 m in width and that it is subject primarily to permanent loading. Higher allowable bearing pressures may be able to be adopted subject to submission of preliminary footing designs and loadings to WSP for further analysis.

5.2.4.2 Settlement of shallow foundations

For the allowable bearing pressures provided in Section 5.2.4.1 for individual footings, it is estimated that the initial settlements will be in the order of 1% of the least footing dimension.

Settlements of raft foundations such as that may be constructed for the water tank will depend on the thickness and stiffness of the raft, as well as the size and load across the slab. As such a settlement analysis of the proposed tank should be undertaken during detailed design.

To assist with preliminary design a vertical modulus of subgrade reaction of 2.3 MN/m³ is suggested for the tanks foundation.

5.2.5 Piled foundations

5.2.5.1 Potential pile types and installation

Based on the information provided by Volt, it is understood that bored piles are proposed to support the LV and HV switch rooms. Based on the materials encountered during the investigation, it is expected that predominantly cohesive soils will be encountered with the possibility of encountering some granular layers over the expected piling depths including cobbles.

During boring of the piles, if cobbles are encountered, they could present difficulties during boring also with minor unravelling of the shaft; although these issues were not encountered while drilling the geotechnical boreholes. It is also deemed that the potential for caving is considered unlikely, and hence the need for temporary or permanent casing is also unlikely. Groundwater was not encountered during the fieldwork in any of the test pits to a maximum depth of 2.3 m depth and in borehole CGF-BH009 to a depth of 8 m, but groundwater levels may fluctuate seasonally and be present during heavy rainfall periods and that the groundwater was not able to be assessed for the other eight boreholes due to the boreholes being drilled using wash boring which introduces drilling water into the borehole to facilitate drilling.

It is recommended that the piling contractor makes an assessment that their proposed methodology and piling equipment will be able to penetrate these materials and is suitable.

Actual subsurface conditions encountered during construction must be verified by a suitably qualified geotechnical engineer from WSP to confirm that the exposed conditions are consistent with those on which the design is based.

5.2.5.2 Preliminary piling parameters

Bored piles shall be designed in accordance with AS 2159-2009 provided the pile is embedded into the ground by at least six pile diameters.

Geotechnical design parameters for the design of bored piles using static analyses are provided in Table 5.2. Static calculations using the parameters provided will provide a preliminary guide to size and length; however, the capacity of the piles should be confirmed at the time of installation and achievement of the design loads should be made the responsibility of the piling contractor.

Table 5.2 Design parameters for bored (cast in situ) concrete piles

Subsurface unit	Ultimate skin friction, f_{tks} (kPa) in compression	Ultimate base resistance, f_b (kPa)
T	-	-
A	25	540

Subsurface unit	Ultimate skin friction, $f_{m,s}$ (kPa) in compression	Ultimate base resistance, f_b (kPa)
B	45	900
C	110	2250
Y	25	540
Z	15	1900

- (1) Skin friction should be ignored within the upper 0.5 m of the pile shaft to allow for potential disturbances during construction, general site earthworks, and soil shrinkage cracking.
- (2) Bored piles are required to be installed to 1.5 times the diameter of the pile into the founding layer.
- (3) To adopt the base resistances provided, the adopted material needs to extend below the pile toe by at least 3.0 times the diameter of the pile.
- (4) The spacing of piles centre-to-centre shall not be less than 2.5 times the diameter of the pile.
- (5) For uplift (tension) loads, shaft adhesion values corresponding to 75% of the average shaft adhesion values compression may be used for tension capacity design.

5.2.5.3 Geotechnical strength reduction factor (AS 2159-2009)

The ultimate geotechnical capacities ($R_{d,up}$) obtained from the parameters provided in Table 5.2 must be multiplied by an appropriate geotechnical strength reduction factor (ϕ_g) in accordance with Section 4 of AS 2159-2009 to calculate a design geotechnical strength ($R_{d,g}$).

A basic geotechnical strength reduction factor (ϕ_{gb}) of 0.56 corresponding to an overall risk category of moderate for high redundancy systems is suggested based on the site conditions and the nature of the development known at the time of writing this report. This value is based on the assessed Average Risk Rating (ARR) of 3.3 using the methods given in Clause 4.3.2 of AS 2159-2009 including the Individual Risk Ratings (IRR_i) summarised in Table 5.3.

Table 5.3 Selected Individual Risk Ratings (IRR_i) and weighting factors (w_i) for risk factors

Risk factor	w _i	IRR _i	Typical description of risk circumstances for IRR		
			1 (Very low risk)	3 (Moderate)	5 (Very high risk)
Site					
Geological complexity	2	2	Horizontal well-defined strata	Variability but no abrupt changes	Highly variable
Extent of investigation	2	2	Extensive	Some bores > pile toe	Limited, shallow
Amount and quality of data	2	5	Lots on strength and compressibility	CPT/bores over full depth	Limited SPTs/index
Design					
Experience with similar conditions	1	2	Extensive	Limited	None
Method of assessment	2	5	Lab or in situ tests or pile load test	Site specific correlations	Non-site specific SPTs
Design method	1	3	Well established and sound methods	Simplified methods	Simple empirical
Method of utilising results testing and install data	2	1	Design on min values	Design on average values	Design on max values

Risk factor	w _i	IRR _i	Typical description of risk circumstances for IRR		
			1 (Very low risk)	3 (Moderate)	5 (Very high risk)
Installation					
Level of construction control	2	5	Detailed professional geotechnical supervision	Limited professional geotechnical supervision	Limited supervision
Level of performance monitoring	0.5	5	Detailed monitoring of movement	Correlation of installed parameters	No monitoring

Pile testing to verify geotechnical strength and shaft integrity is encouraged, and testing benefit factors can be incorporated to allow the use of higher geotechnical strength reduction factors for such testing. If the design ultimate geotechnical strength ($R_{d,ult}$) is not verified by pile testing, the basic geotechnical strength reduction factor, equal to 0.56, shall be adopted in design.

Where the basic geotechnical reduction factor is greater than 0.4 and is adopted in the design, the following required testing is to be undertaken as a minimum:

- In the absence of tests to verify design ultimate geotechnical strength, testing shall be performed to verify pile serviceability. The relevant acceptance criteria nominated shall apply. A minimum rate of 2% of piles are to be tested for serviceability based on a ARR of 3.3. Assuming that less than 50 piles will be installed across the site testing of one pile would satisfy this condition.
- Testing shall be performed to verify the integrity of pile shafts. Assessment of pile shaft integrity may be by high-strain dynamic pile testing or other methods of integrity testing.
- The designer shall select a percentage of between 5-25% of pile shafts to be tested for integrity taking into consideration the degree of installation monitoring to be carried out, and the ratio of design action effect to the factored structural strength of the pile shaft.

If the minimum required testing to verify pile serviceability listed above is not undertaken a value of no greater than 0.40 may be adopted for the basic geotechnical strength reduction factor (ϕ_{gb}).

5.2.5.4 Settlement of piled foundations

Individual and pile group settlements should be assessed once the loads, founding depths, and pile layouts are finalised. It is recommended that pile working loads be supported by shaft resistance to limit individual pile settlements. If base resistance is required to resist the applied loads, settlements may increase depending on founding material, magnitude of the applied load, and the pile size adopted.

5.3 Pavement recommendations

5.3.1 Preliminary subgrade design parameters

The DCP testing indicated in situ CBR values of between 1.7% and 25.6% based on correlations provided by Austroads (Guide to Pavement Technology Part 5: Pavement Evaluation and Treatment Design, 2019). The laboratory testing indicated soaked CBR values for the natural soils range from 4.5% to 14% (refer to Table 4.5 in Section 4.3). Following site preparation and earthworks as outlined below, we consider that a natural subgrade CBR value of 3% could be adopted for preliminary pavement design. Further CBR testing should be carried out following subgrade preparation to confirm or modify design CBR values once pavement areas are finalised. CBR values for pavements to be formed on imported fill materials will depend on the characteristic properties of the imported fill. As such, pavement designers shall adopt a CBR value suitable for the imported fill.

The laboratory testing indicated liquid limit values for the natural soils ranged from 46% to 74%, and weight plasticity index values ranged from 1039 to 3057 (refer to Table 4.3 and Table 4.5 in Section 4.3). Based on the guide to classification of expansive soils provided by Austroads (Guide to Pavement Technology Part 2: Pavement Structural Design, 2017) the results mentioned above indicate that the natural soils may be highly expansive in nature.

Retrospectively, the laboratory testing also indicated CBR swell values for the natural soils ranged from 0.0% to 0.5%, and plasticity index values ranged from 20% to 31%. Based on the Austroads guide these results would indicate that the natural soils may be low to moderately expansive in nature. As such, there is uncertainty on whether the natural subgrade materials may or may not be highly expansive in nature. Further laboratory may be beneficial in determining the expansive nature of the natural materials.

If the material is expansive, the level of movement is normally dependent upon the selected pavement design. If a suitable pavement design is selected this may be able to restrict movements. Some strategies that the pavement designer may want to adopt to minimise volume change and moisture variation in the subgrade include:

- Provide a low-permeability lower subbase or a select fill capping layer above natural materials. The capping layer should extend past the edge of pavement, and if provided, past the kerb and channel, to reduce edge movement.
- Provide – through appropriate design of the cross-section of the road – sealed shoulders and impermeable verge material.
- Possibly introduce lime or cement to the subgrade to provide stabilisation to the natural materials.

5.3.2 Pavement subgrade preparation

All clearing and grubbing works shall be in accordance with Section 5.5.1.

All topsoil operations associated with roadworks construction shall be in accordance with Section 5.5.1.

All earthworks' operations up to subgrade level shall comply with the requirements within Sections 5.5.1 and 5.5.3.

The subgrade material (defined as the top 300 mm of earthworks profiled and compacted upon which pavement materials are to be placed) shall comprise of engineered fill or natural soils. The subgrade material shall be compacted to provide a relative compaction for a standard compactive effort as follows also included in Section 5.5.1:

- Minimum dry density ratio (cohesive soils) – 97%
- Minimum dry density index (cohesionless soils) – 80%

Based upon the laboratory results the natural subgrade materials are wet of their optimum moisture contents and may need to be dried before they are compacted. It should be noted that soil moisture contents may fluctuate subject to seasonal conditions.

The testing frequency of the subgrade should not be less than one test per 1000 m² with a minimum number of three tests per sample area being tested. At least one sample area shall also be tested for each type of subgrade material evident on-site. All testing shall be undertaken by a Geotechnical Testing Authority (GTA) in accordance with AS 3798.

The subgrade material shall not include any unsuitable material as defined in Main Roads Standard Specification MRTS 04 "General Earthworks" which includes topsoil, root effected, and softened materials.

Where unsuitable material is encountered in the subgrade or the natural subgrade materials are unable to be compacted to the levels provided above a suitable subgrade replacement material shall be incorporated in the works. Subgrade replacement material may comprise of either earth fill materials of Class B, C, or D (in accordance with MRTS04) or an unbound granular material of Type 2.5 (in accordance with MRTS05) with the minimum 4-day soaked laboratory CBR values of 3% and 15% respectively tested at 95% standard compaction and optimum moisture content. The subgrade replacement material is to be placed in uniform layers not exceeding 200 mm loose thickness and compacted in accordance with the compaction level provided above. The compaction requirements and testing frequency noted above shall apply to all operations involving any subgrade replacement material required for the works.

Following completion of subgrade compaction, trimming, and satisfactory density testing, the whole of the subgrade area shall be inspected by proof rolling with a fully loaded single rear axle truck with a minimum axle loading of 8 tonne (or acceptable equivalent) with tyres inflated to 550 kPa. Acceptable proof rolling shall be taken to be no visible signs of deformation or instability in the subgrade. If proof rolling reveals any soft or loose materials these shall be deemed as unsuitable material and removed and replaced as mentioned above and represented for test-rolling. Where unstable areas exceed 20% of the area being considered by test-rolling, the whole of the area should be ripped, recompacted, and represented for test rolling.

Sufficient protection should be provided to reduce the amount of water which can permeate into the subgrade such as effective surface and subsurface drainage.

5.4 Permanent batter slope recommendations

Permanent batters constructed in the natural soils present on site are to be no steeper than 1V:2H to a maximum vertical height of 2 m.

Permanent batters constructed with engineered fill can be formed at 1V:1.5H to a maximum vertical height of 2 m, however flatter batter slopes are recommended. Any permanent batter slopes constructed with engineered fill should be formed by over filling by at least 1 m and cutting back to the design profiles.

All batters should be protected from erosion by vegetation or by more permanent measures such as concrete, rock pitching or geosynthetics in critical areas.

As the proposed development is generally at least 30 m from the creek banks of Buchanan Creek, slope stability is currently not considered a risk to the development. Should the development encroach closer to the creek's banks, slope stability may need to be assessed and considered within any designs.

5.5 Construction considerations

5.5.1 Site preparation of fill and pavement areas

The site should be cleared and grubbed of all trees, stumps, and other materials unsuitable for incorporation in the works.

The extent of clearing and grubbing shall be taken to mean the removal and disposal of:

- Trees, shrubs, and overhanging branches, both living and dead
- Tree stumps and roots to a depth not less than 300 mm BGL
- Rocks, rubbish, and other artificial obstructions from the ground surface
- Abandoned services to a depth not less than 300 mm BGL
- Old foundation, buildings, and structures
- Minor made structures (such as fences)
- Other materials, which are unsuitable for use in the works.

Unless otherwise specified or directed, the area to be cleared and stripped is the minimum width required to construct the works plus a margin of 2 m beyond tops of cuts and toes of embankments.

Areas which are to be filled, excavated, or structures built on are to be stripped of all vegetation and of such soils that may be unsuitable to support the proposed loadings or for incorporation in fills subject to density, moisture, or other specified controls. Topsoil and severely root-affected soils will need to be stripped as unsuitable material or as required for subsequent revegetation. Based on the near surface materials encountered during the investigation a stripping depth of at least 200 mm is likely required.

Removal of topsoil shall only commence after erosion and sedimentation controls have been implemented and when clearing, grubbing, and disposal of materials have been completed on that section of the works.

Topsoil throughout the extent of the work shall be removed and stockpiled separately clear of the work with care taken to avoid contamination by other materials.

Topsoil material stripped from the site shall be stockpiled for later use in re-spreading over areas to be revegetated.

To minimise erosion, stockpiles are to be protected by effective usage of erosion and sediment control devices, which are to be defined within an Erosion and Sediment Control Management Plan.

The ground surface exposed after stripping should be scarified to a depth of at least 150 mm, moisture conditioned, and compacted with a sheepsfoot roller to the minimum relative compaction values given below:

- Structural fill areas to support structural loadings
 - Minimum dry density ratio (cohesive soils) — 98%
 - Minimum dry density index (cohesionless soils) — 75%
- Non-structural fill areas
 - Areas to support pavements within 300 mm of subgrade level
 - Minimum dry density ratio (cohesive soils) — 97%
 - Minimum dry density index (cohesionless soils) — 80%
 - Areas to support general fill or pavements greater than 300 mm from subgrade
 - Minimum dry density ratio (cohesive soils) — 95%
 - Minimum dry density index (cohesionless soils) — 70%

The exposed ground after stripping and compaction shall be inspected by proof rolling with a fully loaded single rear axle truck with a minimum axle loading of 8 tonne (or acceptable equivalent) with tyres inflated to 550 kPa. Acceptable proof rolling shall be taken to be no visible signs of deformation or springing in the compacted surface. If proof rolling reveals deformation or springing or any soft or loose materials these shall be deemed as unsuitable materials. Where unstable areas exceed 20% of the area being considered by test-rolling, the whole of the area should be ripped, recompacted, and represented for test rolling. Within fill areas, unsuitable materials should be removed and replaced with engineered fill in uniform layers not exceeding 200 mm loose thickness and compacted as mentioned above.

If compaction of the exposed surface after stripping would result in a decrease in compaction, compaction should not be undertaken, and the designer should be consulted.

The depth to which scarifying is carried out should not exceed that which can be compacted.

Earthworks should be supervised by a suitably qualified person and compaction levels checked by a GTA in accordance with the Australian Standard AS 3798. Level 2 supervision as outlined in AS 3798 is recommended as a minimum unless a higher level of testing is specified or directed.

The testing frequency of the exposed surface after stripping should not be less than one test per material type per 2500 m² or 3 tests per lot, whichever requires more tests.

All testing is to be carried out by a NATA registered laboratory with appropriate accreditation and suitably qualified personnel.

5.5.2 Excavations

It is understood that excavations across the site are likely to be minimal and generally less than 1 m BFG.

When completed all culvert excavations, benches, berms, and drains shall be free draining.

Completion and backfilling are to be undertaken as soon as possible to minimise the extent of site open to the effect of the environment.

All surface water runoff should be diverted away from any proposed excavations.

5.5.2.1 Excavatability and potential reuse of excavated materials

Based on the soils encountered within the test locations, it is considered that excavations are likely to be possible with conventional small sized excavation plant such as was used in the investigation i.e., backhoes and excavators. Easy digging with conventional small sized excavation plant is expected.

The excavated materials are likely to be comparable to Class C to Class D earth fill material in accordance with Table 14.2.2 of MRTS04. As such excavated natural materials are likely to be suitable for use as general fill material to construct embankments up to 300 mm below subgrade level provided the material does not contain more than 20% by mass cobbles of between 75 mm and 150 mm and no cobbles or boulders larger than 150 mm. For the construction of embankments, the excavated materials would not be suitable for use within the top 300 mm below subgrade level and that this zone within embankments should comprise of Class A1 or Class B earth fill materials in accordance with Table 14.2.2 of MRTS04.

Provided the excavated materials are likely to consist of cohesive materials of high plasticity, which may be reactive, they need to be selectively placed as fill and under strict moisture and density control.

Excavated materials due to their possibly reactive nature should not be used under structures. If site won material is to be used as fill under structures further laboratory testing and analysis should be undertaken to understand the shrink-swell, softening, compactability, and reduced shear strength parameters due to remoulding.

5.5.2.2 Excavation stability

Confined excavations should be battered or fully supported to ensure worker safety if entry into excavations is required. Stockpiled materials or plant should be set back a minimum distance from the crest of the batter equal to the depth of the excavation.

Based on the materials encountered during the field investigation temporary construction batters (i.e., not opened for more than a few days) are to be formed at no steeper than 1V:1H up to 1.5 m high in natural materials. At the temporary slope gradients nominated above, some minor face slumping and movements behind the batter crests could occur.

Benching at an equivalent batter angle with vertical steps no steeper than 1 m high may also be used in the natural soils.

Batter stability should be confirmed by a geotechnical engineer at the time of excavation and prior to the entry of personnel.

All surface water runoff should be diverted away from any proposed excavations.

If groundwater is encountered during construction, further advice from WSP will be required.

5.5.2.3 Excavation support

Excavations exceeding the recommended guidelines in Section 5.5.2.2, or if groundwater is encountered will require ground supporting systems. Excavation wall supports may also be required where proposed open trench excavations are likely to compromise the stability of foundation materials supporting existing buried services, pavements, or structures. Parameters for the design of ground supporting systems are provided in Table 5.1 (general geotechnical parameters) and Table 5.4 (lateral earth pressure coefficients for drained conditions). Design of lateral support systems will also need to consider the presence of water pressure if encountered.

Actual subsurface conditions exposed during construction must be verified by a suitably qualified geotechnical engineer from WSP to confirm that exposed conditions are consistent with those on which the design is based. The detailed design of support systems is beyond the scope of this report.

Table 5.4 Lateral earth pressure coefficients for drained conditions

Material	Active (K_a)	Passive (K_p)	At rest (K_0)
Engineered fill	0.33	3.00	0.50
Natural cohesive materials	0.38	2.66	0.55
Natural granular materials	0.26	3.85	0.41

5.5.3 Filling

Non-structural fill could comprise of the natural soils found on-site for the construction of pavement embankments up to 300 mm below subgrade level or as a subgrade replacement material for unsuitable natural subgrade materials provided the material does not contain more than 20% by mass cobbles of between 75 mm and 150 mm and no cobbles or boulders larger than 150 mm. This material may be referred to as general fill from this point forward.

The natural materials are unlikely to be suitable as structural fill under proposed structures or as non-structural fill used for the construction of embankments within the top 300 mm below subgrade level.

Structural fill or non-structural fill used for the construction of embankments within the top 300 mm below subgrade level could comprise of imported Class A1 or Class B earth fill materials in accordance with Table 14.2.2 of MRTS04. This material may be referred to as select fill from this point forward. Imported select fill shall be relatively stable to moisture change with changes in moisture content. Suitable imported select fill materials types shall be predominantly granular materials free from organic matter and lumps of clay. Select fill should be well graded with a maximum particle size of 50 mm after compaction and containing less than 20% by mass of particles coarser than 37.5 mm after field compaction. A guide for selection of suitable select fill is that the weighted plasticity index (plasticity index times the percentage of material passing the 0.425 mm sieve) to be less than 1000.

The fill should be placed in uniform layers not exceeding 250 mm loose thickness, pre-conditioned to a moisture content $\pm 2\%$ of the optimum moisture content and compacted with at least conventional medium-sized compaction plant. Site won general fill materials and select fill should be compacted to the minimum relative compaction values given below:

- Select fill to support structural loadings
 - Minimum dry density ratio (cohesive soils) — 98%
 - Minimum dry density index (cohesionless soils) — 75%
- Select fill to support pavements within 300 mm of subgrade level
 - Minimum dry density ratio (cohesive soils) — 97%
 - Minimum dry density index (cohesionless soils) — 80%
- General fill to form embankments to support pavements greater than 300 mm from subgrade
 - Minimum dry density ratio (cohesive soils) — 95%
 - Minimum dry density index (cohesionless soils) — 70%

Where fill abuts vertical or sloping ground steeper than 1V:8H, benches should be cut into the ground. The depth of bench should be not less than 100 mm, but generally be of the order of 300 mm; however, it may vary depending on the natural slope of the ground, and the nature and proposed end-use of the fill and the equipment being used. The benches should be shaped to provide free drainage.

When completed all embankments/fill areas shall be free draining.

Earthworks should be supervised by a suitably qualified person and compaction levels checked by a GTA in accordance with the Australian Standard AS 3798. Level 2 supervision as outlined in AS 3798 is recommended as a minimum unless a higher level of testing is specified or directed.

The testing frequency during filling should not be less than one test per layer per material type per 2500 m², or one test per 500 m³ distributed reasonably evenly throughout full depth and area, or three tests per lot, whichever requires more tests.

All testing is to be carried out by a NATA registered laboratory with appropriate accreditation and suitably qualified personnel.

5.5.4 *Soil dispersion and erosion*

Detailed design for the proposed development will need to consider the potential for the works to disturb soils at the site and increase erosion. The potential for soils to erode is generally based on the grading of the soil (i.e., the proportion of clay, silt, sand, and gravel) and its organic matter. Silt and fine sands are typically more readily eroded than clays, coarse sand, or gravel. Well-vegetated soils are typically less susceptible to erosion.

Based on our observations made on-site and subsequent laboratory testing the natural soils present appear to be moderately resistant to erosion provided they are suitably covered. If the natural materials are exposed in situ they may experience some slaking, but they are unlikely to disperse, although if the natural soils are remoulded, they could become prone to dispersion.

6 Recommendations for further work

In addition to the geotechnical investigation undertaken and described within this report, we recommend that further geotechnical work be undertaken at the site as follows:

- Electrical and thermal resistivity testing of the site to assist with design of electrical cabling and earthing rods.
- Complete laboratory testing on proposed imported fill materials or the natural materials.
- Carry out a specific settlement analysis on the detailed design and loading conditions.
- Carry out specific bearing capacity analysis on detailed design and loading conditions.
- Carry out a specific pile assessment based on the detailed design and loading conditions.
- Complete laboratory testing on the natural materials to better ascertain the expansive nature of the materials.
- Complete laboratory testing of the natural materials if subgrade stabilisation is the preferred subgrade treatment.

7 Limitations

Scope of services

This geotechnical site assessment report (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on data

In preparing the report, WSP has relied upon data, surveys, analyses, designs, plans, and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, WSP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented, or otherwise not fully disclosed to WSP.

Geotechnical investigation

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared to meet the specific needs of individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor or even some other consulting civil engineer. This report was prepared expressly for the client and expressly for purposes indicated by the client or their representative. Use by any other persons for any purpose, or by the client for a different purpose, might result in problems. The client should not use this report for other than its intended purpose without seeking additional geotechnical advice.

This geotechnical report is based on project specific factors

This geotechnical engineering report is based on a subsurface investigation which was designed for project-specification factors, including the nature of any development, its size and configuration, the location of any development on the site and its orientation, and the location of access roads and parking areas. Unless further geotechnical advice is obtained this geotechnical engineering report cannot be used:

- when the nature of any proposed development is changed
- when the size, configuration location or orientation of any proposed development is modified.

This geotechnical engineering report cannot be applied to any adjacent site.

The limitations of site investigation

In making an assessment of a site from a limited number of boreholes or test pits there is the possibility that variations may occur between test locations. Site exploration identifies specific subsurface conditions only at those points from which samples have been taken. The risk that variations will not be detected can be reduced by increasing the frequency of test locations; however, this often does not result in any overall cost savings for the project. The investigation program undertaken is a professional estimate of the scope of investigation required to provide a general profile of the subsurface conditions. The data derived from the site investigation program and subsequent laboratory testing are extrapolated across the site to form an inferred geological model and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, not matter how comprehensive, can reveal all subsurface details and anomalies.

Subsurface conditions are time dependent

Subsurface conditions may be modified by changing natural forces or man-made influences. A geotechnical engineering report is based on conditions which existed at the time of subsurface exploration.

Construction operations at or adjacent to the site, and natural events such as floods, or groundwater fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

Avoid misinterpretation

A geotechnical engineer should be retained to work with other appropriate design professionals explaining relevant geotechnical finding and in reviewing the adequacy of their plans and specifications relative to geotechnical issues.

Profile logs should not be separated from the engineering report

Final profile logs are developed by geotechnical engineers based upon their interpretation of field logs and laboratory evaluation of field samples. Customarily, only the final profile logs are included in geotechnical engineering reports. These logs should not under any circumstances be redrawn for inclusion in architectural or other design drawings. To minimise the likelihood of profile logs misinterpretation, contractors should be given access to the complete geotechnical engineering report prepared or authorised for their use. Providing the best available information to contractors helps to prevent costly construction problems. For further information on this matter reference should be made to 'Guidelines for the Provision of Geotechnical Information in Construction Contracts' published by the Institution of Engineers Australia, National Headquarters, Canberra 1987.

Geotechnical involvement during construction

During construction, excavation is frequently undertaken which exposes the actual subsurface conditions. For this reason geotechnical consultants should be retained through the construction stage, to identify variations if they are exposed and to conduct additional tests which may be required and to deal quickly with geotechnical problems if they arise.

Report for benefit of client

The report has been prepared for the benefit of the client and no other party. WSP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitations matters arising from any negligent act or omission of WSP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other limitations

WSP will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

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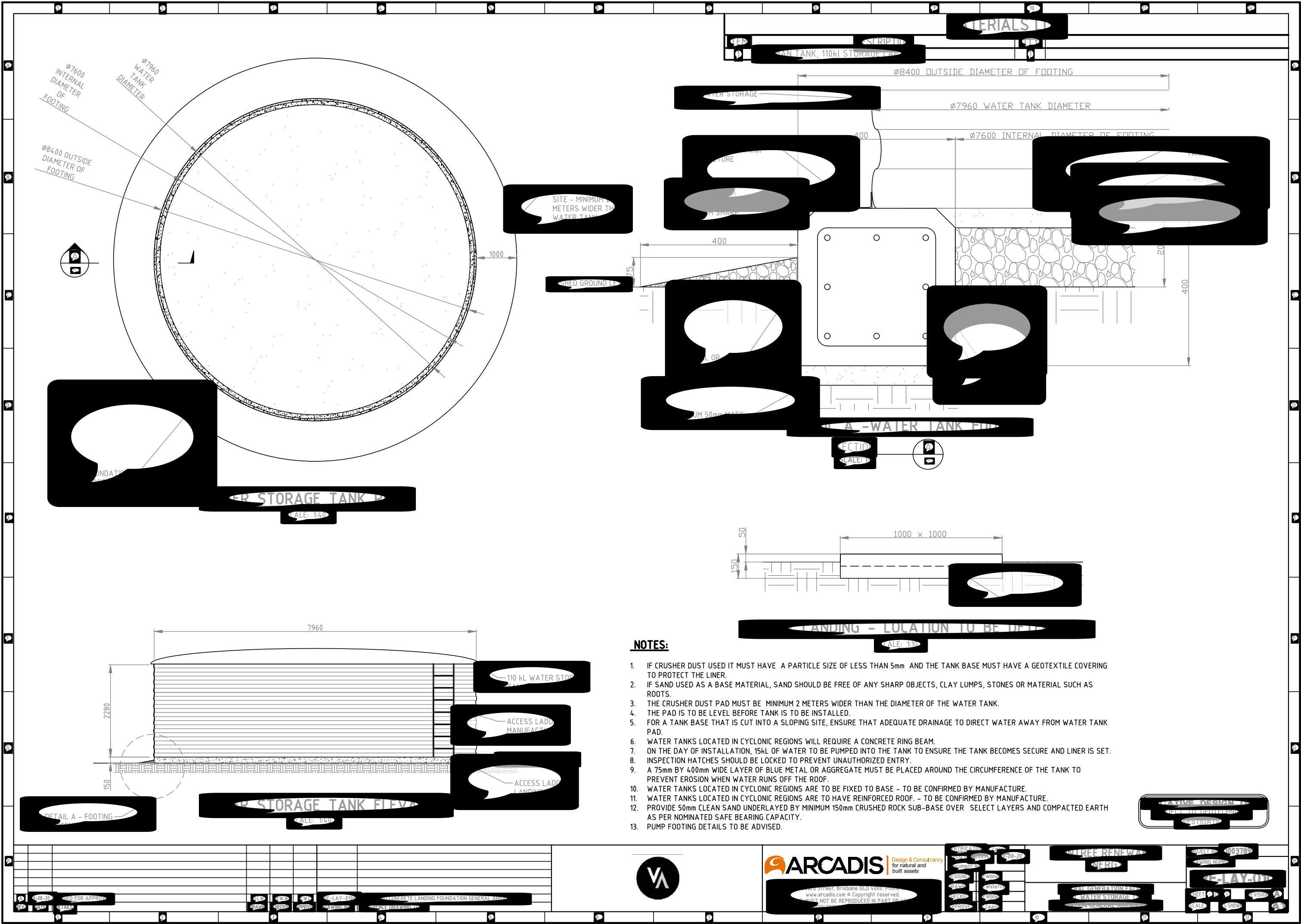
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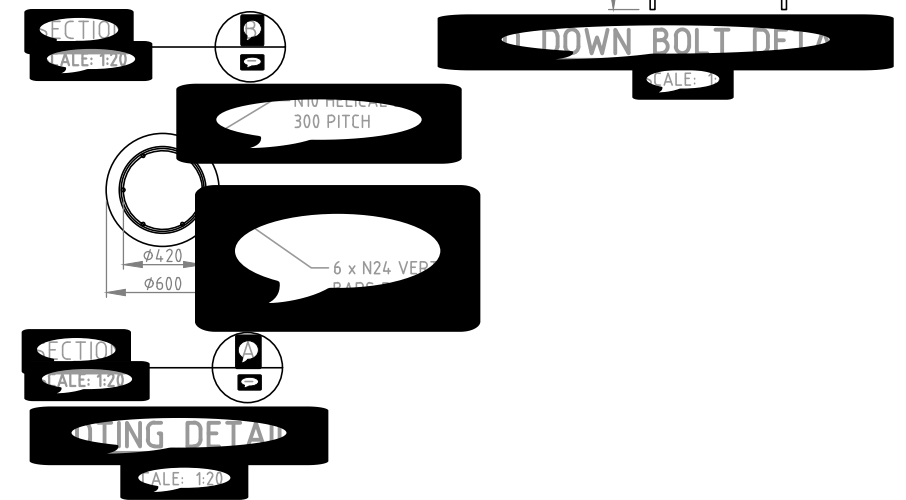
Appendix A

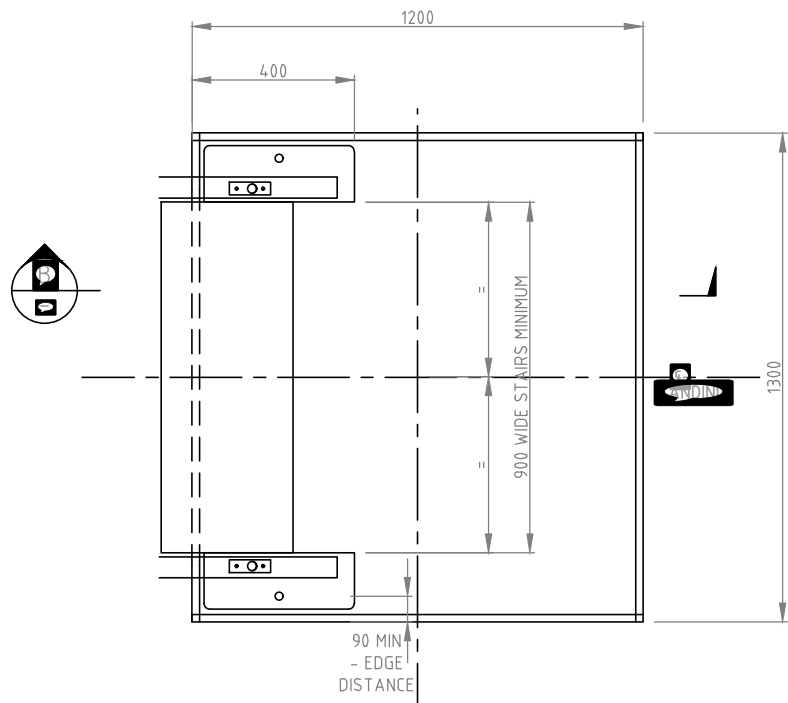
Preliminary design drawings



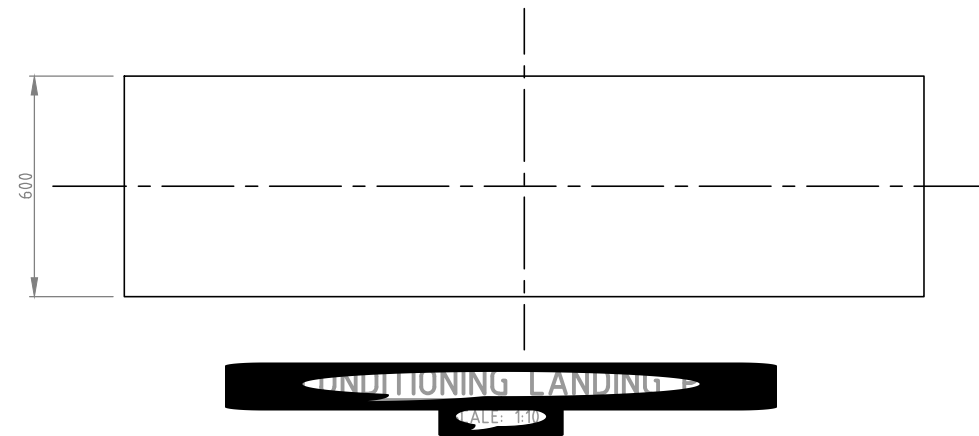
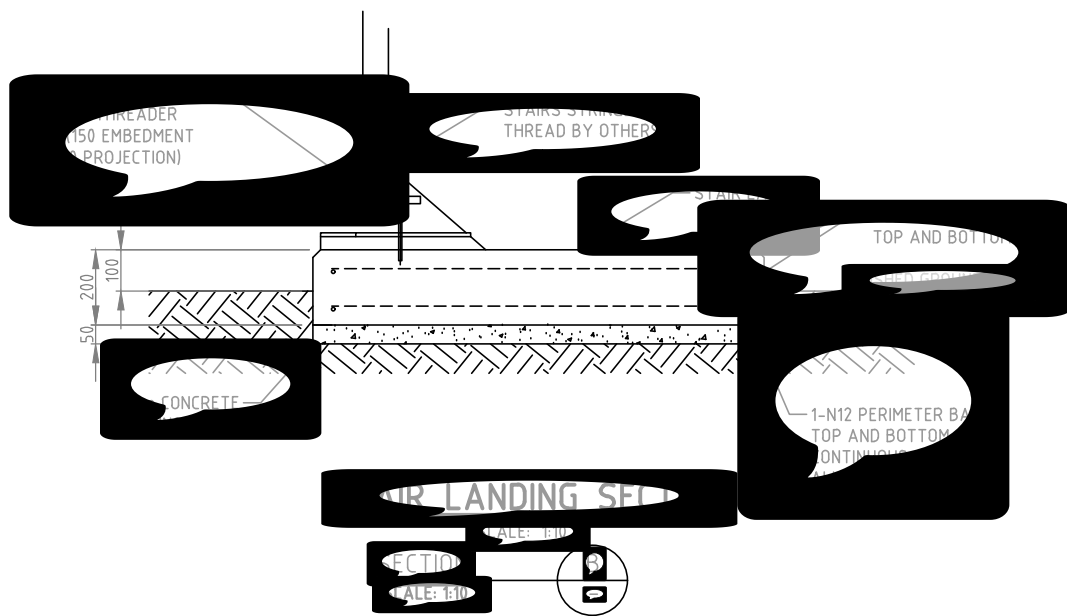




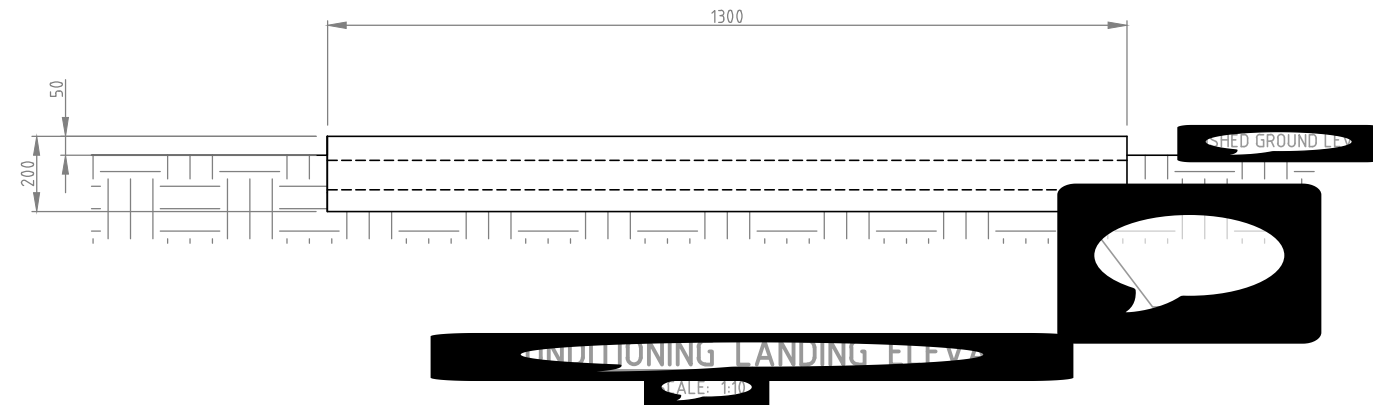




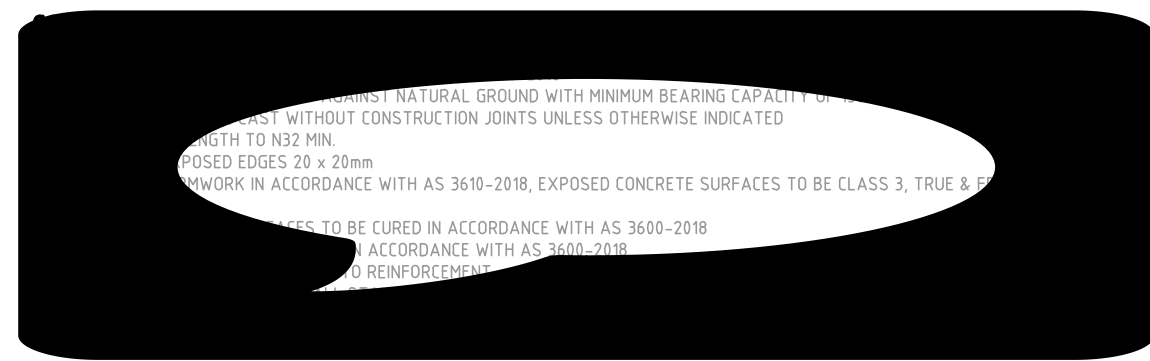
STAIR LANDING PLAN
SCALE: 1:100



CONDITIONING LANDING PLAN
SCALE: 1:100



CONDITIONING LANDING PLAN
SCALE: 1:100



CONCRETE TO BE CAST AGAINST NATURAL GROUND WITH MINIMUM BEARING CAPACITY OF 100 kPa. MINIMUM CONCRETE COVER TO REINFORCEMENT SHALL BE 25mm. EXPOSED EDGES TO BE 20 x 20mm. CONCRETE TO BE CURED IN ACCORDANCE WITH AS 3600-2018. REINFORCEMENT TO BE IN ACCORDANCE WITH AS 3610-2018, EXPOSED CONCRETE SURFACES TO BE CLASS 3, TRUE & FINISH TO BE IN ACCORDANCE WITH AS 3600-2018.

CONDITIONING LANDING PLAN
SCALE: 1:100

NO.	REVISION	DATE	BY	CHKD	APPD
1	ISSUED FOR APPROVAL	08-20	VA	VA	VA
2	ISSUED FOR APPROVAL	08-20	VA	VA	VA
3	ISSUED FOR APPROVAL	08-20	VA	VA	VA
4	ISSUED FOR APPROVAL	08-20	VA	VA	VA
5	ISSUED FOR APPROVAL	08-20	VA	VA	VA
6	ISSUED FOR APPROVAL	08-20	VA	VA	VA
7	ISSUED FOR APPROVAL	08-20	VA	VA	VA
8	ISSUED FOR APPROVAL	08-20	VA	VA	VA
9	ISSUED FOR APPROVAL	08-20	VA	VA	VA
10	ISSUED FOR APPROVAL	08-20	VA	VA	VA



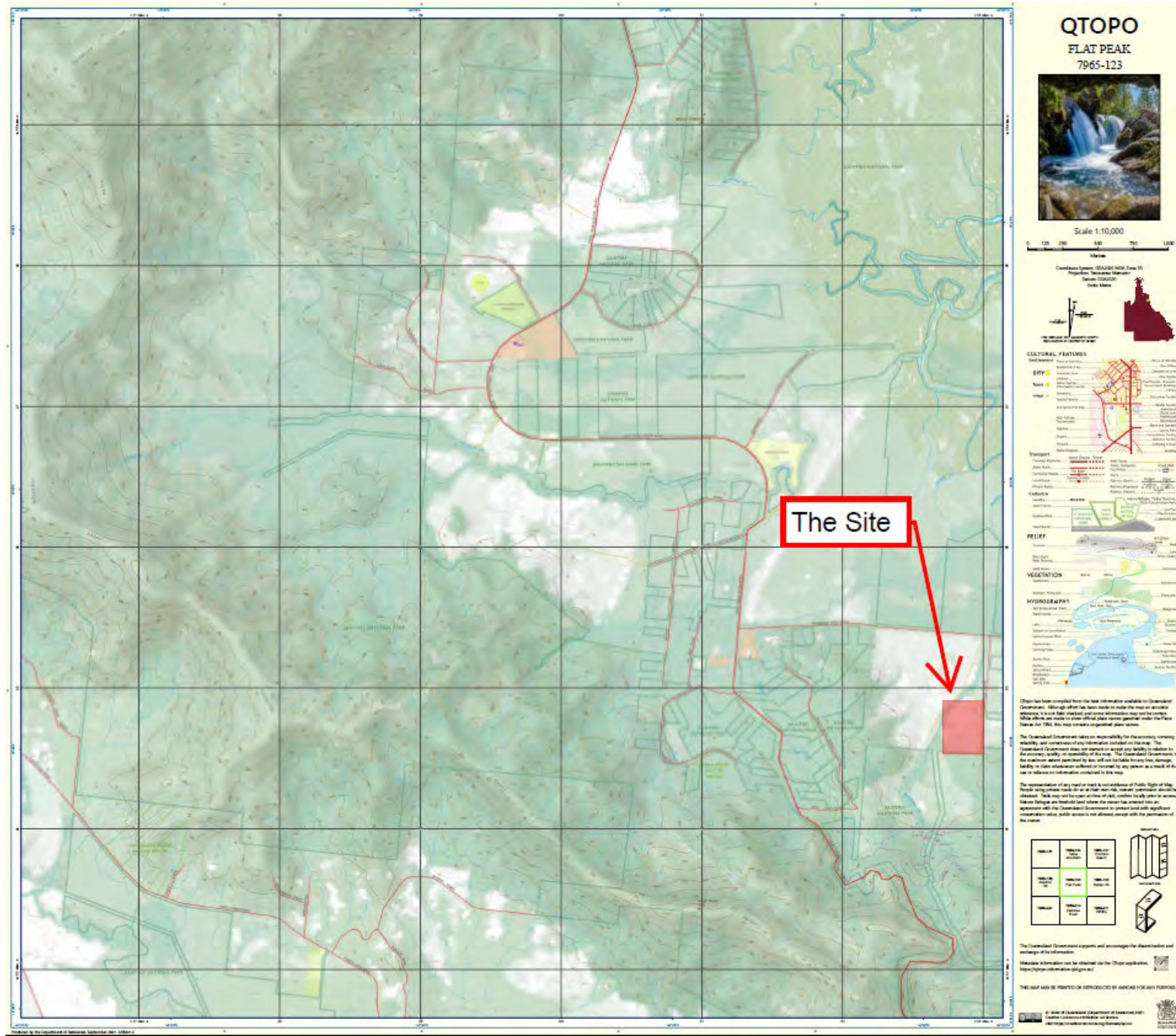
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DESIGNED BY	Wong
DRAWN BY	Wong
CHECKED BY	Wong
APPROVED BY	Wong

PROJECT NO.	00378
DRAWING NO.	00378-01
SHEET NO.	00378-01
SCALE	1:100

DESIGNED BY	Wong
DRAWN BY	Wong
CHECKED BY	Wong
APPROVED BY	Wong





Appendix C

Investigation site plan





DRM Investigation

Figure C.1

CGF Test Locations

LEGEND

Test Locations

● Borehole

■ Test pit

Proposed Development Areas

■ Proposed CGF Extent

■ Proposed Road Extent

■ Proposed Solar Arrays

— Buchanan Creek

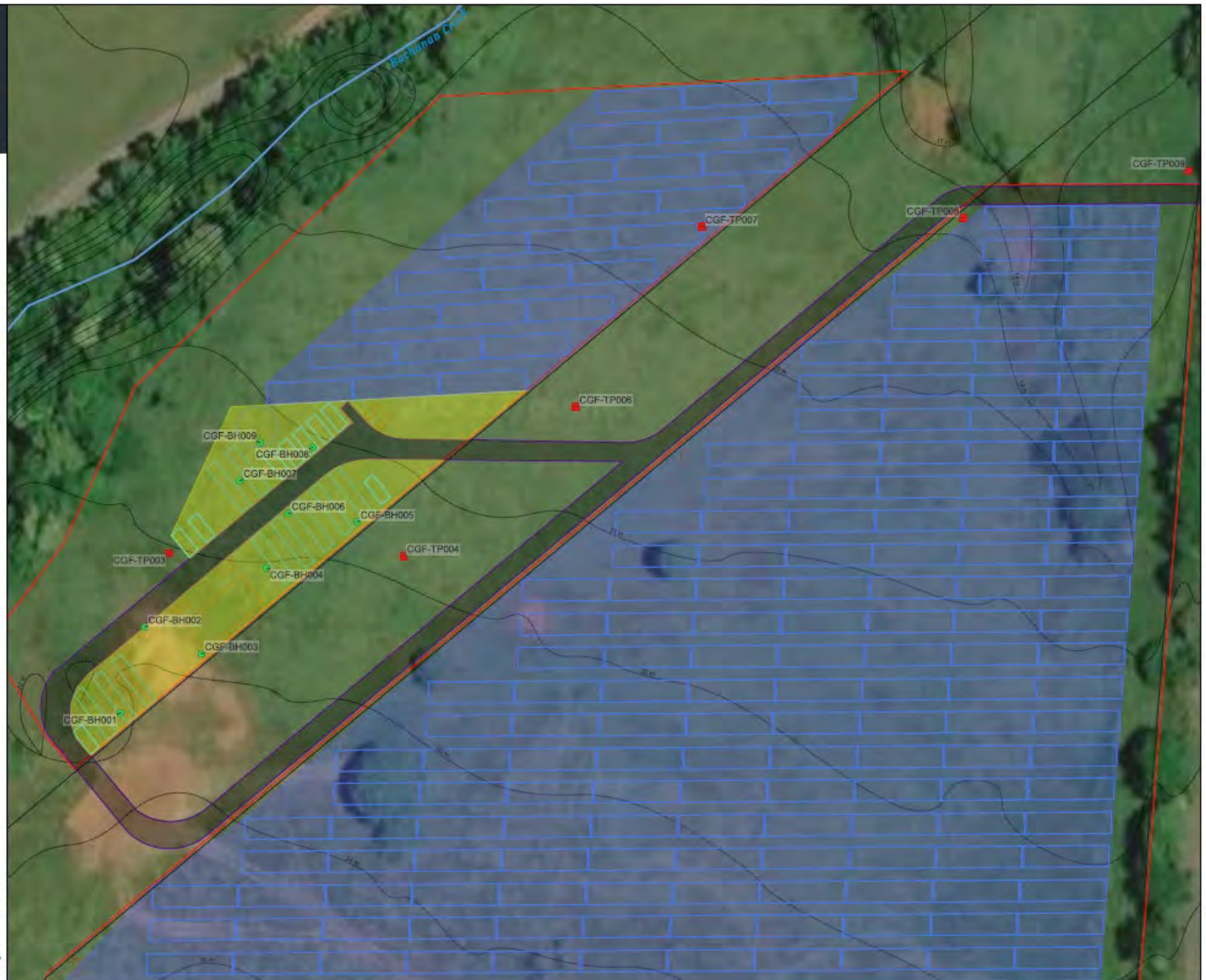


Coordinate System: GDA2020 MGA Zone 55

Scale correct when printed at A3
1:750

Data Source: Base map from Google Satellite. [© WSP Australia Pty Ltd \("WSP"\) Copyright in the drawings, information and data recorded \("the information"\) is the property of WSP. This document and the information are solely for the use of the addressee and the document may not be copied, stored or reproduced in whole or part for any purpose other than that which it was supplied for. WSP makes no representation, warranties or claims and accepts no responsibility to any third party who may use or rely upon this document or the information. NGS Certified Quality System to ISO 9001. © APPROVED FOR AND ON BEHALF OF WSP Australia Pty Ltd.](https://www.google.cn/maps/v7?hl=pt-BR&gl=cn&ll=(x)&y=(y)&z=(z), elevation LIDAR data from Queensland LIDAR Data - Nth Queensland 2009 Project.</p></div><div data-bbox=)

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Appendix D

Investigation reports, photos, and explanatory notes



Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PG135008

Position: Proposed Central Generating Facility
 Coords: 332765 m E 8264779 m N MGA2020-65
 Surface RL: 21.90 m
 Contractor: QIDRI Pty Ltd Drill Rig: Gemco 210B
 Inclination: -90° Hole Dia: 90/120 mm

Sheet 1 of 1

Date Started: 19/12/2022
Date Completed: 19/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (meters)	DEPTH (ft)	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONTENT CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
ADV			0	21.00			CH	Silty CLAY: high plasticity, red-brown, with fine to coarse grained sand.		ALLUVIAL SOIL
			1		SPT 0.50-0.95 m 2,1,2 N=3 D 0.50-0.95 m PP 0.70 m =100-150 kPa					
WE			2		SPT 1.50-1.95 m 1,2,2 N=4 D 1.50-1.95 m				w=PL	SI
			3	7.00 15.00	SPT 3.00-3.45 m 4,2,11 N=18 D 3.00-3.45 m PP 3.20 m =290-370 kPa		Trace fine to coarse grained gravel; trace fine to coarse grained sand.		VS	
SPT			4	4.00 17.00			CH	High plasticity, red-brown mottled pale brown.		
			5		SPT 4.50-4.95 m 13,20,30 N=50 D 4.50-4.95 m PP 4.70 m =800 kPa				w=PL	
			6	6.00 15.00	SPT 5.00-5.45 m 9,14,19 N=33 D 5.00-5.45 m PP 5.20 m =600 kPa			Red-brown mottled pale grey and pale brown.		H
			7	7.00 14.00			CI	Gravelly CLAY: medium plasticity, red-brown mottled pale brown, gravel is fine to coarse grained, with fine to coarse grained sand.		
			8	7.95	SPT 7.50-7.95 m 9,19,16 N=35 D 7.50-7.95 m					
								Hole Terminated at 7.95 m Target depth		

Comments
Backfilled; location about 1.5 m below surrounding ground level, inside pit

Checked	SB8
Date	18/1/2023

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BOREHOLE: CGF-BH002

Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PG 135008

Position: Proposed Central Generating Facility
Coords: 332770 m E 8204797 m N MGA2020-55
Surface RL: 22.00 m
Contractor: QDrill Pty Ltd Drill Rig: Gemco 210B
Inclination: -90° Hole Dia.: 90/120 mm

Sheet 1 of 1
Date Started: 18/12/2022
Date Completed: 18/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONTENT CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
ADV			0	22.00				CL	Gravelly CLAY: low plasticity, brown, gravel is fine to coarse grained, rounded to sub-angular; with fine to coarse grained sand; trace cobbles	npPL	ALLUVIAL SOIL	
			0.50									
			21.50	SPT 0.50-0.95 m 2.2.2 N=4 0 0.50-0.95 m		CI	CLAY: medium plasticity, red-brown.					
			1									
			2	SPT 1.50-1.95 m 2.2.3 N=5 0 1.50-1.95 m PP 1.70 m 4110-180 kPa				St				
			3	SPT 3.00-3.45 m 4.5.7 N=12 0 3.00-3.45 m PP 3.20 m 4040-370 kPa				VSI				
			4									
			4.50									
			17.50	SPT 4.50-4.95 m 12.00.26 N=48 0 4.50-4.95 m		CH	Silty CLAY: high plasticity, red-brown, trace fine to coarse grained sand.					
			5									
6												
6.00												
16.00	SPT 6.00-6.45 m 11.16.24 N=40 0 6.00-6.45 m											
7												
7.50												
14.50	SPT 7.50-7.95 m 16.15.20 N=35 0 7.50-7.95 m											
7.95												
			0						Hole terminated at 7.95 m Target depth			

Comments
Backfilled, location within former borrow pit about 700 mm below the surrounding ground level.

Checked: SBB
Date: 18/1/2023

Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PS135008

Position: Proposed Central Generating Facility
 Coordn: 332782 m E 8204791 m N MGA2020-55
 Surface RL: 22.80 m
 Contractor: QDrill Pty Ltd Drill Rig: Gemco 210B
 Inclination: -90° Hole Dia: 90/120 mm

Sheet: 1 of 1

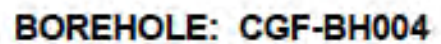
Date Started: 19/12/2022
Date Completed: 19/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description									
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (meters)	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DCP TEST Blows per 100 mm					
										0	5	10	15	20	25
ADV			0	22.90		C1	Grossly CLAY; medium plasticity, red-brown, gravel is fine to coarse grained, sub-angular; with fine to coarse grained sand.	w=PL	St						
				(SPT) 22.10		SPT 0.50-0.95 m 5.4.2 N=6 D 0.50-0.95 m	C1			Silty CLAY; high plasticity, red-brown, with fine to coarse grained sand; with fine to coarse grained, sub-angular gravel.					
			1	1.50			Trace fine to medium grained sand; without gravel.								
				21.30		LBD 1.50-1.95 m									
			2												
						PP 1.95 m +180-210 kPa									
			3	3.00			Trace fine grained, rounded, black gravel.	w=PS	St-VSB						
				19.90		SPT 3.00-3.45 m 3.4.5 N=6 D 3.00-3.45 m PP 3.20 m +160-225 kPa									
			4												
			5	5.00											
						SPT 4.50-4.95 m 3.5.7 N=12 D 4.50-4.95 m PP 4.70 m +170-240 kPa									
			6	6.00		C1	High plasticity, red-brown mottled pale brown.	w=PL	H						
						SPT 5.00-5.45 m 10.19.28 N=45 D 5.00-5.45 m PP 6.20 m +800 kPa									
SPT			7												
			8	7.95			Instr. Terminated at 7.95 m Target depth.								

Comments
Backfiled.

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Date	18/1/2023

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Sheet 1 of 1

Date Started: 19/12/2022
Date Completed: 19/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (meters)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
ADV			0	22.00			CL	CLAY, low plasticity, brown, trace fine to coarse grained gravel, trace fine to coarse grained sand.		ALLUVIAL SOIL	
			0.50								
			21.50	USO 0.50-0.95 m		CH	Silty CLAY, high plasticity, red-brown, with fine to coarse grained sand, trace fine grained gravel.				
			1	7.00	PP 0.95 m 4550-4500 kPa		CI	Onively CLAY, medium plasticity, red-brown, gravel is fine to coarse grained, sub-angular to angular, with fine to coarse grained sand, trace cobbles.			
			21.00								
			1.70	SPT 1.50-1.95 m 3.2,3 N=5 D 1.50-1.95 m		CI	CLAY, medium plasticity, red-brown, trace fine to coarse grained sand.				
			20.30								
			2								
WE			3	3.00						GR	
			19.00	SPT 3.00-3.45 m 3.3,5 N=6 D 3.00-3.45 m			Trace fine grained, rounded, black gravel.				
			4								
SPT			5	6.00						VBI	
			16.00	SPT 6.00-6.45 m 12,19,29 N=48 D 6.00-6.45 m		CH	CLAY, high plasticity, red-brown mottled pale brown.				
			7	7.95						H	
			8							Hole Terminated at 7.95 m Target depth	

Comments:
Backfilled.

Checked: SBB
Date: 18/1/2023

Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PS135008

Position: Proposed Central Generating Facility
 Coords: 332816 m E 8204820 m N MGA2020-55
 Surface RL: 21.60 m
 Contractor: QDrill Pty Ltd Drill Rig: Gemco 210B
 Inclination: -90° Hole Dia: 90/120 mm

Sheet 1 of 1

Date Started: 18/12/2022
Date Completed: 18/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONTENT	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
ADV			0	21.80			CI	Gravelly CLAY: medium plasticity, brown, gravel is fine to coarse grained, sub-angular to angular, trace fine to coarse grained sand			ALLUVIAL SOIL
			0.50								
SPT			21.10	SPT 0.50-0.95 m 3.3.3 N=5 Ø 0.50-0.95 m			CL	Low plasticity, red-brown.			
			1								
			7.50								
			20.10	SPT 1.50-1.95 m 2.2.4 N=6 Ø 1.50-1.95 m			CI	CLAY: medium plasticity, brown, trace fine to coarse grained, some coarse grained, black, nodulus sand.	wp(1)	SI	
			2								
			3								
			13.10	SPT 3.00-3.45 m 3.7.10 N=17 Ø 3.00-3.45 m			CL	Low plasticity, with fine grained, rounded, black gravel.	wp(1)		
			18.50				CI	Medium plasticity, red-brown, without sand and gravel.			
			4								
			4.50								
			17.10	SPT 4.50-4.95 m 8.11.18 N=20 Ø 4.50-4.95 m			CH	Silty CLAY: high plasticity, red-brown, trace fine grained, rounded gravel trace fine to coarse grained sand.			
			5								
			6.00								
			15.50	SPT 6.00-6.45 m 11.19.24 N=43 Ø 6.00-6.45 m				With fine to coarse grained sand.			
			6								
			6.30								
			15.30				CI	Gravelly CLAY: medium plasticity, red-brown mottled pale brown, gravel is fine to coarse grained, sub-angular to angular, with fine to coarse grained sand.			
			7								
			7.00								
			14.50				CH	CLAY: high plasticity, red-brown mottled pale grey			
			8								
			7.95	SPT 7.50-7.95 m 8.14.18 N=32 Ø 7.50-7.95 m							
			8					Hole Terminated at 7.95 m Target depth			

Comments Backfilled.

Checked SBB
Date 18/1/2023

**BOREHOLE: CGF-BH006**

Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PS 135008

Position: Proposed Central Generating Facility
Coords: 332801 m E 8204822 m N MGA2020-55
Surface RL: 21.70 m
Contractor: QDrill Pty Ltd Drill Rig: Gemco 210B
Inclination: -90° Hole Dia.: 90/120 mm

Sheet 1 of 1
Date Started: 18/12/2022
Date Completed: 18/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description							
METHOD	PERMEATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONTENT CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
ADV	C	H	0	21.70				CI	CLAY: medium plasticity, brown, with fine to coarse grained sand; with fine to coarse grained, sub-rounded to sub-angular gravel.		ALLUVIAL SOIL		
			0.50										
WB	C		0.50	21.20	SPT 0.50-0.95 m 1,2,3 N=5 Ø 0.50-0.95 m				Red-brown, trace fine to coarse grained, sub-rounded to sub-angular gravel; trace fine to coarse grained sand.	St			
			1						0.50-0.90 m - Cobble				
			2										
			3										
			3.00										
			3.00	19.70	SPT 3.00-3.45 m 3,8,10 N=18 Ø 3.00-3.45 m PP 3.20 m ~250-~500 kPa		CL / CI	Low to medium plasticity, with fine to coarse grained sand; trace fine grained, rounded to sub-rounded, black gravel.	enPL			VSU	
			4										
			4.50										
			4.50	17.20	SPT 4.50-4.95 m 7,12,17 N=29 Ø 4.50-4.95 m		CI	Medium plasticity.					H
			5										
5.00	15.70	SPT 5.00-5.45 m 14,15,13 N=28 Ø 5.00-5.45 m		CI	Gravelly CLAY: medium plasticity, red-brown, gravel is fine to coarse grained, sub-angular to angular; with fine to coarse grained sand.								
6													
7.50													
SPT			14.20	7.50	SPT 7.50-7.95 m 11,14,19 N=23 Ø 7.50-7.95 m			CH	Silty CLAY: high plasticity, red-brown mottled pale brown, with fine to coarse grained sand; trace fine grained gravel.				
			7.95										
			8						Hole Terminated at 7.95 m Target depth				
Comments Backfilled.													
Checked										SBB			
Date										18/1/2023			

WSP-4111-03-18-006 Log to AUSTRALIAN STANDARDS 1.0000 (2008) (2007) - revised 2018-08-08 08:08:08 (Log to AUSTRALIAN STANDARDS 1.0000 (2008) (2007) - revised 2018-08-08 08:08:08)

Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PS135008

Position: Proposed Central Generating Facility
 Coords: 332791 m E 8204829 m N MGA2020-55
 Surface RL: 21.50 m
 Contractor: QDrill Pty Ltd Drill Rig: Gemco 210B
 Inclination: -90° Hole Dia.: 90/120 mm

Sheet: 1 of 1

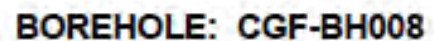
Date Started: 17/12/2022
Date Completed: 17/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description			
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (meters)	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
ADV			0	21.00		CL	CLAY: medium plasticity, brown, with fine to coarse grained sand.		ALLUVIAL SOIL
			0.50	21.00	SPT 0.50-0.95 m 3, 2, 3 N=5 D 0.50-0.95 m PP 0.70 m ~250-350 kPa		Trace fine grained, rounded, black gravel; trace fine to coarse grained sand.		
			1	1.00	10.70	SPT 1.00-1.35 m 2, 4, 5 N=5 D 1.00-1.35 m		Without gravel.	
			2	3.00	18.50	SPT 3.00-3.45 m 5, 8, 10 N=18 D 3.00-3.45 m		Red-brown, trace fine grained, rounded black gravel; trace coarse grained, black, nodular sand.	
			3	4.00	16.50	SPT 4.00-4.35 m 6, 9, 11 N=20 D 4.00-4.35 m PP 4.70 m ~250-400 kPa		Red-brown mottled pale brown, with fine to coarse grained sand.	
			4	5.00	15.40		With fine to coarse grained gravel, trace cobbles. Trace fine to coarse grained sand.		
			5	5.60	15.70	SPT 5.00-5.45 m 11, 18, 30 N=48 D 5.00-5.45 m	GM	Gravelly Silty SAND: fine to coarse grained, brown mottled red-brown and pale brown, silt is high plasticity, gravel is fine to medium grained, rounded to sub-rounded, trace cobbles.	
			6	7.50	14.00	SPT 7.50-7.95 m 15, 23, 15 N=39 D 7.50-7.95 m		Increasing gravel content.	
			7	7.95			None Terminated at 7.95 m Target depth		

Comments
Backfiled.

Checked: SSB
Date: 18/1/2023

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Sheet 1 of 1

Date Started: 17/12/2022
Date Completed: 17/12/2022
Logged: NLP

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Checked	SB8
Date	18/1/2023

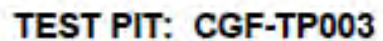
Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PS135008

Position: Proposed Central Generating Facility
 Coords: 332795 m E 8204837 m N MGA2020-55
 Surface RL: 21.20 m
 Contractor: GDrill Pty Ltd Drill Rig: Gemco 210B
 Inclination: -90° Hole Dia.: 90 mm

Sheet 1 of 1

Date Started: 17/12/2022
Date Completed: 17/12/2022
Logged: NLP

Drilling				Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (meters)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONTENT	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
SPT			0	21.20			CI	CLAY: medium plasticity, brown, trace fine to coarse grained sand.				ALLUVIAL SOIL
			0.50-0.98 m	SPT 0.50-0.98 m 2.3.4 N=7 D 0.50-0.98 m								
			1.50-1.98 m	SPT 1.50-1.98 m 3.4.3 N=7 D 1.50-1.98 m PP 1.70 m w=300-370 kPa		CH	Silty CLAY: high plasticity, red-brown, trace fine to coarse grained sand.					
			3.00-3.48 m	SPT 3.00-3.48 m 3.3.4 N=7 D 3.00-3.48 m								
			4.50-4.98 m	SPT 4.50-4.98 m 4.5.7 N=12 D 4.50-4.98 m								
			6.00	15.20				Red-brown mottled pale brown, trace fine to medium grained rounded, black gravel; increasing gravel content.				
			6.50	14.90			CI	Gravelly CLAY: medium plasticity, red-brown mottled pale brown, gravel is fine to coarse grained, sub-angular to angular; with fine to coarse grained sand.				
			7.50-7.98 m	SPT 7.50-7.98 m 12.21.17 N=38 D 7.50-7.98 m								
			7.98					Hole Terminated at 7.98 m Target depth				
Comments Backfilled.												
											Checked	SBB
											Date	18/1/2023



Sheet 1 of 1

Date: 20/12/2022

Logged: NLP

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Checked: 388
Date: 18/1/2023

Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PG135008

Position: Proposed Central Generating Facility
 Coords: 332826 m E 8204813 m N MGA2020-55
 Surface RL: 21.70 m
 Contractor: Heath's Excavations
 Machine: Kubota K05D-4 Bucket Size: 450 mm to

Sheet 1 of 1

Date: 20/12/2022
Logged: NLP

[illegible]

Comments
Backfiled.

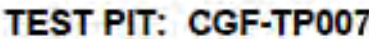
Checked	SEB
Date	18/1/2023



TEST PIT: CGF-TP006

Project:	Daintree Renewable Microgrid	Position:	Proposed Central Generating Facility	Sheet	1 of 1
Location:	Daintree	Coords:	332863 m E 8204845 m N MGA2020-55		
Client:	Volt Advisory Group Pty Ltd	Surface RL:	20.60 m	Date:	20/12/2022
Job No.:	PS135008	Contractor:	Heath's Excavations	Logged:	NLP
		Machine:	Kubota K057-4 Bucket Size: 450 mm tooth bucket		

Excavation			Sampling		Field Material Description												
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	DCP TEST Blows per 100 mm					
												0	5	10	15	20	25
1	1	No Encountered	0.0	20.50	B 0.20-0.30 m PP 0.30 m +150-220 kPa 0.50 20.10 PP 0.70 m +480-510 kPa 0.80 19.80 PP 0.90 m +400-+500 kPa		CL	CLAY: low plasticity, dark brown, trace fine grained gravel; trace fine to coarse grained sand, with roots and root fibres.		St-Vol							
			0.15	20.45				Brown, with fine to coarse grained sand; trace roots and root fibres.									
			0.2														
			0.4														
			0.6					Medium plasticity, brown-red, trace fine to coarse grained sand; without gravel, roots, or root fibres.									
			0.8														
			1.0					Brown.									
			1.2														
			1.4														
			1.6														
1.8																	
2.0	19.00																
			2.0						Hole Terminated at 200m. Target depth								
			2.2														
			2.4														



Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PS135008

Position: Proposed Central Generating Facility
 Coords: 332891 m E 8204884 m N MGA2020-55
 Surface RL: 19.70 m
 Contractor: Heath's Excavations
 Machine: Kubota KX157-4 Bucket Size: 450 mm to

Sheet: 1 of 1

Date: 20/12/2022

Logged: NLP

Excavation				Sampling		Field Material Description												
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONTENT	COMBUSTION LOSS	CONSISTENCY DENSITY	DCP TEST Blows per 100 mm						
											0	5	10	15	20	25		
E	F	Not Encountered	0.0	10.70			CL	CLAY, low plasticity, brown, with fine to coarse grained sand, with roots and root fibres.										
			0.15	10.55			CH	Silty CLAY, high plasticity, brown-red, trace fine to medium grained sand.										
			0.2		RP 0.20 m +300-400 kPa													
			0.4		S 0.40-0.50 m RP 0.40 m +280-350 kPa													
			0.6		RP 0.60 m +450-550 kPa													
			0.8	0.80	10.30	RP 0.80 m +500-550 kPa				Red-brown, with fine grained, rounded, black gravel								
			1.0		S 1.00-1.10 m													
			1.2															
			1.4															
			1.6															
			1.8															
			2.0															
			2.2															
			2.30															
			2.4							Hole Terminated at 2.30 m Target depth								

Comments
Backfilled.

Checked	SBH
Date	18/1/2023

Date: 18/1/2023



TEST PIT: CGF-TP008

Project: Daintree Renewable Microgrid
Location: Daintree
Client: Volt Advisory Group Pty Ltd
Job No.: PS135008

Position: Proposed Central Generating Facility
Coords: 332947 m E 8204886 m N MGA2020-55
Surface RL: 19.00 m
Contractor: Heath's Excavations
Machine: Kubota KX057-4 Bucket Size: 450 mm tooth bucket

Sheet 1 of 1
Date: 20/12/2022
Logged: NLP

Excavation				Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (m)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	GROUP SYMBOL	SOLIROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	OCP TEST Blows per 100 mm
											0 5 10 15 20 25
			0.0	19.00			CL	CLAY: low plasticity, brown, with fine to coarse grained sand; with roots and root fibres.			
			0.20	18.80	PP 0.10 m +100-150 kPa						
			0.2	18.60	S 0.20-0.30 m			Brown-red, trace roots and root fibres.			
			0.4		PP 0.40 m +100-300 kPa						
			0.6		PP 0.60 m +310-400 kPa						
			0.70	18.30			CL	Medium plasticity, red-brown, trace fine grained, rounded, black gravel; trace fine to coarse grained sand; without roots or root fibres.			
			0.8		PP 0.80 m +500-+500 kPa						
			1.0								
			1.2								
			1.30	17.70				Medium plasticity, red-brown, trace fine to coarse grained sand; without gravel.			
			1.4								
			1.6								
			1.8								
			2.0								
			2.2	2.20				Hole Terminated at 2.20m Target depth			
			2.4								

Not Excavated

Comments Backfilled.

Checked: SBB
Date: 18/1/2023



TEST PIT: CGF-TP009

Project:	Daintree Renewable Microgrid	Position:	Proposed Central Generating Facility	Sheet:	1 of 1
Location:	Daintree	Coords:	332996 m E 8204896 m N MGA2020-65		
Client:	Volt Advisory Group Pty Ltd	Surface RL:	19.50 m	Date:	20/12/2022
Job No.:	PS135008	Contractor:	Heath's Excavations	Logged:	NLP
		Machine:	Kubota FOX57-4 Bucket Size: 450 mm tooth bucket		

Excavation				Sampling		Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONTENT	COMBINED DENSITY	DCP TEST Blows per 100 mm
												0 5 10 15 20 25
			0.0	19.50				CL	CLAY low plasticity, brown, with fine to coarse grained sand; with roots and root fibres.	6-8%	F	
			0.15	19.35	PP 0.10 m +150-200 kPa			CI	Silty CLAY medium plasticity, red-brown, trace fine to medium grained sand; trace roots, without sand or root fibres.			
			0.30		PP 0.30 m +150-250 kPa						SI - VSH	
			0.50	19.10	PP 0.50-0.80 m PP 0.50 m +350-390 kPa				Trace fine to coarse grained sand.			
			0.70		PP 0.70 m +330-350 kPa							
			1.0									
			1.2									
			1.4									
			1.6									
			1.8									
			2.0									
			2.2						Now Terminated at 2.10 m Target depth.			
			2.4									

Comments Backfilled.

Checked: 888
Date: 18/1/2023






Explanatory Notes – Engineering Logs

Engineering logs have been prepared in general accordance with AS1726:2017 "Geotechnical Site Investigations", AGS 4.1AU data format and as defined below.

DRILLING/EXCAVATION METHODS

Symbol	Term
AD/T	Auger drilling with TC-bit
AD/V	Auger drilling with V-bit
AS	Auger screwing
AT	Air track / rotary air blast
DP	Direct push
DT	Distube
E	Excavator
HA	Hand auger
HAND	Hand excavation
HSA	Hollow stem auger
NMLC/HMLC	Diamond core – triple tube
NQ3/HQ3/PQ3	Diamond core – wireline
RC	Reverse circulation
RR	Rock roller
S	Sonic drill
VB	Vibrocoring
VE	Vacuum extraction
WB	Washbore with blade or drag bit

WATER

	Complete water loss		Outflow
	Partial water loss		Inflow
	Water level at date shown		

NOT OBSERVED – not possible to assess groundwater conditions e.g. due to drilling water, surface seepage or cave-in
 NOT ENCOUNTERED – the hole was dry soon after excavation, however, groundwater could be present in less permeable strata. Inflow may have been observed had the hole been left open for a longer period

FIELD TEST (Soil borehole and test pit logs)

DCP	Dynamic Cone Penetrometer
HB	Hammer bounce
HW/RW	SPT penetration under rod/hammer weight only
OT	Other test (e.g., plate load test)
PID	Photoionisation detector
PKT	Permeability test (various methods)
PRM	Pressuremeter test
PP	Pocket penetrometer
PSP	Perth sand penetrometer
SPT	Standard penetration test, with 'N' value
VST	Shear vane test

SAMPLE

B	Bulk disturbed sample
C	Core sample
CBR	CBR mould sample
D	Small disturbed sample
ES	Soil sample for environmental testing
EW	Water sample for environmental testing
G	Gas sample
P	Piston sample
U63	Push tube sample (with diameter in mm)
W	Water sample

TOTAL CORE RECOVERY (Rock logs only)

$$TCR (\%) = \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$$

ROCK QUALITY DESIGNATION (Rock logs only)

$$RQD (\%) = \frac{\sum \text{Length of sound core pieces} > 100\text{mm}}{\text{Length of core run}} \times 100$$

GROUP SYMBOL (Soil borehole and test pit logs)

Soils are classified to reflect their primary and significant secondary component/characteristic using the classification symbols described in AS1726-2017, summarised as follows.

Symbol	Major division	Typical names
GW, GP	GRAVEL	Gravel & gravel-sand mixtures, little/no fines
GM		Gravel-silt & gravel-sand-silt mixtures
GC		Gravel-clay & gravel-sand-clay mixtures
SW, SP	SAND	Sand & gravel-sand mixtures, little/no fines
SM		Sand-silt mixtures
SC		Sand-clay mixtures
ML	SILT & CLAY (low & medium plasticity)	Inorganic silt/clayey fine sand or silt
CL, CI		Inorganic clay, gravelly clay, sandy clay
OL		Organic silt
MH	SILT & CLAY (high plasticity)	Inorganic silt
CH		Inorganic clay, high plasticity
OH		Organic clay, med-high plasticity, organic silt
Pt	Highly organic soil	Peat, highly organic soil

FIELD DESCRIPTION

Soil and rock materials described in general accordance with AS1726-2017. The description of percentage of cobbles and boulders in a soil may be limited by sample size.

MOISTURE CONDITION

Coarse grained soils and rocks

Dry (D), Moist (M) or Wet (W).

Estimated based on appearance and feel.

Cohesive soils (estimated based on judgement)

Symbol	Term
MC<PL	Moist, dry of plastic limit
MC=PL	Moist, near plastic limit
MC>PL	Moist, wet of plastic limit
MC=LL	Wet, near liquid limit
MC>LL	Wet, wet of liquid limit

COHESIVE SOILS – CONSISTENCY

The consistency of a cohesive soil is assessed by tactile means or field measurement of undrained shear strength. A Hand Penetrometer may be used in the field or the laboratory to provide approximate assessment of unconfined compressive strength of cohesive soils (kPa) as follows:

Strength	Symbol	Indicative undrained shear strength (kPa)	Hand Penetrometer Reading (kPa)
Very Soft	VS	≤ 12	< 25
Soft	S	> 12 and ≤ 25	25 to 50
Firm	F	> 25 and ≤ 50	50 to 100
Stiff	St	> 50 and ≤ 100	100 to 200
Very Stiff	VSt	> 100 and ≤ 200	200 to 400
Hard	H	> 200	> 400
Frangible	Fr	-	-

COHESIONLESS SOILS – RELATIVE DENSITY

Relative density terms are used to describe silty and sandy material, and these are usually based on resistance to drilling penetration or the Standard Penetration Test (SPT) 'N' values.

The Standard Penetration Test (SPT) is carried out in accordance with AS 1289, 6.3.1. For completed tests the number of blows required to drive the split spoon sampler 300 mm is recorded as the N value. For incomplete tests the number of blows and the penetration beyond the seating

depth of 150 mm are recorded. If the 150 mm seating penetration is not achieved the number of blows to achieve the measured penetration is recorded. SPT correlations may be subject to corrections for overburden pressure and equipment type.

Term	Symbol	Density Index	N Value (blows /0.3 m)	DCP (blows/100 mm)
Very Loose	VL	0 to 15	0 to 4	0 to 1
Loose	L	15 to 35	4 to 10	1 to 2
Medium Dense	MD	35 to 65	10 to 30	2 to 3
Dense	D	65 to 85	30 to 50	4 to 8
Very Dense	VD	>85	>50	>8

SOIL STRUCTURE

Soil structure is described to AS 1726-2017 if visible and present.

SOIL / ROCK ORIGIN

The geological origin of the soil or rock is presented as an interpretation of the geological and geomorphological setting. Origin cannot be deduced on the basis of material appearance and properties alone and is therefore limited by the availability of supporting geological information.

ROCK MATERIAL WEATHERING

Rock weathering is described mainly using the following abbreviations and definitions used in AS1726.

Term	Symbol	Definition
Residual soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	Rock shows no sign of decomposition of individual minerals or colour changes.



If differentiation between highly and moderately weathered rock is not practicable, then Distinctly Weathered (DW) is used as defined in AS1726:2017.

INFERRED ROCK STRENGTH

Rock strength is Inferred based on field assessment, Point Load Index (AS4133.4.1) or Uniaxial Compressive Strength (AS 4133.4.2.1) as follows:

Term	Symbol	UCS (MPa)	Point Load Index $I_{p(50)}$ (MPa)*
Very Low	VL	0.6 to 2	0.03 to 0.1
Low	L	2 to 6	0.1 to 0.3
Medium	M	6 to 20	0.3 to 1
High	H	20 to 60	1 to 3
Very High	VH	60 to 200	3 to 10
Extremely High	EH	>200	>10

*example based on $UCS = 20 \times I_{p(50)}$, actual correlation factor varies across rock types and weathering grades

-  Axial/Diametral Point Load Index test
 Uniaxial Compressive Strength test

DEFECT SPACING/BEDDING SPACING (Rock)

Measured at right angles to defects of same set or bedding.

Term	Defect Spacing	Bedding
Extremely closely spaced	<6 mm 6 to 20 mm	Thinly Laminated Laminated
Very closely spaced	20 to 60 mm	Very Thin
Closely spaced	0.05 to 0.2 m	Thin
Moderately widely spaced	0.2 to 0.6 m	Medium
Widely spaced	0.6 to 2 m	Thick
Very widely spaced	>2 m	Very Thick

DEFECT TYPE (Rock)

Symbol	Term	Symbol	Term
CS	crushed seam	J	joint
DB	drilling break	MB	mechanical break
DL	drill lift	P	parting
EW	extremely weathered seam	S	sheared surface
HB	handling break	SS	shear seam
IS	infill seam	SZ	shear zone

DEFECT ORIENTATION (Rock)

Dip measured relative to the horizontal plane in vertical boreholes and relative to core axis in inclined boreholes.

DEFECT ROUGHNESS AND SHAPE (Rock)

Roughness	Description	Roughness	Description
SM	Smooth	PO	Polished
RF	Rough	SL	Slickensided
VR	Very Rough		

Shape	Description	Shape	Description
PR	Planar	CU	Curved
UN	Undulating	ST	Stepped
IR	Irregular		

DEFECT APERTURE OBSERVATION (Rock)

Symbol	Term
CN	Clean
CT	Coating (<=1 mm)
SN	Stained
VN	Veneer

Aperture infill is denoted through presence of a value in the aperture thickness measurement and an infill material code or name in the infill material cell.

DEFECT INFILLING (Rock)

Where defects are infilled, the infilling material is either coded with a soil/mineral name (e.g. CLAY), a group symbol code (e.g. SC), or one of the material codes in the table below.

Term	Description	Term	Description
Ca	Calcite	Mn	Manganese
Ch	Chlorite	Py	Pyrite
Co	Coal/carbonaceous	Gp	Gypsum
CR	Crushed rock	Qz	Quartz
Fe	Limonite/ironstone	Ud	Unidentified
Fs	Feldspar		

OTHER OBSERVATIONS

Ranking of visually observable contamination and odour (applies on specific soil contamination projects only)

Symbol	Term
R = 0	No visible evidence of contamination
R = 1	Slight evidence of contamination
R = 2	Visible evidence of contamination
R = 3	Significant visible evidence of contamination
R = A	No non-natural odours identified
R = B	Slight non-natural odours identified
R = C	Moderate non-natural odours identified
R = D	Strong non-natural odours identified

Graphic Log Colour Scheme – Soils and Rocks

The soil and rock colour schemes presented on the logs and fences have been derived from those below.

The rock colour scheme is taken from Geoscience Australia's predecessor, the Bureau of Mineral Resources (BMR).

	Clay dominated soils	Soils
	Silt dominated soils, topsoil, undifferentiated fine grained soil	
	Sand dominated soils	
	Gravel or cobble dominated soils	
	Peat soils	Sedimentary rocks
	Lithic sedimentary breccia and conglomerate	
	Sandstone, arenite	
	Arkose	
	Pelitic rocks, shale, mudstone	
	Greywacke, siltstone, siltstone-sandstone mixtures	
	Coal, lignite, undifferentiated carbonaceous rock	Metamorphic rocks
	Limestone, chert, undifferentiated calcareous soils, and rocks	
	Undifferentiated metamorphic rocks of any grade	
	Schist, gneiss, and other high grade metamorphic rocks	
	Greenschist, phyllite, hornfels and lower grade metamorphic rocks	Igneous rocks
	Undifferentiated igneous rock, tuff, volcanics	
	Extrusive acid igneous rock, rhyolite	
	Extrusive basic igneous rock, basalt, spilite	
	Extrusive intermediate igneous rock, dacite	
	Extrusive ultrabasic igneous	
	Intrusive acid igneous rock, all granitoid rock	
	Intrusive basic igneous rock, gabbro, dolerite	
	Intrusive intermediate igneous rock, andesite, diorite	Secondary rock, man-made and other materials
	Intrusive ultrabasic igneous rock, peridotite	
	Fill, concrete, pavement	
	Water	
	Undifferentiated evaporite unit	
	Calcrete	
	Ironstone, ferricrete, ferruginous rock	

Graphic Symbols – Soils and Rocks

Typical symbols for soils and rocks are as follows. Combinations of these symbols may be used to indicate mixed materials such as clayey sand.

SOIL SYMBOLS

Main components



CLAY



SILT



SAND



GRAVEL



BOULDERS / COBBLES



TOPSOIL



PEAT

Minor components



CLAYEY



SILTY



SANDY



GRAVELLY

OTHER MATERIAL SYMBOLS



FILL



BITUMEN



CONCRETE

ROCK SYMBOLS

Sedimentary Rocks



SANDSTONE



SILTSTONE



CLAYSTONE, MUDSTONE



SHALE



COAL



LIMESTONE



CONGLOMERATE

Igneous rocks



GRANITE



BASALT



UNDIFFERENTIATED IGNEOUS

Metamorphic rocks



SLATE, PHYLLITE, SCHIST



GNEISS



QUARTZITE



CGF-TP004 - 1 Sidewall



CGF-TP004 - 2 Spoil



TITLE

Volt Advisory Group Pty Ltd
Daintree
Daintree Renewable Microgrid
Photo - CGF-TP004

1	DRAWING
---	---------

NLP

DATE

28/02/2023

25/25

	DATE
--	------

28/2/2023

SCALE

Not To Scale

A4

PROJECT No. _____

PS135008

FIGURE No.

1/2



CGF-TP004 - 3 Sidewall



CGF-TP004 - 4 After



TITLE

Volt Advisory Group Pty Ltd
Daintree
Daintree Renewable Microgrid
Photo - CGF-TP004

DRAWN

NLP

DATE

28/02/2023

CHECKED

DATE

28/2/2023

SCALE

Not To Scale

A4

PROJECT No

PS135008

FIGURE No

2/2




CGF-TP006 - 1 Sidewall



CGF-TP006 - 2 Spoll

	TITLE Volt Advisory Group Pty Ltd Daintree Daintree Renewable Microgrid Photo - CGF-TP006	DRAWN NLP		DATE 28/02/2023	
		CHECKED		DATE 28/2/2023	
		SCALE Not To Scale			A4
		PROJECT No PS135008		FIGURE No 1/2	



	TITLE Volt Advisory Group Pty Ltd Daintree Daintree Renewable Microgrid Photo - CGF-TP006	DRAWN NLP		DATE 28/02/2023	
		CHECKED		DATE 28/2/2023	
		SCALE Not To Scale			A4
		PROJECT No PS135008		FIGURE No 2/2	



CGF-TP007 - 3 Sidewall



CGF-TP007 - 4 After

	<p>TITLE</p> <p>Volt Advisory Group Pty Ltd Daintree Daintree Renewable Microgrid Photo - CGF-TP007</p>	DRAWN	NLP	DATE	28/02/2023
		CHECKED		DATE	28/2/2023
		SCALE	Not To Scale		A4
		PROJECT No	PS135008	FIGURE No	2/2



	TITLE Volt Advisory Group Pty Ltd Daintree Daintree Renewable Microgrid Photo - CGF-TP008	DRAWN	NLP	DATE	28/02/2023	
		CHECKED		DATE	28/2/2023	
		SCALE			Not To Scale	A4
		PROJECT No		FIGURE No		
		PS135008		2/2		



	TITLE Volt Advisory Group Pty Ltd Daintree Daintree Renewable Microgrid Photo - CGF-TP009	DRAWN NLP		DATE 28/02/2023	
		CHECKED		DATE 28/2/2023	
		SCALE Not To Scale			A4
		PROJECT No PS135008		FIGURE No 2/2	

Explanatory Notes - Engineering Logs

Engineering logs have been prepared in accordance with AS1726:2017 "Geotechnical Site Investigations" and as defined below.

DRILLING/EXCAVATION METHODS

Symbol	Term
AS	Auger Screwing
EX	Excavation
HA	Hand Auger
NMLC/HMLC	Diamond Core - triple tube
NQ/HQ/PQ	Diamond Core - wireline
PC	Percussion
PCB	Poly Carbonized Diamond Bit
PT	Push Tube
RAB	Rotary Air Blast
RC	Reverse Circulation
S	Sonic drill
VB	Vibrocoring
WB	Washbore with blade
WR	Washbore with roller (tricone)

SUPPORT

C	Casing
M	Drill mud
Nil	No support

WATER

Partial water loss > Water inflow

Complete water loss

Water level at date shown

NFGWO No Free Groundwater Observed

The observation of groundwater, whether present or not, was not possible due to drilling water, surface seepage or cave in of the borehole/test pit.

NFGWE No Free Groundwater Encountered

The borehole/test pit was dry soon after excavation. Inflow may have been observed had the borehole/test pit been left open for a longer period.

FIELD TEST (Soil borehole and test pit logs)

DM	Dilatometer test
HB	Hammer bounce
OT	Other test (eg. plate load test)
PE	Permeability test
PM	Pressuremeter test
PP	Pocket penetrometer
SPT	Standard penetration test
SV	Shear vane test

SAMPLE (Soil borehole and test pit logs)

B	Bulk disturbed sample
D	Disturbed sample
PT	Push tube
SPT	SPT sample
U50	Undisturbed sample in 50mm diameter tube
U75	Undisturbed sample in 75mm diameter tube

GRAPHIC LOG – see later

TOTAL CORE RECOVERY (Rock logs only)

$$TCR (\%) = \frac{\text{Length of core recovered}}{\text{Length of core run}} \times 100$$

ROCK QUALITY DESIGNATION (Rock logs only)

$$RQD (\%) = \frac{\text{Length of sound core pieces} > 100\text{mm}}{\text{Length of core run}} \times 100$$

GROUP SYMBOL (Soil borehole and test pit logs)

Soils are classified to reflect their primary and significant secondary component/characteristic using the classification symbols described in AS1726-2017, summarised as follows.

Symbol	Major division	Typical names
GW, GP	GRAVEL	Gravel & gravel-sand mixtures, little/no fines
GM		Gravel-silt & gravel-sand-silt mixtures
GC		Gravel-clay & gravel-sand-clay mixtures
SW, SP	SAND	Sand & gravel-sand mixtures, little/no
SM		Sand-silt mixtures
SC		Sand-clay mixtures
ML	SILT & CLAY (low & medium plasticity)	Inorganic silt/clayey fine sand or silt
CL, CI		Inorganic clay, gravelly clay, sandy clay
OL		Organic silt
MH	SILT & CLAY (high plasticity)	Inorganic silt
CH		Inorganic clay, high plasticity
OH		Organic clay, med-high plasticity, organic silt
Pt	Highly organic soil	Peat, highly organic soil

FIELD DESCRIPTION

Soil and rock materials described to AS1726-2017. The description of percentage of cobbles and boulders in a soil may be limited by sample size.

MOISTURE CONDITION

Coarse grained soils and rocks

Dry (D), Moist (M) or Wet (W).

Estimated based on appearance and feel.

Cohesive soils

MC<PL	Moist, dry of plastic limit
MC=PL	Moist, near plastic limit
MC>PL	Moist, wet of plastic limit
MC=LL	Wet, near liquid limit
MC>LL	Wet, wet of liquid limit

Estimated based on judgement

COHESIVE SOILS - CONSISTENCY

The consistency of a cohesive soil is assessed by tactile means or field measurement of undrained shear strength.

A Hand Penetrometer may be used in the field or the laboratory to provide approximate assessment of unconfined compressive strength of cohesive soils (kPa) as follows:

Strength	Symbol	Indicative undrained shear strength (kPa)	Hand Penetrometer Reading (kPa)
Very Soft	VS	≤ 12	< 25
Soft	S	> 12 and ≤ 25	25 to 50
Firm	F	> 25 and ≤ 50	50 to 100
Stiff	St	> 50 and ≤ 100	100 to 200
Very Stiff	VSt	> 100 and ≤ 200	200 to 400
Hard	H	> 200	> 400
Friable	Fr	-	-

COHESIONLESS SOILS - RELATIVE DENSITY

Relative density terms are used to describe silty and sandy material, and these are usually based on resistance to drilling penetration or the Standard Penetration Test (SPT) 'N' values.

The Standard Penetration Test (SPT) is carried out in accordance with AS 1289, 6.3.1. For completed tests the number of blows required to drive the split spoon sampler 300 mm is recorded as the N value. For incomplete tests the number of blows and the penetration beyond the seating depth of 150 mm are recorded. If the 150 mm seating penetration is not achieved the number of blows to achieve the measured penetration is recorded. SPT correlations may be subject to corrections for overburden pressure and equipment type.

Term	Symbol	Density Index	N Value (blows /0.3 m)	DCP (blows /100mm)
Very Loose	VL	0 to 15	0 to 4	0 to 1
Loose	L	15 to 35	4 to 10	1 to 2
Medium Dense	MD	35 to 65	10 to 30	2 to 5
Dense	D	65 to 85	30 to 50	5 to 10
Very Dense	VD	>85	>50	>10

SOIL STRUCTURE

Soil structure is described to AS 1726-2017 if visible and present.

SOIL / ROCK ORIGIN

The geological origin of the soil or rock is presented as an interpretation of the geological and geomorphological setting. Origin cannot be deduced on the basis of material appearance and properties alone and is therefore limited by the availability of supporting geological information.

ROCK MATERIAL WEATHERING

Rock weathering is described mainly using the following abbreviations and definitions used in AS1726.

Term	Symbol	Definition
Residual soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognizable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	Rock shows no sign of decomposition of individual minerals or colour changes.

If differentiation between highly and moderately weathered rock is not practicable, then Distinctly Weathered (DW) is used as defined in AS1726:2017.

INFERRED ROCK STRENGTH

Rock strength is Inferred based on field assessment, Point Load Index or Uniaxial Compressive Strength as follows:

Term	Symbol	UCS (MPa)	Point Load Index: $I_{oc}(s)$ (MPa)
Very Low	VL	0.5 to 2	0.03 to 0.1
Low	L	2 to 6	0.1 to 0.3
Medium	M	6 to 20	0.3 to 1
High	H	20 to 60	1 to 3
Very High	VH	60 to 200	3 to 10
Extremely High	EH	>200	>10

- Diametral Point Load Index test
- Axial Point Load Index test
- ◆ Uniaxial Compressive Strength test

strength test data is indicated on a dual PI/UCS column due to space constraints only. No correlation between the two values is to be inferred.

DEFECT SPACING/BEDDING SPACING (Rock)

Measured at right angles to defects of same set or bedding.

Term	Defect Spacing	Bedding
Extremely closely spaced	<6 mm 6 to 20 mm	Thinly Laminated Laminated
Very closely spaced	20 to 60 mm	Very Thin
Closely spaced	0.06 to 0.2 m	Thin
Moderately widely spaced	0.2 to 0.6 m	Medium
Widely spaced	0.6 to 2 m	Thick
Very widely spaced	>2 m	Very Thick

DEFECT DESCRIPTION (Rock)

Symbol	Term	Symbol	Term
Bg	Bedding	DB	Drill Break
Pt	Parting	Se	Seam
Cn	Contact	SZ	Sheared Zone
Bd	Boundary	CZ	Crushed Zone
Jt	Joint	F	Fault
Fo	Foliation	Vn	Vein
C	Cleavage		

DEFECT ORIENTATION (Rock)

Dip measured relative to the horizontal plane in vertical boreholes and relative to core axis in inclined boreholes.

DEFECT ROUGHNESS AND SHAPE (Rock)

Roughness	Description	Roughness	Description
Sm	Smooth	Po	Polished
Ro	Rough	Sl	Slickensided
VRo	Very Rough		
Shape	Description	Shape	Description
Pl	Planar	Cu	Curved
Un	Undulating	Vu	Vuggy
Ir	Irregular	St	Stepped

COATING OR INFILLING (Rock)








Abbreviation	Description	Abbreviation	Description
Cin	Clean	Co	Coal
Cg	Coating	Cr	Crushed rock
In	infill	Fe	Iron ore/ironstone
Sn	Stain	Fl	Feldspar
Vr	Veneer	Gp	Gypsum
Ca	Calcite	Mn	Manganese
Ch	Chlorite	Fy	Pyrite
Cl	Clay	Qz	Quartz

Graphic Symbols — Soils and Rocks





Typical symbols for soils and rocks are as follows. Combinations of these symbols may be used to indicate mixed materials such as clayey sand.

SOIL SYMBOLS

Main components

	CLAY
	SILT
	SAND
	GRAVEL
	BOULDERS / COBBLES
	TOPSOIL
	PEAT

Minor components








	CLAYEY
	SILTY
	SANDY
	GRAVELLY

OTHER MATERIAL SYMBOLS




	FILL
	BITUMEN
	CONCRETE

ROCK SYMBOLS


Sedimentary Rocks

	SANDSTONE
	SILTSTONE
	CLAYSTONE, MUDSTONE
	SHALE
	COAL
	LIMESTONE
	CONGLOMERATE

Igneous rocks

	GRANITE
	BASALT
	UNDIFFERENTIATED IGNEOUS

Metamorphic rocks

	SLATE, PHYLLITE, SCHIST
	GNEISS
	QUARTZITE

Appendix E

Laboratory test reports



Soils testing - Particle size distribution & consistency limits test report

Standard method (by sieving)

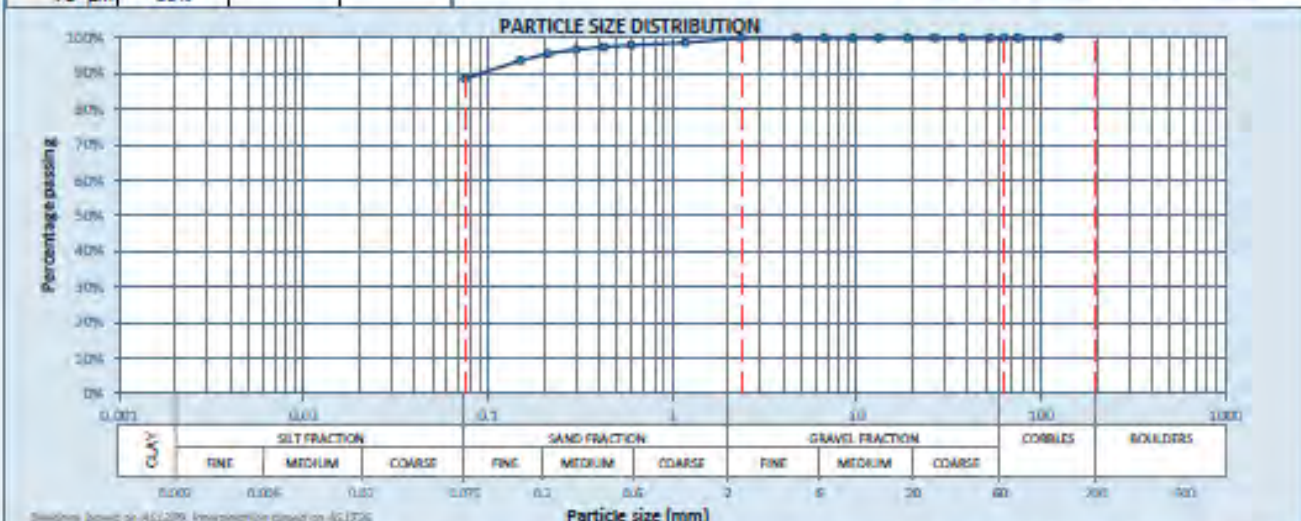
AS1289.3.6.1, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1 & AS 1726:2017 Section 6.1



Test request #:	STRM23-0069	Specimen ID:	LMEL2023012528	Golder Associates Pty Ltd
Client:	Volt Advisory Group Pty Ltd			MELBOURNE GEOTECHNICAL LABORATORY
Client address:	Level 7, 757 Ann Street, Fortitude Valley QLD 4006			Building 7, Botanica Corporate Park 570 - 588 Swan Street Richmond, Victoria 3121
Project ID:	PS135008	Exploratory Hole:	CGF-BH003	Sample depth (m): 1.50 - 1.95
Project name:	Daintree Renewable Microgrid			Client sample ref:
Project reference:	Loc. ref.: Geotechnical investigation for CGF, HDD, and UO			

Specimen description:				Sampling: Tested as received			
PARTICLE SIZE DISTRIBUTION AS 1289.3.6.1				Easting (m) Northing (m) Level (m)			
Sieve Size	Passing	LB S	UB S	(MM), SILT, high plasticity, red brown, trace fine to coarse sand			
125 mm	100%			Method:	AS 1289.2.1.1	AS 1289.2.1.2	AS 1289.2.1.3
75 mm	100%			Moisture content	1 point	Plastic limit	Plasticity index
63 mm	100%			Liquid limit			Linear shrinkage
53 mm	100%			Result:	37.8%	66%	33%
37.5 mm	100%			As Rcvd.			Cracking
26.5 mm	100%			LB S:			
19 mm	100%			UB S:			
13.2 mm	100%			Att. preparation method:	Dry sieved	LSM length (mm):	254
9.5 mm	100%			Specimen history/notes:			
6.7 mm	100%			Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK			
4.75 mm	100%			Preparation of specimen and testing performed on sample supplied to the laboratory			
2.36 mm	100%			Definitions:			
1.18 mm	99%			LB S = Lower bound specification N/A = Not applicable			
600 µm	98%			LSM = Linear shrinkage mould ND = Not determined; S/B = Slip in bowl			
425 µm	97%			UB S = Upper bound specification NO = Not obtainable; NP = Non plastic			
300 µm	97%			GRADING SUMMARY			
212 µm	96%			Fines	Sand*	Gravel*	Cobbles*
150 µm	94%			(<75 µm)	(>75 µm - <2.36 mm)	(>2.36 mm - <63 mm)	(>63mm - <200 mm)
75 µm	89%			88.6%	11.4%	0.0%	0.0%

*Proportions based on guidance in AS1726:2017 Section 6.1.4.2



Testing by:	PL	Dates:	10/02/23 - 11/02/23	Results reviewed by:	ASTevenson	Date reported:	21/02/2023
Cert. ref.:	PS135008_CGF-BH003_STRM23-0069_PSD_23012528_Rep23091954						Approved signatory:
	NATA accreditation number: 1961 - Site:1250 - Melbourne						
	Accredited for compliance with ISO/IEC 17025 - Testing						
THIS DOCUMENT SHALL ONLY BE REPRODUCED IN FULL (Sheet 1 of 1)						Aaron Stevenson - Senior Technician	
Phone: +61 (03) 8862 3500		Fax: +61 (03) 8862 3501		E-mail: melbourne@wsp.com		Web: www.golder.com.au	

These tests were carried out in accordance with the Australian standards identified in this certificate.
Test results relate only to the sample(s) tested.

Rep AS1289.3.6.1 - 01/01

Soils testing - Particle size distribution & consistency limits test report

Standard method (by sieving)

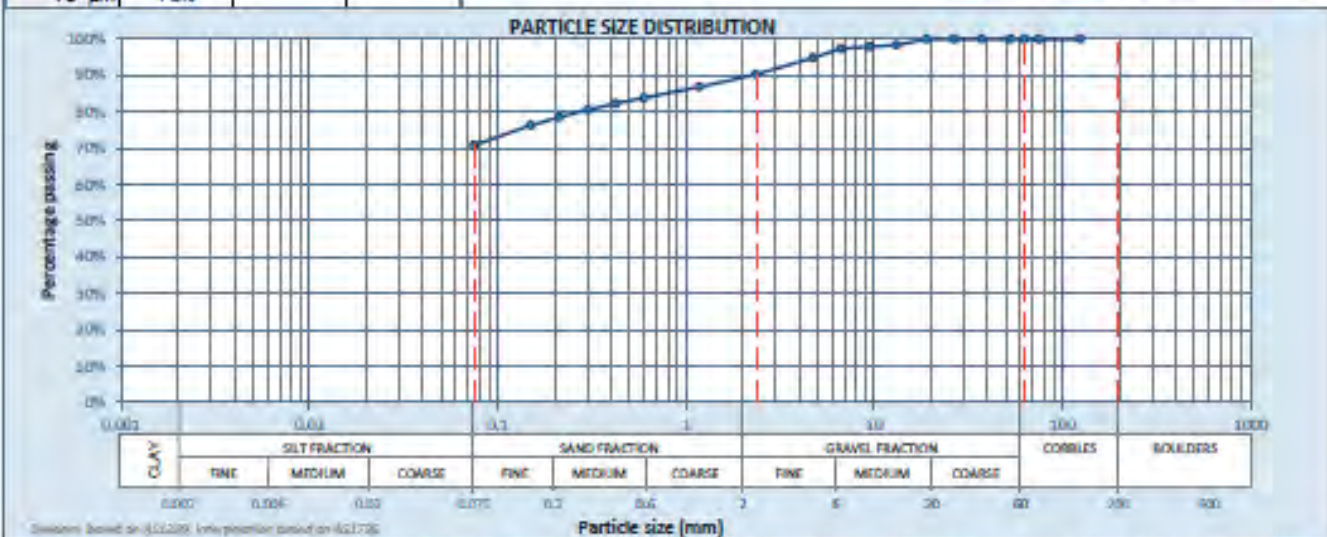
AS1289.3.6.1, 2.1.1, 3.1.2, 3.2.1, 3.3.1, 3.4.1 & AS 1726:2017 Section 6.1



Test request #:	STRM23-0069	Specimen ID:	LMEL2023012529	Golder Associates Pty Ltd
Client:	Volt Advisory Group Pty Ltd			MELBOURNE GEOTECHNICAL LABORATORY
Client address:	Level 7, 757 Ann Street, Fortitude Valley QLD 4006			Building 7, Botanica Corporate Park 570 - 588 Swan Street Richmond, Victoria 3121
Project ID:	PS135008	Exploratory Hole	CGF-BH004	Sample depth (m): 0.50 - 0.95
Project name:	Daintree Renewable Microgrid	Client sample ref:		
Project reference:	Loc. ref.: Geotechnical investigation for CGF, HDD, and UCL			

Specimen description:				[AS 1726:2017 Section 6.1]				Sampling: Tested as received									
PARTICLE SIZE DISTRIBUTION AS 1289.3.6.1				(MFL) SILT, high plasticity, red brown, with fine to coarse grained sand, trace fine to medium gravel				Easting (m)		Northing (m)	Level (m)						
Sieve Size		Passing		LB 5		UB 5											
125 mm	100%					Method:		AS 1289.3.1.1		AS 1289.3.1.2		AS 1289.3.1.3		AS 1289.3.1.4		AS 1289.3.4.1	
75 mm	100%						Moisture content	1 point Liquid limit	Plastic limit	Plasticity index	Linear shrinkage	Curling/ Crumpling/ Cracking					
63 mm	100%					Result:	26.8% As Rcvd.	57%	32%	25%	15.0%	Cracking					
53 mm	100%					LB 5:							-				
37.5 mm	100%					UB 5:							-				
26.5 mm	100%					Att. preparation method:		Dry sieved		LSM length (mm):		250					
19 mm	100%					Specimen history/notes:	Compliance check AS 1289.1.1 - Clause 5.7 - Table 1 - OK										
13.2 mm	98%						Preparation of specimen and testing performed on sample supplied to the laboratory										
9.5 mm	98%					Definitions:	LB 5 = Lower bound specification				N/A = Not applicable						
6.7 mm	97%						LSM = Linear shrinkage mould				ND = Not determined; SIB = Slip in bowl						
4.75 mm	95%					UB 5 = Upper bound specification				NO = Not obtainable; NP = Non plastic							
2.36 mm	90%					GRADING SUMMARY											
1.18 mm	87%																
600 µm	84%					Fines	Sand*		Gravel*		Cobbles*						
425 µm	82%					(<75 µm)	>75 µm - <2.36 mm		>2.36 mm - <63 mm		>63mm - <200 mm						
300 µm	81%			70.8%	19.5%		9.7%		0.0%								
212 µm	79%			*Proportions based on guidance in AS1726-2017 Section 6.1.4.2													
150 µm	76%																
75 µm	71%																

*Proportions based on guidance in AS1726:2017 Section 6.1.4.2



Testing by: PL Dates: 10/02/23 - 11/02/23 Results reviewed by: AStevenson Date reported: 21/02/2023

Cert. ref.: PS135008_CGF-BH004_STRM23-0069_PSD_23012529_Rep23091955	Approved signatory:
NATA accreditation number: 1961 - Site:1250 - Melbourne Accredited for compliance with ISO/IEC 17025 - Testing	
THIS DOCUMENT SHALL ONLY BE REPRODUCED IN FULL (Sheet 1 of 1)	Aaron Stevenson - Senior Technician

Phone: +61 (03) 8862 3500 Fax: +61 (03) 8862 3501 E-mail: melbourne@wspgolder.com Web: www.wspgolder.com.au

These tests were carried out in accordance with the Australian standards identified in this certificate.

Rep AS1289.3.6.1 - 01.01

MOISTURE CONTENT REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45006-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 1 of 2

Test Procedures:	AS1289.2.1.1			
Sample Number	11512/S/117217	11512/S/117218	11512/S/117219	11512/S/117220
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Sampled	30/01/2023	30/01/2023	30/01/2023	30/01/2023
Sampling Method	Tested As Received	Tested As Received	Tested As Received	Tested As Received
Sampled By	Client Sampled	Client Sampled	Client Sampled	Client Sampled
Tested By	Kirin Clarke-Tinson	Kirin Clarke-Tinson	Kirin Clarke-Tinson	Kirin Clarke-Tinson
Date Tested	31/01/2023	31/01/2023	31/01/2023	31/01/2023
Material Source	-	-	-	-
Material Type	-	-	-	-
Location ID	CGF-BH001	CGF-BH002	CGF-BH005	CGF-BH006
Sample Depth From (	1.5	4.5	4.5	7.5
Sample Depth To (m)	1.95	4.95	4.95	7.95
Sample Type	D	D	D	D
Moisture Content (%)	40.4	35.6	27.6	26.4

Sample Number	11512/S/117221	11512/S/117222	11512/S/117223	11512/S/117224
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Sampled	30/01/2023	30/01/2023	30/01/2023	30/01/2023
Sampling Method	Tested As Received	Tested As Received	Tested As Received	Tested As Received
Sampled By	Client Sampled	Client Sampled	Client Sampled	Client Sampled
Tested By	Kirin Clarke-Tinson	Kirin Clarke-Tinson	Kirin Clarke-Tinson	Kirin Clarke-Tinson
Date Tested	31/01/2023	31/01/2023	31/01/2023	31/01/2023
Material Source	-	-	-	-
Material Type	-	-	-	-
Location ID	CGF-BH007	CGF-BH008	CGF-BH009	CGF-TP003
Sample Depth From (	6	1.5	3	0.5
Sample Depth To (m)	6.45	1.95	3.45	0.6
Sample Type	D	D	D	B
Moisture Content (%)	25.4	31.8	28.5	35.3

Remarks	Results apply to the sample/s as received.
---------	--------------------------------------------

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986 Corporate Site Number: 11512</p>		 <p>Approved Signatory: Craig Wilson Form ID: W20Rep Rev 3</p>
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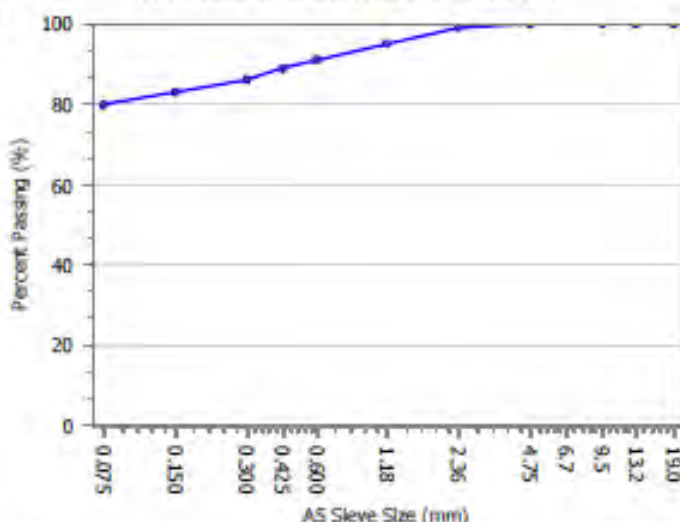
QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 1 of 11

Test Procedures	AS1289.3.5.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117217	Location ID	CGF-BH001
Sampling Method	Tested As Received	Sample Depth From (	1.5
Date Sampled	30/01/2023	Sample Depth To (m)	1.95
Sampled By	Client Sampled	Sample Type	D
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	CH Clay, high plasticity, with sand, trace of gravel		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		100	
4.75		100	
2.36		99	
1.18		95	
0.600		91	
0.425		89	
0.300		86	
0.150		83	
0.075		80	

PARTICLE SIZE DISTRIBUTION GRAPH



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		64		0.075/0.425 Fines Ratio		0.90	
Plastic Limit (%)		31		PI x 0.425 Ratio (%)		2927.1	
Plastic Index (%)		33		LS x 0.425 Ratio (%)		1330.5	
Linear Shrinkage (%)		15.0		Linear Shrinkage Defects	Nil		

Remarks	Results apply to the sample/s as received.,
---------	---------------------------------------------



Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: 1986
Corporate Site Number: 11512

Craig Wilson

Approved Signatory: Craig Wilson
Form ID: W85Rep Rev 3



QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 2 of 11

Test Procedures	AS1289.3.6.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117218	Location ID	CGF-BH002
Sampling Method	Tested As Received	Sample Depth From (	4.5
Date Sampled	30/01/2023	Sample Depth To (m)	4.95
Sampled By	Client Sampled	Sample Type	D
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	MH Silt, high plasticity, trace of sand		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		100	
4.75		100	
2.36		100	
1.18		99	
0.600		98	
0.425		98	
0.300		97	
0.150		96	
0.075		94	

PARTICLE SIZE DISTRIBUTION GRAPH

Percent Passing (%)

AS Sieve Size (mm)

Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		74		0.075/0.425 Fines Ratio		0.96	
Plastic Limit (%)		39		PI x 0.425 Ratio (%)		3426.5	
Plastic Index (%)		35		LS x 0.425 Ratio (%)		1321.6	
Linear Shrinkage (%)		13.5		Linear Shrinkage Defects	Cracking		

Remarks	Results apply to the sample/s as received.
---------	--------------------------------------------

<p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 11512</p>		<p><i>Craig Wilson</i></p> <p>Approved Signatory: Craig Wilson</p> <p>Form ID: W85Rep Rev 3</p>
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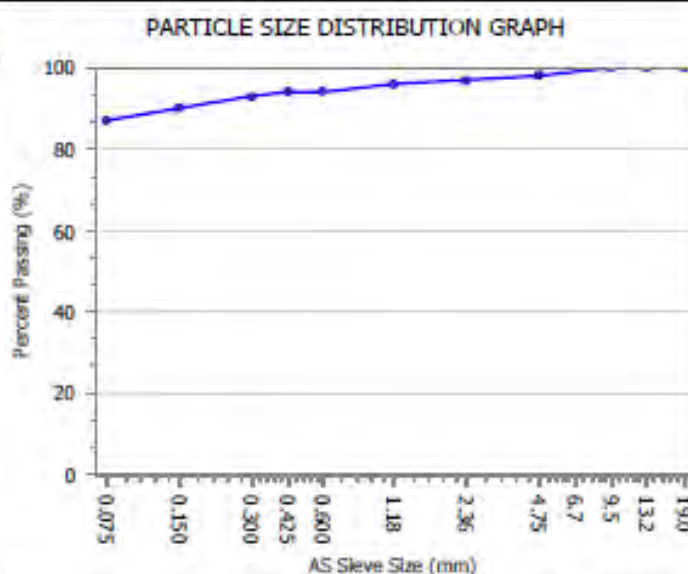


QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 3 of 11



Test Procedures	AS1289.3.6.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS 1289.3.3.1		
Sample Number	11512/S/117219	Location ID	CGF-BH005
Sampling Method	Tested As Received	Sample Depth From (	4.5
Date Sampled	30/01/2023	Sample Depth To (m)	4.95
Sampled By	Client Sampled	Sample Type	D
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	MH Silt, high plasticity, trace of sand, trace of gravel		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		100	
4.75		98	
2.36		97	
1.18		96	
0.600		94	
0.425		94	
0.300		93	
0.150		90	
0.075		87	



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		69		0.075/0.425 Fines Ratio		0.93	
Plastic Limit (%)		35		PI x 0.425 Ratio (%)		3179.0	
Plastic Index (%)		34		LS x 0.425 Ratio (%)		1309.0	
Linear Shrinkage (%)		14.0		Linear Shrinkage Defects	Nil		

Remarks	Results apply to the sample/s as received.
---------	--------------------------------------------

Accredited for compliance with ISO/IEC 17025 – Testing		
		
Accreditation Number:	1986	Approved Signatory: Craig Wilson
Corporate Site Number:	11512	
		Form ID: W85Rep Rev 3



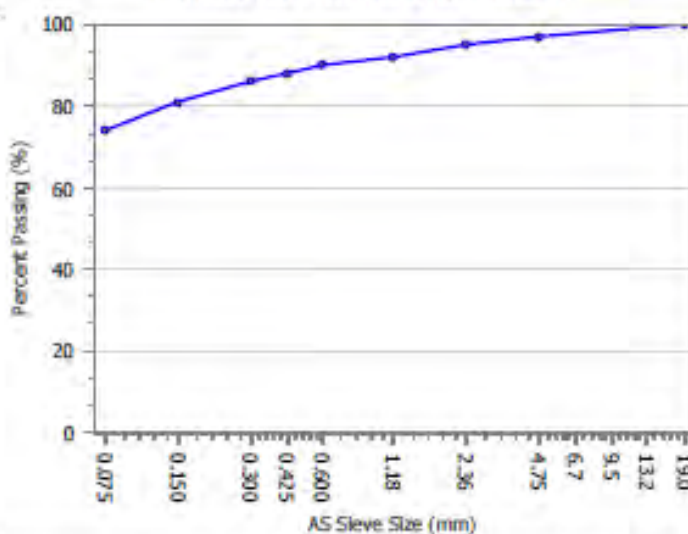
QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 4 of 11

Test Procedures	AS1289.3.6.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS 1289.3.3.1		
Sample Number	11512/S/117220	Location ID	CGF-BH006
Sampling Method	Tested As Received	Sample Depth From (	7.5
Date Sampled	30/01/2023	Sample Depth To (m)	7.95
Sampled By	Client Sampled	Sample Type	D
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	CH Clay, high plasticity, with sand, trace of gravel		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
4.75		97	
2.36		95	
1.18		92	
0.600		90	
0.425		88	
0.300		86	
0.150		81	
0.075		74	

PARTICLE SIZE DISTRIBUTION GRAPH



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		64		0.075/0.425 Fines Ratio		0.85	
Plastic Limit (%)		29		PI x 0.425 Ratio (%)		3062.5	
Plastic Index (%)		35		LS x 0.425 Ratio (%)		1225.0	
Linear Shrinkage (%)		14.0		Linear Shrinkage Defects	Nil		

Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: 1986
Corporate Site Number: 11512

Craig Wilson

Approved Signatory: Craig Wilson
Form ID: W85Rep Rev 3

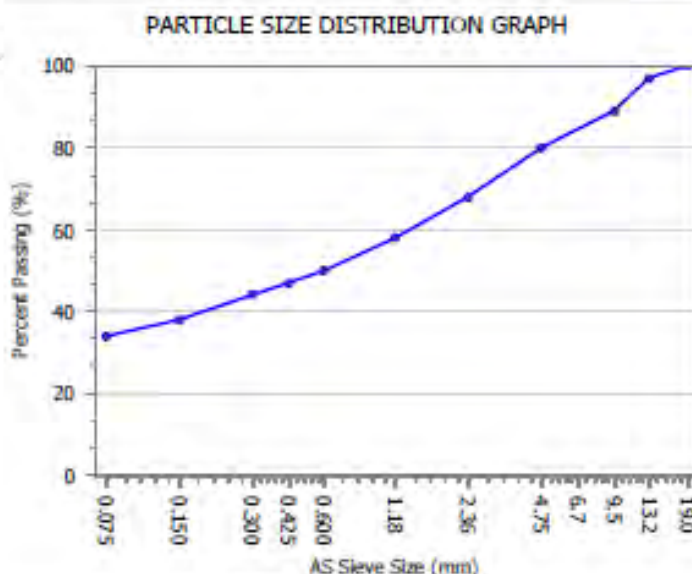


QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	215, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 5 of 11

Test Procedures	AS1289.3.6.1, AS1289.3.12, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117221	Location ID	CGF-BH007
Sampling Method	Tested As Received	Sample Depth From (	6
Date Sampled	30/01/2023	Sample Depth To (m)	6.45
Sampled By	Client Sampled	Sample Type	D
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	SC Gravelly Clayey Sand, high plasticity		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		97	
9.5		89	
4.75		80	
2.36		68	
1.18		58	
0.600		50	
0.425		47	
0.300		44	
0.150		38	
0.075		34	



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		53		0.075/0.425 Fines Ratio		0.73	
Plastic Limit (%)		35		PI x 0.425 Ratio (%)		842.4	
Plastic Index (%)		18		LS x 0.425 Ratio (%)		421.2	
Linear Shrinkage (%)		9.0		Linear Shrinkage Defects		-	

Remarks	Results apply to the sample/s as received.
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Accreditation Number: 1986
Corporate Site Number: 11512

Craig Wilson

Approved Signatory: Craig Wilson

Form ID: W85Rep Rev 3

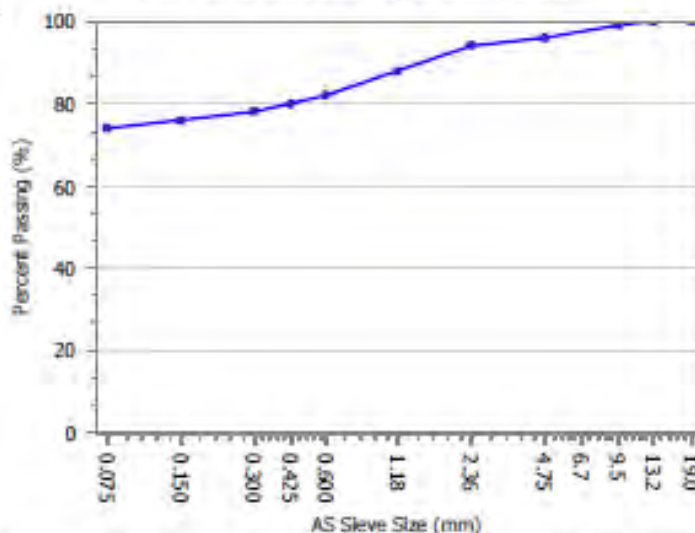
QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 6 of 11

Test Procedures	AS1289.3.5.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117222	Location ID	CGF-BH008
Sampling Method	Tested As Received	Sample Depth From (	1.5
Date Sampled	30/01/2023	Sample Depth To (m)	1.95
Sampled By	Client Sampled	Sample Type	D
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	MH Silt, high plasticity, with sand, trace of gravel		



AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		99	
4.75		96	
2.36		94	
1.18		88	
0.600		82	
0.425		80	
0.300		78	
0.150		76	
0.075		74	

PARTICLE SIZE DISTRIBUTION GRAPH



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		58		0.075/0.425 Fines Ratio		0.92	
Plastic Limit (%)		32		PI x 0.425 Ratio (%)		2077.4	
Plastic Index (%)		26		LS x 0.425 Ratio (%)		1158.6	
Linear Shrinkage (%)		14.5		Linear Shrinkage Defects	Cracking		

Remarks	Results apply to the sample/s as received.
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QUALITY OF MATERIALS REPORT

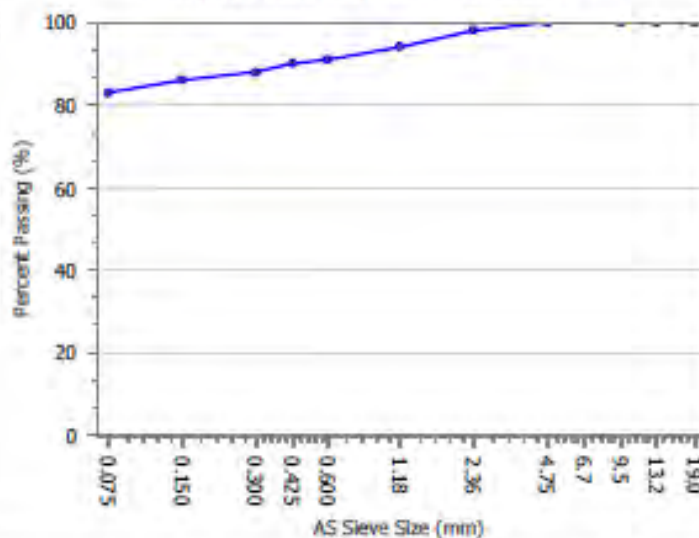
Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 7 of 11

Test Procedures	AS1289.3.6.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117223	Location ID	CGF-BH009
Sampling Method	Tested As Received	Sample Depth From (	3
Date Sampled	30/01/2023	Sample Depth To (m)	3.45
Sampled By	Client Sampled	Sample Type	D
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	

Material Description	MH Silt, high plasticity, trace of sand, trace of gravel
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AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		100	
4.75		100	
2.36		98	
1.18		94	
0.600		91	
0.425		90	
0.300		88	
0.150		86	
0.075		83	

PARTICLE SIZE DISTRIBUTION GRAPH



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		64		0.075/0.425 Fines Ratio		0.92	
Plastic Limit (%)		35		PI x 0.425 Ratio (%)		2598.4	
Plastic Index (%)		29		LS x 0.425 Ratio (%)		1344.0	
Linear Shrinkage (%)		15.0		Linear Shrinkage Defects	Cracking		

Remarks	Results apply to the sample/s as received.
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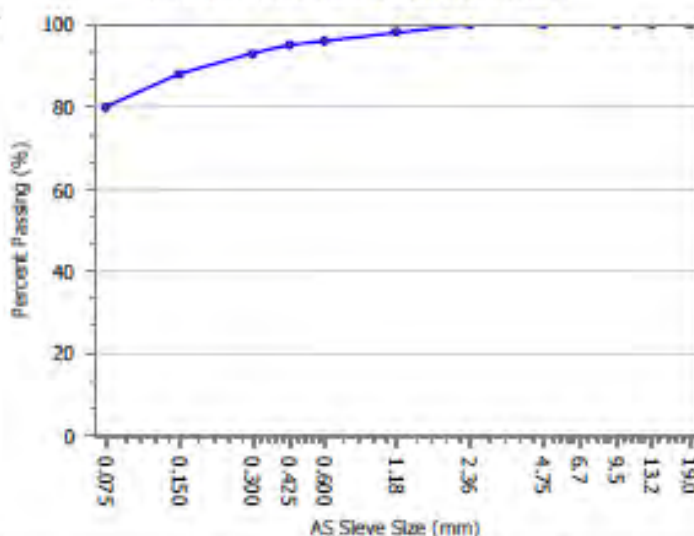
QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 8 of 11

Test Procedures	AS1289.3.6.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117224	Location ID	CGF-TP003
Sampling Method	Tested As Received	Sample Depth From (	0.5
Date Sampled	30/01/2023	Sample Depth To (m)	0.6
Sampled By	Client Sampled	Sample Type	B
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	MH Silt, high plasticity, with sand		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		100	
4.75		100	
2.36		100	
1.18		98	
0.600		96	
0.425		95	
0.300		93	
0.150		88	
0.075		80	

PARTICLE SIZE DISTRIBUTION GRAPH



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		68		0.075/0.425 Fines Ratio		0.85	
Plastic Limit (%)		38		Pl x 0.425 Ratio (%)		2850.0	
Plastic Index (%)		30		LS x 0.425 Ratio (%)		1330.0	
Linear Shrinkage (%)		14.0		Linear Shrinkage Defects	Cracking		

Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 11512

Craig Wilson

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Form ID: W85Rep Rev 3



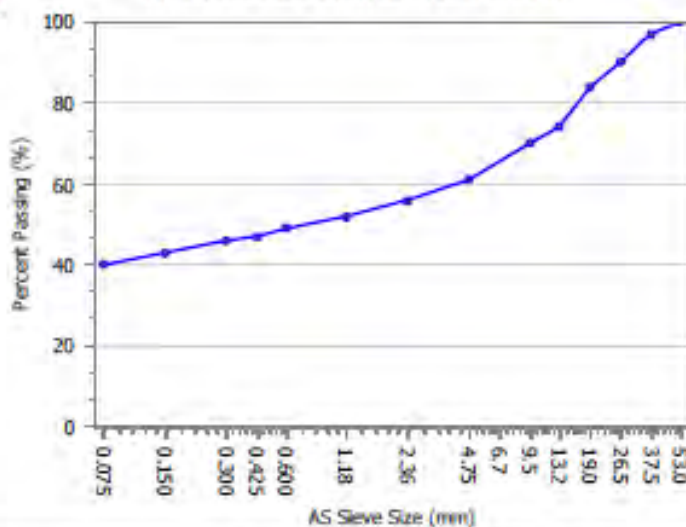
QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 9 of 11

Test Procedures	AS1289.3.5.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117225	Location ID	CGF-TP004
Sampling Method	Tested As Received	Sample Depth From (	0.5
Date Sampled	30/01/2023	Sample Depth To (m)	0.6
Sampled By	Client Sampled	Sample Type	B
Date Tested	2/02/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	MH Gravelly Silt, high plasticity, with sand		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
53.0		100	
37.5		97	
26.5		90	
19.0		84	
13.2		74	
9.5		70	
4.75		61	
2.36		56	
1.18		52	
0.600		49	
0.425		47	
0.300		46	
0.150		43	
0.075		40	

PARTICLE SIZE DISTRIBUTION GRAPH



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		56		0.075/0.425 Fines Ratio		0.85	
Plastic Limit (%)		34		PI x 0.425 Ratio (%)		1039.0	
Plastic Index (%)		22		LS x 0.425 Ratio (%)		519.5	
Linear Shrinkage (%)		11.0		Linear Shrinkage Defects	Cracking		

Remarks	Results apply to the sample/s as received.
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 <p>Accredited for compliance with ISO/IEC 17025 - Testing</p> <p>Accreditation Number: 1986 Corporate Site Number: 11512</p>		 <p>Approved Signatory: Craig Wilson Form ID: W85Rep Rev 3</p>
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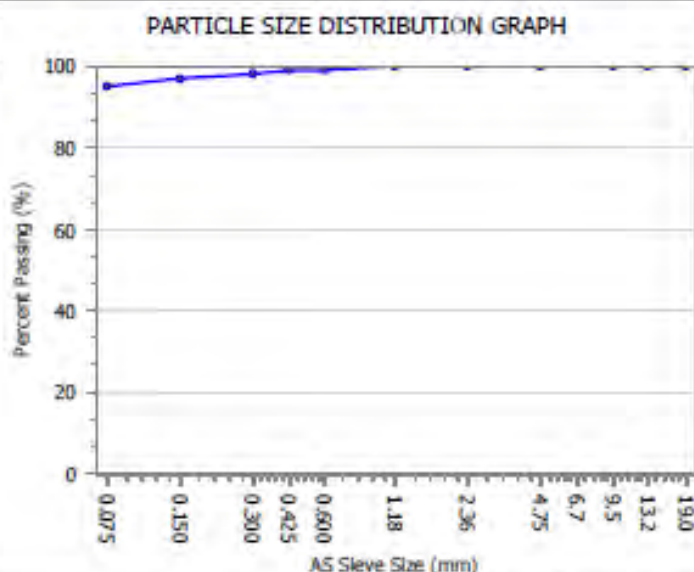


QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 10 of 11

Test Procedures	AS1289.3.6.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117226	Location ID	CGF-TP007
Sampling Method	Tested As Received	Sample Depth From (	0.4
Date Sampled	30/01/2023	Sample Depth To (m)	0.5
Sampled By	Client Sampled	Sample Type	B
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	MH Silt, high plasticity, trace of sand		

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		100	
4.75		100	
2.36		100	
1.18		100	
0.600		99	
0.425		99	
0.300		98	
0.150		97	
0.075		95	



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		74		0.075/0.425 Fines Ratio		0.97	
Plastic Limit (%)		43		PI x 0.425 Ratio (%)		3056.6	
Plastic Index (%)		31		LS x 0.425 Ratio (%)		1479.0	
Linear Shrinkage (%)		15.0		Linear Shrinkage Defects	Cracking		

Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 11512

Craig Wilson

Approved Signatory: Craig Wilson
Form ID: W85Rep Rev 3

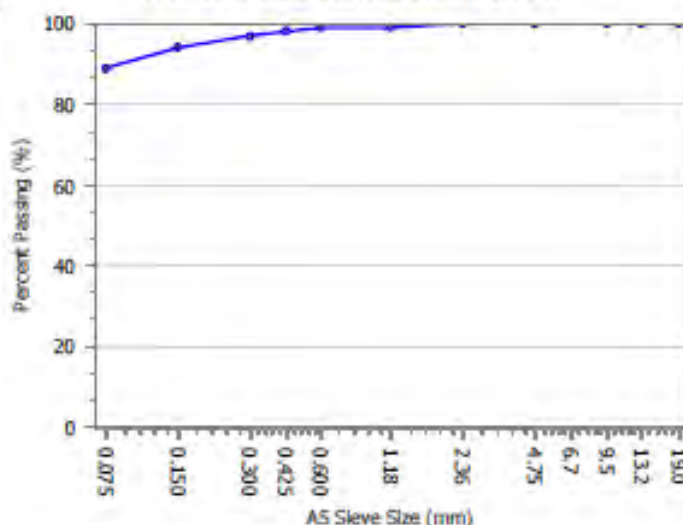
QUALITY OF MATERIALS REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45007-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 11 of 11

Test Procedures	AS1289.3.6.1, AS1289.3.1.2, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1, AS1289.3.3.1		
Sample Number	11512/S/117227	Location ID	CGF-TP009
Sampling Method	Tested As Received	Sample Depth From (	0.5
Date Sampled	30/01/2023	Sample Depth To (m)	0.6
Sampled By	Client Sampled	Sample Type	B
Date Tested	31/01/2023	Material Source	-
PSD Preparation		Material Type	-
Atterberg Preparation	Dry Sieved / Oven Dried	Prep Material > 53.0mm (%)	
Material Description	CI Clay, medium plasticity, trace of sand		

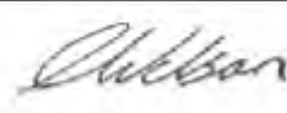

AS Sieve (mm)	Specification Minimum (%)	Percent Passing (%)	Specification Maximum (%)
19.0		100	
13.2		100	
9.5		100	
4.75		100	
2.36		100	
1.18		99	
0.600		99	
0.425		98	
0.300		97	
0.150		94	
0.075		89	

PARTICLE SIZE DISTRIBUTION GRAPH



Test Result	Specification Minimum (%)	Result	Specification Maximum (%)	Test Result	Specification Minimum (%)	Result	Specification Maximum (%)
Liquid Limit (%)		46		0.075/0.425 Fines Ratio		0.91	
Plastic Limit (%)		26		PI x 0.425 Ratio (%)		1962.0	
Plastic Index (%)		20		LS x 0.425 Ratio (%)		1128.2	
Linear Shrinkage (%)		11.5		Linear Shrinkage Defects	Cracking		

Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 - Testing		
	Accreditation Number: 1986 Corporate Site Number: 11512	
		Approved Signatory: Craig Wilson Form ID: W85Rep Rev 3

EMERSON CLASS NUMBER REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45008-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 1 of 1

Test Procedures:	AS1289.3.8.1			
Sample Number	11512/S/117224	11512/S/117225	11512/S/117226	11512/S/117227
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Sampled	30/01/2023	30/01/2023	30/01/2023	30/01/2023
Date Tested	2/02/2023	2/02/2023	2/02/2023	2/02/2023
Material Source	-	-	-	-
Material Type	-	-	-	-
Sampling Method	Tested As Received	Tested As Received	Tested As Received	Tested As Received
Prep Material > 53mm (%)	-	-	-	-
Water Type	Distilled	Distilled	Distilled	Distilled
Water Temperature (°C)	24	25	24	-
Location ID	CGF-TP003	CGF-TP004	CGF-TP007	CGF-TP009
Sample Depth From (	0.5	0.5	0.4	0.5
Sample Depth To (m)	0.6	0.6	0.5	0.6
Sample Type	B	B	B	B
Soil Description	MH Silt, high plasticity, with sand	MH Gravelly Silt, high plasticity, with sand	MH Silt, high plasticity, trace of sand	Cl Clay, medium plasticity, trace of sand
Emerson Class Number	4	4	4	4

Remarks	Results apply to the sample/s as received.
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	Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number:	1986	
	Corporate Site Number:	11512	
	Approved Signatory: Craig Wilson		
	Form ID: W22Rep Rev 3		

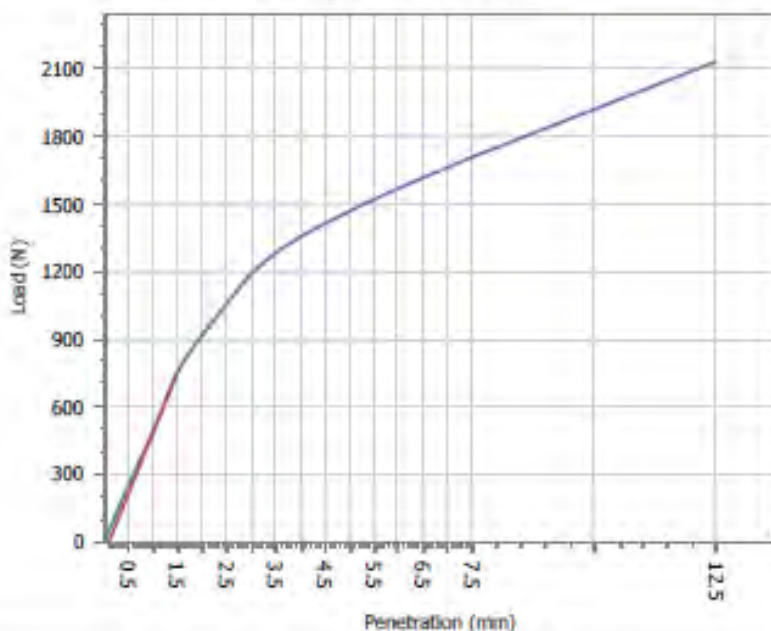
CALIFORNIA BEARING RATIO REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45009-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 1 of 4

Test Procedures	AS1289.6.1.1, AS1289.5.1.1, AS1289.2.1.1		
Sample Number	11512/S/117224	Location ID	CGF-TP003
Sampling Method	Tested As Received	Sample Depth From (	0.5
Date Sampled	30/01/2023	Sample Depth To (m)	0.6
Sampled By	Client Sampled	Sample Type	B
Date Tested	6/02/2023	Prep Material > 53mm (%)	-
Material Source	-	Material Limit Start	-
Material Type	-	Material Limit End	-
Client Reference	-	Compactive Effort	Standard
Material Description	MH Silt, high plasticity, with sand		

Maximum Dry Density (t/m ³):	1.41
Optimum Moisture Content (%):	33.0
Field Moisture Content (%):	35.3
Sample Percent Oversize (%):	0.0
Oversize Included / Excluded	Excluded
Target Density Ratio (%):	95
Target Moisture Ratio (%):	100
Placement Dry Density (t/m ³):	1.34
Placement Dry Density Ratio (%):	95.0
Placement Moisture Content (%):	32.9
Placement Moisture Ratio (%):	100.5
Test Condition / Soaking Period:	Soaked / 4 Days
CBR Surcharge (kg)	4.5
Dry Density After Soak (t/m ³):	1.33
Total Curing Time (hrs)	42
Liquid Limit Method	Estimation
Moisture (top 30mm) After Soak (%)	38.6
Moisture (remainder) After Soak (%)	35.7
CBR Swell (%):	0.5
Minimum CBR Specification (%):	-
CBR Value @ 2.5mm (%):	8

CBR PENETRATION PLOT



Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 11512



Approved Signatory: Craig Wilson
Form ID: W2ASRep Rev 3



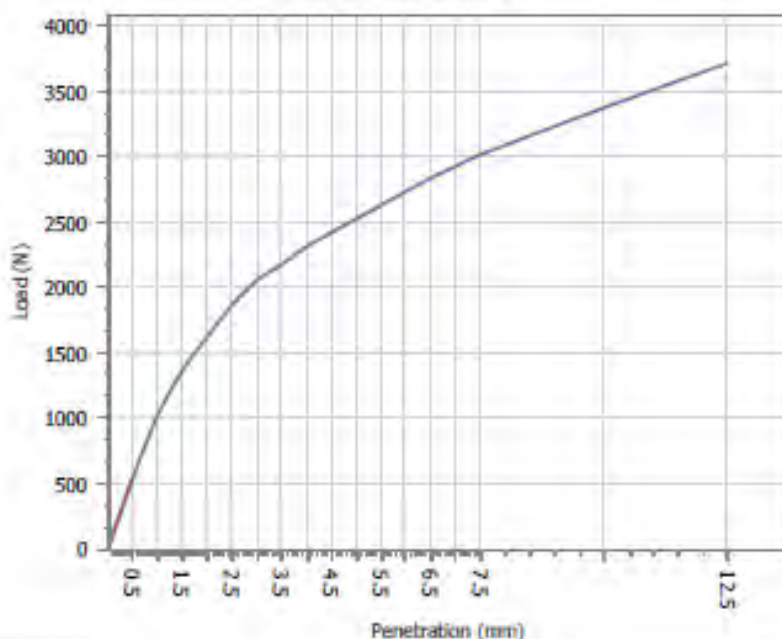
CALIFORNIA BEARING RATIO REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45009-1
Client Address:	215, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 2 of 4

Test Procedures	AS1289.6.1.1, AS1289.5.1.1, AS1289.2.1.1		
Sample Number	11512/S/117225	Location ID	CGF-TP004
Sampling Method	Tested As Received	Sample Depth From (	0.5
Date Sampled	30/01/2023	Sample Depth To (m)	0.6
Sampled By	Client Sampled	Sample Type	B
Date Tested	6/02/2023	Prep Material > 53mm (%)	-
Material Source	-	Material Limit Start	-
Material Type	-	Material Limit End	-
Client Reference	-	Compactive Effort	Standard
Material Description	MH Gravelly Silt, high plasticity, with sand		

Maximum Dry Density (t/m ³):	1.54
Optimum Moisture Content (%):	22.5
Field Moisture Content (%):	28.8
Sample Percent Oversize (%):	13.0
Oversize Included / Excluded	Excluded
Target Density Ratio (%):	95
Target Moisture Ratio (%):	100
Placement Dry Density (t/m ³):	1.55
Placement Dry Density Ratio (%):	94.5
Placement Moisture Content (%):	22.8
Placement Moisture Ratio (%):	101.5
Test Condition / Soaking Period:	Soaked / 4 Days
CBR Surcharge (kg)	4.5
Dry Density After Soak (t/m ³):	1.55
Total Curing Time (hrs)	n/a
Liquid Limit Method	Estimation
Moisture (top 30mm) After Soak (%)	26.2
Moisture (remainder) After Soak (%)	25.5
CBR Swell (%):	0.5
Minimum CBR Specification (%):	-
CBR Value @ 2.5mm (%):	14

CBR PENETRATION PLOT



Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1986
Corporate Site Number: 11512

Craig Wilson

Approved Signatory: Craig Wilson
Form ID: W2ASRep Rev 3

CALIFORNIA BEARING RATIO REPORT

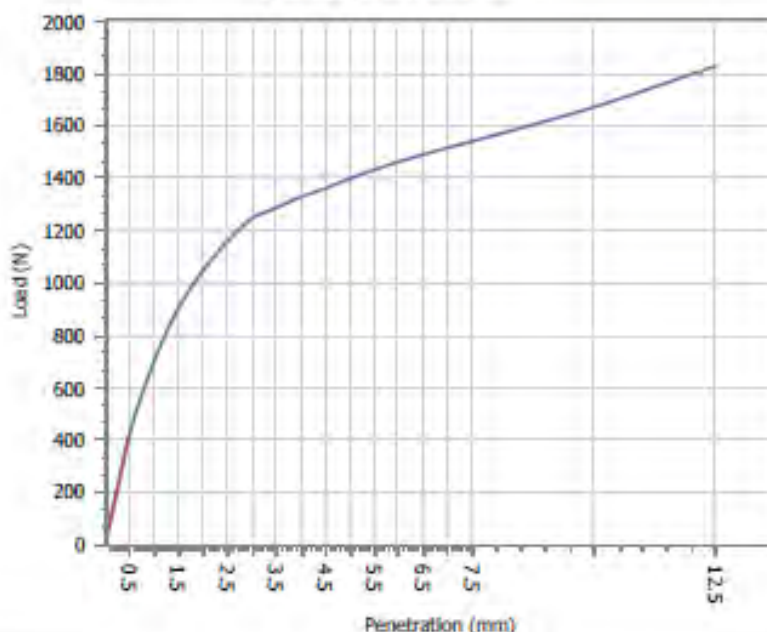
Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45009-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference/s:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 3 of 4

Test Procedures	AS1289.5.1.1, AS1289.5.1.1, AS1289.2.1.1		
Sample Number	11512/S/117226	Location ID	CGF-TP007
Sampling Method	Tested As Received	Sample Depth From (	0.4
Date Sampled	30/01/2023	Sample Depth To (m)	0.5
Sampled By	Client Sampled	Sample Type	B
Date Tested	6/02/2023	Prep Material > 53mm (%)	-
Material Source	-	Material Limit Start	-
Material Type	-	Material Limit End	-
Client Reference	-	Compactive Effort	Standard

Material Description MH Silt, high plasticity, trace of sand

Maximum Dry Density (t/m³):	1.31
Optimum Moisture Content (%):	36.5
Field Moisture Content (%):	38.8
Sample Percent Oversize (%):	0.0
Oversize Included / Excluded	Excluded
Target Density Ratio (%):	95
Target Moisture Ratio (%):	100
Placement Dry Density (t/m³):	1.25
Placement Dry Density Ratio (%):	95.5
Placement Moisture Content (%):	36.3
Placement Moisture Ratio (%):	99.0
Test Condition / Soaking Period:	Soaked / 4 Days
CBR Surcharge (kg)	4.5
Dry Density After Soak (t/m³):	1.24
Total Curing Time (hrs)	42
Liquid Limit Method	Estimation
Moisture (top 30mm) After Soak (%)	40.1
Moisture (remainder) After Soak (%)	39.4
CBR Swell (%):	0.5
Minimum CBR Specification (%):	-
CBR Value @ 2.5mm (%):	9

CBR PENETRATION PLOT



Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: 1986
Corporate Site Number: 11512



Approved Signatory: Craig Wilson
Form ID: W2AS/Rep Rev 3

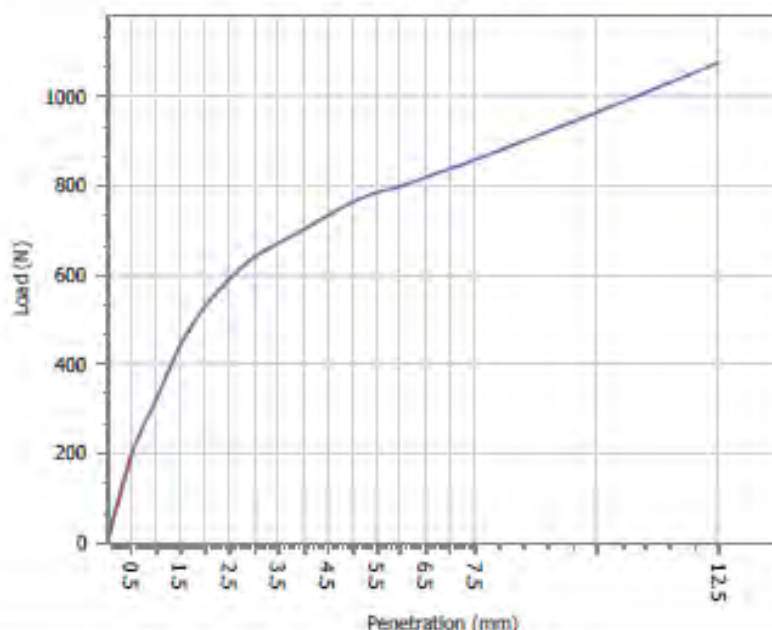
CALIFORNIA BEARING RATIO REPORT

Client:	Golder Associates Pty Ltd	Report Number:	11512/R/45009-1
Client Address:	216, Draper Street, Cairns	Project Number:	11512/P/760
Project:	PS135008 - Daintree Renewable Microgrid	Lot Number:	
Location:	Cairns	Internal Test Request:	11512/T/22257
Component:	Material Testing	Client Reference:	PS135008
Area Description:		Report Date / Page:	8/02/2023 Page 4 of 4

Test Procedures	AS1289.6.1.1, AS1289.5.1.1, AS1289.2.1.1		
Sample Number	11512/S/117227	Location ID	CGF-TP009
Sampling Method	Tested As Received	Sample Depth From (	0.5
Date Sampled	30/01/2023	Sample Depth To (m)	0.6
Sampled By	Client Sampled	Sample Type	B
Date Tested	6/02/2023	Prep Material > 53mm (%)	-
Material Source	-	Material Limit Start	-
Material Type	-	Material Limit End	-
Client Reference	-	Compactive Effort	Standard
Material Description	Cl Clay, medium plasticity, trace of sand		

Maximum Dry Density (t/m³):	1.64
Optimum Moisture Content (%):	21.5
Field Moisture Content (%):	24.3
Sample Percent Oversize (%):	0.0
Oversize Included / Excluded	Excluded
Target Density Ratio (%):	95
Target Moisture Ratio (%):	100
Placement Dry Density (t/m³):	1.56
Placement Dry Density Ratio (%):	95.0
Placement Moisture Content (%):	21.4
Placement Moisture Ratio (%):	99.0
Test Condition / Soaking Period:	Soaked / 4 Days
CBR Surcharge (kg)	4.5
Dry Density After Soak (t/m³):	1.56
Total Curing Time (hrs)	41
Liquid Limit Method	Estimation
Moisture (top 30mm) After Soak (%)	26.2
Moisture (remainder) After Soak (%)	25.6
CBR Swell (%):	0.0
Minimum CBR Specification (%):	-
CBR Value @ 2.5mm (%):	4.5

CBR PENETRATION PLOT



Remarks	Results apply to the sample/s as received.
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Accredited for compliance with ISO/IEC 17025 – Testing

Accreditation Number: 1996
Corporate Site Number: 11512



Approved Signatory: Craig Wilson
Form ID: W2ASRep Rev 3

CLIENT DETAILS

Contact: **Nathan Price**
Client: **WSP AUSTRALIA PTY LIMITED**
Address: **216 Draper Street
Calms
QLD 4870**

Telephone: **0488025782**
Facsimile: **07 3854 6500**
Email: **Nathan.Price@wsp.com**

Project: **P8136008 Daintree Renewable Microgrid**
Order Number: **(Not specified)**
Samples: **37**

LABORATORY DETAILS

Manager: **Anthony Nilsson**
Laboratory: **SGS Calms Environmental**
Address: **Unit 2, 58 Comport St
Portsmith QLD 4870**

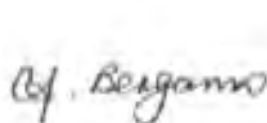
Telephone: **+61 07 4035 5111**
Facsimile: **+61 07 4035 5122**
Email: **AU.Environmental.Calms@sgs.com**

SGS Reference: **CE164237 R0**
Date Received: **24 Jan 2023**
Date Reported: **30 Jan 2023**

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(3146/19038)

SIGNATURES



Alyson BERGAMO
Senior Laboratory Technician



Anthony NILSSON
Operations Manager



Mitsuko BALDWIN
Metals Team Leader

pH	pH Units	-	-	-	-	-
pH _{low}	pH Units	-	-	-	-	-
Reaction Rate (pH/ox)	No unit	-	-	-	-	-
pH Difference	pH Units	-10	-	-	-	-

Sample Number	CE164237.006	CE164237.006	CE164237.007	CE164237.008
Sample Matrix	Soil	Soil	Soil	Soil
Sample Name	HDO-BH003 2.1	HDO-BH003 2.35	HDO-BH003 3.3	HDO-BH003 4.3

Parameter Units LOR

pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	-	-	-	6.8
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Conductivity (1:2) in soil Method: AN108 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	-	-	-	21
Resistivity (1:2)'	ohm cm	-	-	-	-	49000
Resistivity (1:2)''	ohm m	1	-	-	-	490

Chloride (water extractable) Method: AN274 Tested: 30/1/2023

Chloride (water extractable (1:2)	mg/kg	5	-	-	-	8
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 30/1/2023

Sulfur, S	mg/kg	1	-	-	-	<1
Sulfur as Sulfate, SO4	mg/kg	3	-	-	-	<3

Field pH for Acid Sulphate Soil Method: AN104 Tested: 35/1/2023

pH	pH Units	-	6.8	7.0	6.7	6.7
pH _{fix}	pH Units	-	6.7	7.0	6.6	6.6
Reaction Rate (pH _{fix})	No unit	-	1	2	2	1
pH Difference	pH Units	-10	-0.1	0.0	0.1	0.1

Parameter	Units	LOR
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	6.5	-	-	-
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Conductivity (1:2) in soil Method: AN106 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	14	-	-	-
Resistivity (1:2)*	ohm cm	-	70000	-	-	-
Resistivity (1:2)*	ohm m	1	700	-	-	-

Chloride (water extractable) Method: AN274 Tested: 27/1/2023

Chloride (water extractable 1:2)	mg/kg	5	<5	-	-	-
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 27/1/2023

Sulfur, S	mg/kg	1	<1	-	-	-
Sulfur as Sulfate, SO ₄	mg/kg	3	<3	-	-	-

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pH _f	pH Units	-	-	5.3	5.2	5.7
pH _{fox}	pH Units	-	-	5.1	5.0	5.6
Reaction Rate (pH _{fox})	No unit	-	-	2	2	2
pH Difference	pH Units	-10	-	0.2	0.2	0.1



ANALYTICAL REPORT

CE164237 R0

Parameter	Units	LOR	Sample Number Sample Matrix Sample Name	CE164237.013 Soil HDD-BH005 3.25	CE164237.014 Soil HDD-BH006 2.70	CE164237.015 Soil HDD-BH006 4.25	CE164237.016 Soil HDD-BH011 1.2
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	-	-	-	6.4	-
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Conductivity (1:2) in soil Method: AN106 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	-	-	-	11	-
Resistivity (1:2)*	ohm cm	-	-	-	-	94000	-
Resistivity (1:2)*	ohm m	1	-	-	-	940	-

Chloride (water extractable) Method: AN274 Tested: 30/1/2023

Chloride (water extractable 1:2)	mg/kg	5	-	-	-	<5	-
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 30/1/2023

Sulfur, S	mg/kg	1	-	-	-	<1	-
Sulfur as Sulfate, SO ₄	mg/kg	3	-	-	-	<3	-

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pH _f	pH Units	-	5.9	6.0	6.2	5.0
pH _{fox}	pH Units	-	5.7	5.8	6.1	4.9
Reaction Rate (pH _{fox})	No unit	-	1	1	1	1
pH Difference	pH Units	-10	0.2	0.2	0.1	0.1



ANALYTICAL REPORT

CE164237 R0

Parameter	Units	LOR	Sample Number Sample Matrix Sample Name	CE164237.017 Soil HDD-BH011 2.7	CE164237.018 Soil HDD-BH011 4.00-4.45	CE164237.019 Soil HDD-BH013 4.00-4.45	CE164237.020 Soil HDD-BH014 4.00
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	-	5.1	6.4	6.3
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Conductivity (1:2) in soil Method: AN106 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	-	13	27	12
Resistivity (1:2)*	ohm cm	-	-	76000	37000	81000
Resistivity (1:2)*	ohm m	1	-	760	370	810

Chloride (water extractable) Method: AN274 Tested: 30/1/2023

Chloride (water extractable 1:2)	mg/kg	5	-	<5	<5	<5
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 30/1/2023

Sulfur, S	mg/kg	1	-	<1	<1	<1
Sulfur as Sulfate, SO ₄	mg/kg	3	-	<3	<3	<3

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pH _f	pH Units	-	5.1	-	-	-
pH _{fox}	pH Units	-	5.1	-	-	-
Reaction Rate (pH _{fox})	No unit	-	2	-	-	-
pH Difference	pH Units	-10	0.0	-	-	-



ANALYTICAL REPORT

CE164237 R0

Sample Number	CE164237.021	CE164237.022	CE164237.023	CE164237.024
Sample Matrix	Soil	Soil	Soil	Soil
Sample Name	HDD-BH015 5.50	HDD-BH016 5.30	UCN-AH009 0.25	UCN-AH009 0.50

Parameter	Units	LOR
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	5.0	4.6	-	-
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Conductivity (1:2) in soil Method: AN106 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	15	25	-	-
Resistivity (1:2)*	ohm cm	-	68000	40000	-	-
Resistivity (1:2)*	ohm m	1	680	400	-	-

Chloride (water extractable) Method: AN274 Tested: 27/1/2023

Chloride (water extractable 1:2)	mg/kg	5	<5	9	-	-
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 27/1/2023

Sulfur, S	mg/kg	1	2	1	-	-
Sulfur as Sulfate, SO4	mg/kg	3	6	4	-	-

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pHf	pH Units	-	-	-	4.9	5.3
pHfox	pH Units	-	-	-	4.8	5.1
Reaction Rate (pHfox)	No unit	-	-	-	2	2
pH Difference	pH Units	-10	-	-	0.1	0.2



ANALYTICAL REPORT

CE164237 R0

Sample Number	CE164237.025	CE164237.026	CE164237.027	CE164237.028
Sample Matrix	Soil	Soil	Soil	Soil
Sample Name	UCN-AH009 0.75	UCN-AH009 1.10	UCN-AH025 0.25	UCN-AH025 0.50

Parameter	Units	LOR
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	-	5.5	-	-
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Conductivity (1:2) in soil Method: AN106 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	-	13	-	-
Resistivity (1:2)*	ohm cm	-	-	76000	-	-
Resistivity (1:2)*	ohm m	1	-	760	-	-

Chloride (water extractable) Method: AN274 Tested: 30/1/2023

Chloride (water extractable 1:2)	mg/kg	5	-	<5	-	-
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 30/1/2023

Sulfur, S	mg/kg	1	-	<1	-	-
Sulfur as Sulfate, SO ₄	mg/kg	3	-	<3	-	-

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pH _f	pH Units	-	5.2	5.4	5.9	6.2
pH _{fox}	pH Units	-	5.1	5.2	5.7	6.2
Reaction Rate (pH _{fox})	No unit	-	2	2	3	2
pH Difference	pH Units	-10	0.1	0.2	0.2	0.0



ANALYTICAL REPORT

CE164237 R0

Sample Number	CE164237.029	CE164237.030	CE164237.031	CE164237.032
Sample Matrix	Soil	Soil	Soil	Soil
Sample Name	UCN-AH025 0.75	UCN-AH025 0.9	UCN-AH033 0.5	UCN-AH033 0.9

Parameter	Units	LOR
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	-	5.7	-	5.3
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Conductivity (1:2) in soil Method: AN106 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	-	15	-	9
Resistivity (1:2)*	ohm cm	-	-	69000	-	120000
Resistivity (1:2)*	ohm m	1	-	690	-	1200

Chloride (water extractable) Method: AN274 Tested: 30/1/2023

Chloride (water extractable 1:2)	mg/kg	5	-	<5	-	<5
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 30/1/2023

Sulfur, S	mg/kg	1	-	2	-	<1
Sulfur as Sulfate, SO4	mg/kg	3	-	7	-	<3

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pHf	pH Units	-	5.7	5.7	5.7	5.4
pHfox	pH Units	-	5.5	5.6	5.6	5.2
Reaction Rate (pHfox)	No unit	-	2	2	2	1
pH Difference	pH Units	-10	0.2	0.1	0.1	0.2



ANALYTICAL REPORT

CE164237 R0

Parameter	Units	LOR	Sample Number Sample Matrix Sample Name	CE164237.033 Soil UCN-AH024 0.25	CE164237.034 Soil UCN-AH024 0.50	CE164237.035 Soil UCN-AH024 0.75	CE164237.036 Soil UCN-AH024 0.90
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	-	-	-	-
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Conductivity (1:2) in soil Method: AN106 Tested: 27/1/2023

Conductivity (1:2) @25 C	µS/cm	1	-	-	-	-
Resistivity (1:2)*	ohm cm	-	-	-	-	-
Resistivity (1:2)*	ohm m	1	-	-	-	-

Chloride (water extractable) Method: AN274 Tested: 30/1/2023

Chloride (water extractable 1:2)	mg/kg	5	-	-	-	-
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Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: AN002/AN320 Tested: 30/1/2023

Sulfur, S	mg/kg	1	-	-	-	-
Sulfur as Sulfate, SO4	mg/kg	3	-	-	-	-

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pHf	pH Units	-	5.0	5.1	5.3	5.1
pHfox	pH Units	-	5.0	5.0	5.2	5.1
Reaction Rate (pHfox)	No unit	-	2	2	2	2
pH Difference	pH Units	-10	0.0	0.1	0.1	0.0



ANALYTICAL REPORT

CE164237 R0

Sample Number CE164237.037
Sample Matrix Soil
Sample Name UCN-AH635 0.75

Parameter	Units	LDR
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pH in soil (1:2) Method: AN101 Tested: 27/1/2023

pH (1:2)	pH Units	-	-
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Conductivity (1:2) in soil Method: AN906 Tested: 27/1/2023

Conductivity (1:2) @25 C	$\mu\text{S/cm}$	1	-
Resistivity (1:2)	ohm cm	-	-
Resistivity (1:2)	ohm.m	1	-

Chloride (water extractable) Method: AN274 Tested: 30/1/2023

Chloride (water extractable 1:2)	mg/kg	5	-
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Water Soluble Metals in Soil by ICPOE3 From 1:2 extract Method: AN002/AH820 Tested: 30/1/2023

Sulfur, S	mg/kg	1	-
Sulfur as Sulfate, SO ₄	mg/kg	3	-

Field pH for Acid Sulphate Soil Method: AN104 Tested: 25/1/2023

pH	pH Units	-	5.1
pH _{so}	pH Units	-	5.0
Reaction Rate (pH _{so})	No unit	-	1
pH Difference	pH Units	+10	0.1

MS blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: the absolute difference of the two results divided by the average of the two results as a percentage. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

Chloride (water extractable) Method: ME-(AU)-ENV/AN274

Parameter	QC Reference	Units	LOR	MS	DUP-MSDP	LCS %Recovery
Chloride (water extractable 1:2)	LS111623	mg/kg	5	<5	0%	98%

Water Soluble Metals in Soil by ICPOES From 1:2 extract Method: ME-(AU)-ENV/AN002/AN320

Parameter	QC Reference	Units	LOR	MS	LCS %Recovery
Sulfur, S	LS111625	mg/kg	1	<1	104%
Sulfur as Sulfate, SO4	LS111625	mg/kg	3	<3	104%

METHOD

METHODOLOGY SUMMARY

AN002/AN320	Soil sample is extracted in deionised water (1:2 or 1:5) and metals analysed by ICP OES, method AN320/AN321, with results reported on the dried sample basis.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:2 and the pH determined and reported on the extract after 1 hour extraction (pH 1:2) or after 1 hour extraction and overnight aging (pH (1:2) aged). Reference APHA 4500-H+.
AN104	pHF is determined on an extract of approximately 2g of as received sample in approximately 10 mL of deionised water with pH determined after standing 30 minutes.
AN104	pHFox is determined on an extract of approximately 2g of as received sample with a few mLs of 30% hydrogen peroxide (adjusted to pH 4.5 to 5.5) with the extract reaction being rated from slight to extreme, with pH determined after reaction is complete and extract has cooled. Referenced to AGS Laboratory Methods Guidelines, method 23AF-Bf, 2004. <ul style="list-style-type: none"> 0 No Reaction 1 Slight Reaction 2 Moderate Reaction 3 Strong/High Reaction 4 Extreme/Vigorous Reaction (gas evolution and heat generation)
AN106	Conductivity : Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as $\mu\text{mhos/cm}$ or $\mu\text{S/cm}$ @ 25°C. For soils, an extract of as received sample with water is made at a ratio of 1:2 and the EC determined and reported on the extract basis after the 1 hour extraction (EC(1:2)) or after the 1 hour extraction and overnight aging (EC(1:2) aged). Reference APHA 2510 B.
AN106	Resistivity of the extract is reported on the extract basis and is the reciprocal of conductivity. Salinity and TDS can be calculated from the extract conductivity and is reported back to the soil basis.
AN274	Chloride by DA following 1:5 or 1:2 DI water extraction: Chloride reacts with mercuric thiocyanate forming a mercuric chloride complex. In the presence of ferric iron, highly coloured ferric thiocyanate is formed which is proportional to the chloride concentration. Results reported on dry sample basis. Reference APHA 4500Cl-

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
***	Indicates that both * and ** apply.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- 1 Bq is equivalent to 27 pCi
- 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: www.sgs.com/en-en/environment-health-and-safety.

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CLIENT DETAILS

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Project: **P5136008 Daintree Renewable Microgrid**
 Order Number: **(Not specified)**
 Samples: **37**

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Samples Received: **Tue 24/1/2023**
 Report Due: **Fri 3/2/2023**
 SGS Reference: **CE164237**

SUBMISSION DETAILS

This is to confirm that 37 samples were received on Tuesday 24/1/2023. Results are expected to be ready by COB Friday 3/2/2023. Please quote SGS reference CE164237 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix:	37 Soil	Type of documentation received	COC
Date documentation received	24/1/2023	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	Ambient
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	1

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

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CLIENT DETAILS

Client WSP AUSTRALIA PTY LIMITED

Project P0135008 Daintree Renewable Microgrid

SUMMARY OF ANALYSIS

No.	Sample ID	Chloride (water extractable)	Conductivity (1:2) in soil	Field pH for Acid Sulphate Soil	pH in soil (1:2)	Water Soluble Metals in Soil by ICPOES From 1:2
001	CGF-BH001 6-6.45	1	3	-	1	2
002	CGF-BH007 0.5-0.95	1	3	-	1	2
003	CGF-BH008 4.5-4.95	1	3	-	1	2
004	CGF-BH009 1.5-1.95	1	3	-	1	2
005	HDD-BH003 2.1	-	-	4	-	-
006	HDD-BH003 2.35	-	-	4	-	-
007	HDD-BH003 3.3	-	-	4	-	-
008	HDD-BH003 4.3	1	3	4	1	2
009	HDD-BH004 5.5-5.95	1	3	-	1	2
010	HDD-BH005 1.00	-	-	4	-	-
011	HDD-BH005 1.25	-	-	4	-	-
012	HDD-BH005 2.25	-	-	4	-	-
013	HDD-BH005 3.25	-	-	4	-	-
014	HDD-BH006 2.70	-	-	4	-	-
015	HDD-BH006 4.25	1	3	4	1	2
016	HDD-BH011 1.2	-	-	4	-	-
017	HDD-BH011 2.7	-	-	4	-	-
018	HDD-BH011 4.00-4.45	1	3	-	1	2
019	HDD-BH013 4.00-4.45	1	3	-	1	2
020	HDD-BH014 4.00	1	3	-	1	2
021	HDD-BH015 5.50	1	3	-	1	2
022	HDD-BH016 5.30	1	3	-	1	2
023	UCN-AH009 0.25	-	-	4	-	-
024	UCN-AH009 0.50	-	-	4	-	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.

The numbers shown in the table indicate the number of results requested in each package.

Please indicate as soon as possible should your request differ from these details.

Testing as per this table shall commence immediately unless the client intervenes with a correction.

CLIENT DETAILS

Client: WSP AUSTRALIA PTY LIMITED

Project: P3135008 Daintree Renewable Microgrid

SUMMARY OF ANALYSIS

No.	Sample ID	Chloride (water extractable)	Conductivity (1:2) in soil	Field pH for Acid Sulphate Soil	pH in soil (1:2)	Water Soluble Metals in Soil by ICPOES From 1:2
025	UCN-AH009 0.75	-	-	4	-	-
026	UCN-AH009 1.10	1	3	4	1	2
027	UCN-AH025 0.25	-	-	4	-	-
028	UCN-AH025 0.50	-	-	4	-	-
029	UCN-AH025 0.75	-	-	4	-	-
030	UCN-AH025 0.9	1	3	4	1	2
031	UCN-AH033 0.5	-	-	4	-	-
032	UCN-AH033 0.9	1	3	4	1	2
033	UCN-AH024 0.25	-	-	4	-	-
034	UCN-AH024 0.50	-	-	4	-	-
035	UCN-AH024 0.75	-	-	4	-	-
036	UCN-AH024 0.90	-	-	4	-	-
037	UCN-AH030 0.75	-	-	4	-	-

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.

The numbers shown in the table indicate the number of results requested in each package.

Please indicate as soon as possible should your request differ from these details.

Testing as per this table shall commence immediately unless the client intervenes with a correction.

Appendix I – Visual Amenity Assessment



Volt Advisory

Development Application
Supporting Information

Visual Amenity Assessment

March 2023



environmentPACIFIC

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1. Introduction

1.1 Supporting Information Report

This report provides supporting information for the Daintree Microgrid (DMG) project with respect to supporting a Development Application to the Douglas Shire Council.

This visual amenity assessment is for the construction and operation of a hybrid solar/hydrogen power generation plant to be located in Cow Bay on Lot 5 BK157130, and the associated cable distribution network within the road reserves between (and including) Cow Bay to Cape Tribulation.

1.2 Aspect

Visual amenity is an important aspect of the Daintree experience, whether for residents and local community, or visitors to the region. A number of components of the Daintree Microgrid Project have the potential to impact on visual amenity. These are broadly divided into two categories;

- Far-field viewshed visual impacts
- Near-field viewshed visual impacts

Far-field viewshed visual impacts are those that are experienced at distance from project elements. In this project instance, this considers:

- The solar farm and array to be visible from key World Heritage Area vantage points, or from other landscape scale viewsheds in the area.
- Glint and glare from the solar farm arrays potentially visible from vantage points.

Near-field viewshed visual impacts are those that are sustained in proximity to project elements. For this project, near-field visual impact elements include:

- Construction aspects – machinery traffic, open trenching and HDD operations.
- Operational aspects – solar farm arrays and supporting infrastructure, transformers and network kiosks along the cable distribution network.

Both a far-field and near-field assessment of the visual amenity of the Daintree Microgrid Project has been undertaken. The salient elements relevant to project management are set out below:

2. Methodology

2.1 Far-field viewsheds

In order to assess far-field viewsheds all likely visible vantage points of the solar farm were identified within a 5km radius of the site. Primarily this involved an initial GIS comparison of local contour profiles (ridges and slopes), to identify likely line-of-sight between a vantage point and the solar farm. This was followed up by physical visits to these locations, nearly all of which are elevated.

Other key considerations included the potential for the solar farm to be viewed from any National Park/Wet Tropics World Heritage Area, and any other public view point.

Key areas where visits were undertaken to determine viewsheds included:

- Walu Wugirriga Lookout (Alexandra Range)
- White Beech Road
- Red Gum Road

- Mahogany Road
- Buchanan Creek Road
- Cape Tribulation Road (Alexandra Range northern section).

2.2 Near field viewshed

Near field aspects will be encountered during construction of the cable distribution network and solar farm and of the solar farm and transformers and kiosks operationally.

During construction the key aspects will be the movement of machinery, cable works associated with trenching and HDD operations, and general visual amenity related to construction works such as waste.

Operationally, ancillary works in the road reserve include 27 transformers in kiosk style containers (approximately 2m x 1.5 x 1.5m), and junction boxes (typical Ergon housing, being approximately 50cm x 50cm x 70cm). The cables will be invisible underground when completed.

Operationally, the solar farm itself will not be visible from residences on the eastern side of Silkwood Road owing to the retained vegetation on these properties, however it *will* be visible to traffic accessing these properties on Silkwood Road. This near-field viewshed, in the absence of any mitigation measures, will reduce the Daintree experience for visitors to commercial premises (B & B accommodation) at the southern end of Silkwood Road.

Visits were undertaken to the approximate proposed locations of the transformers, Silkwood Road, and Buchanan Creek Road. No part of the solar farm is visible from residential locations owing to screening vegetation and no further viewshed analysis from private residences was undertaken.

3. Assessment

3.1 Far Field Viewshed

3.1.1 Viewpoints from Wet Tropics World Heritage Area:

The solar farm is invisible from any vantage point except the immediate vicinity on Silkwood Road. It will not be visible from the nearest section of the WTWHA and the Daintree National Park. At its closest point the Cape Tribulation Road through the Daintree National park is greater than 1km from the solar farm, and completely obscured by forest (see Plate 1 and Plate 2). The Walu Wugirriga lookout at the top of the range faces south-east over the Daintree River. The northern viewshed from the lookout is obscured by mature rainforest with no physical view possible north. Subsequently potential glint and glare from the mirrored solar panels will not be discernible from any vantage point within the WTWHA. The solar farm may be observed from the WTWHA should anyone from the public climb the Telecom Tower at the Alexandra Range lookout, but this is deemed to be an extremely unlikely event (tower is security fenced and access is locked).

3.1.2 Viewpoints from residential and business areas

With respect to residential locations within a 5km proximity, the highest residential areas are located at the top of White Beech and Red Gum Road (Cow Bay) approximately 2.8km from the solar farm, and Mahogany Road (Diwan) approximately 5km from the solar farm.

The topography of the area effectively shields all viewsheds of the solar farm from every elevated vantage point in Cow Bay and Diwan. The solar array (maximum of 2.6m height), and single storey containerised supporting infrastructure will not be visible from any of these locations and subsequently there will not be any properties subject to glint and glare from the solar arrays.

Plate 1 Walu Wugirriga Lookout viewshed



Only viewshed from Alexandra Range lookout is to the south, over the Daintree River. There is no viewshed to the north towards the DMG solar farm

Plate 2 Viewshed northern side of Alexandra Range



Viewshed from the Cape Tribulation Road within the Daintree NP WTWHA on the Alexandra Range, looking north, with solar farm site on right hand side.

Plate 3 Viewshed northern side of Alexandra Range

Aerial view of solar farm site (yellow dashes) looking southwards towards WTWHA on Alexandra Range



Figure 1 Overview. WTWHA boundary in yellow

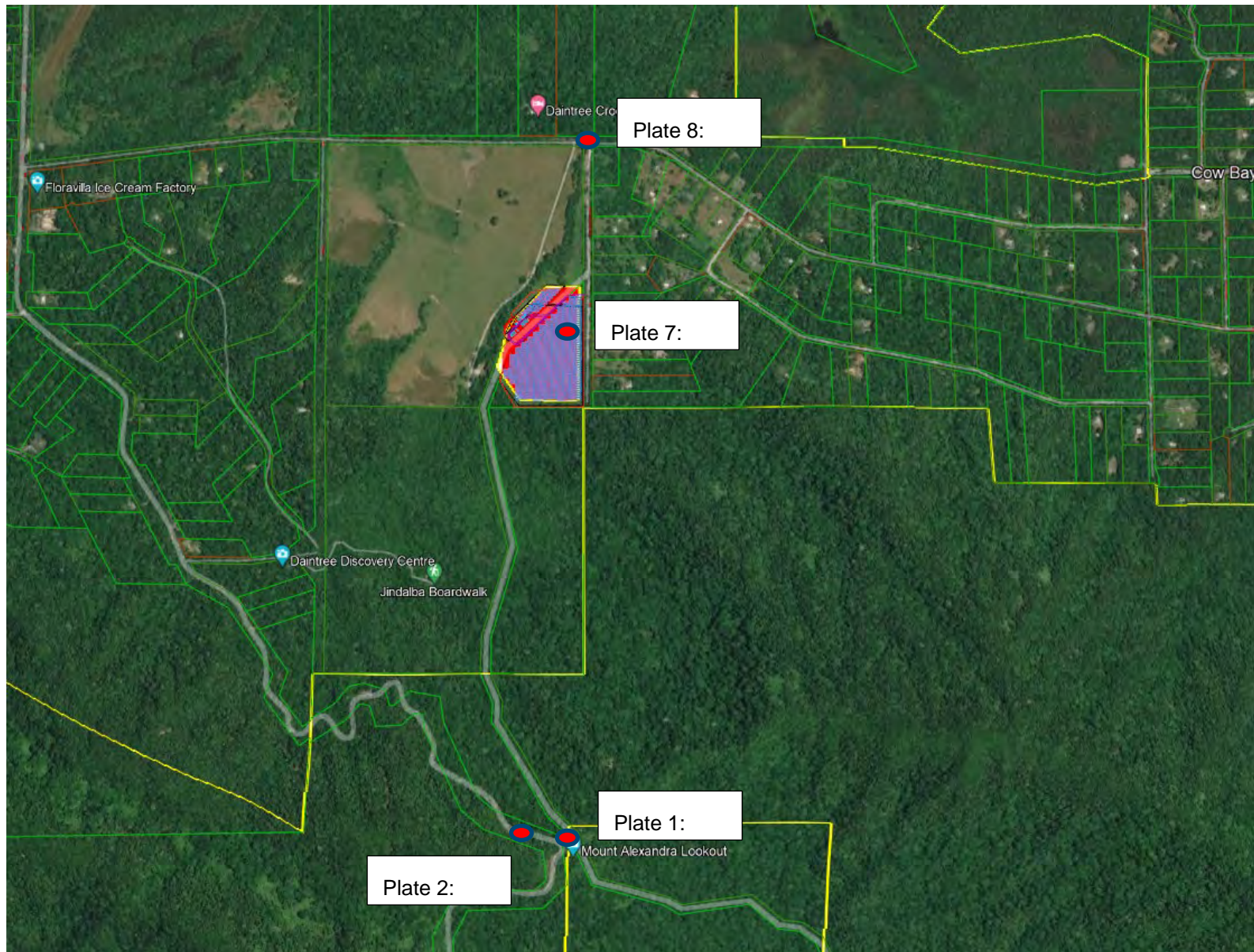
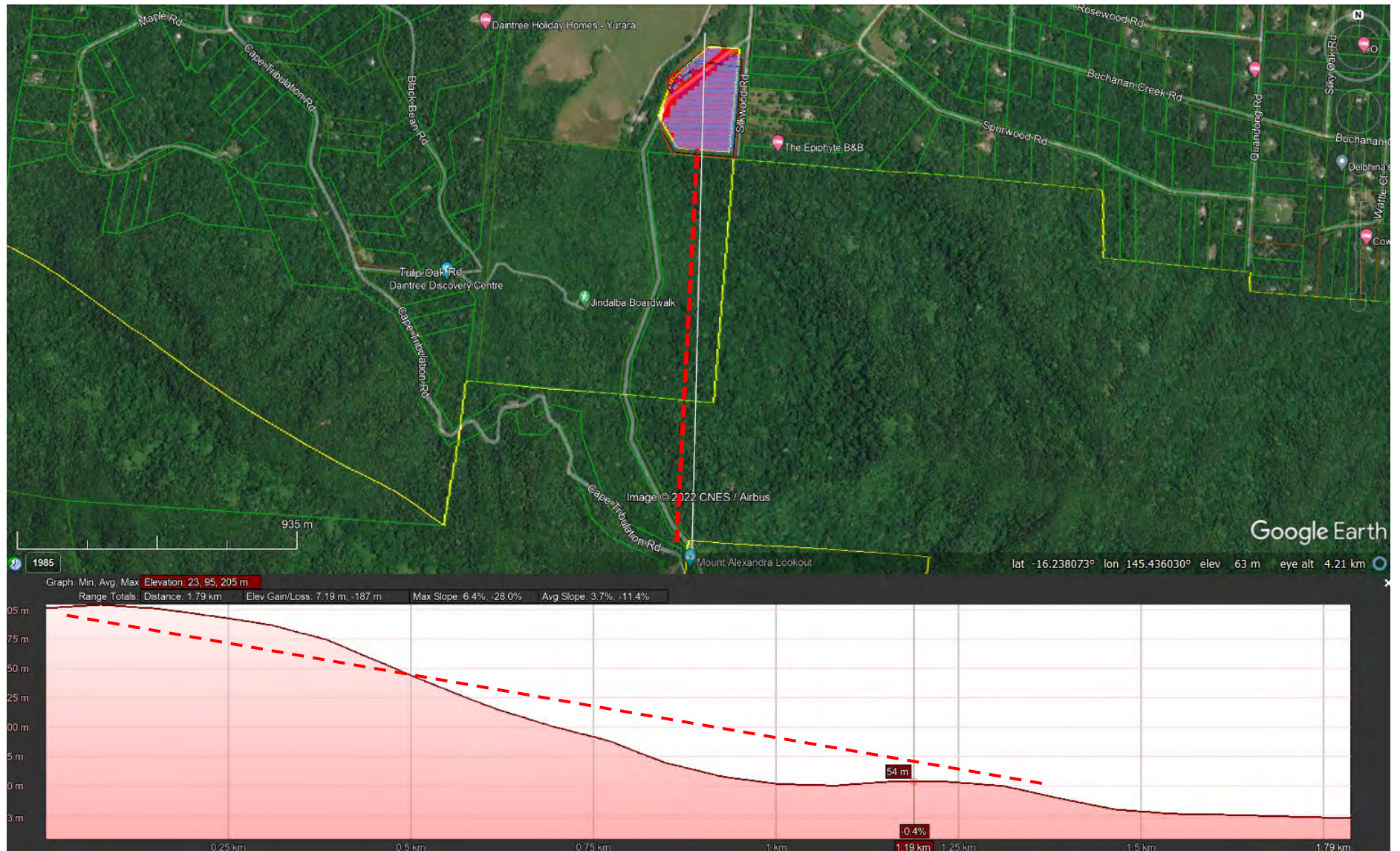


Figure 2 Elevation visibility profile (lookout to solar farm)



3.2 Nearfield Viewsheds

3.2.1 Residential and Business Impacts

Operationally, the solar farm itself will not be visible from residences on the eastern side of Silkwood Road owing to the retained vegetation on these properties, however it will be visible to traffic accessing these properties on Silkwood Road. This near-field viewshed, in the absence of any mitigation measures, may reduce the Daintree experience for visitors to commercial premises (B & B accommodation) at the southern end of Silkwood Road. The DMG project has engaged a commercial revegetation/rehabilitation company who will substantially 'thicken' the vegetation along the Silkwood Road reserve to further mitigate the potential for near-field viewshed impacts. The approach has been discussed and agreed upon with the owner of the affected air B n B on Silkwood Road.

The kiosks and transformers along the distribution network are limited in number, do not require extensive earthworks, and are designed to be visually non-intrusive. This includes the use of suitable colouration, form and size, and strategic location.

Plate 4: Intersection of Silkwood Road and Buchanan Creek Road



Intersection of Silkwood Road and Buchanan Creek Road, looking south towards entrance to solar farm site approximately 600m down Silkwood Road from the intersection. Vegetation planted on right of photo by DSC. This extent of revegetation will be extended along Silkwood Road on the side bordering the solar farm to further shield the PV arrays from view along the road.

3.2.2 Glint and Glare Effects

Glint and glare from the solar array will not be experienced along Silkwood Road (or in any other nearby vicinity, e.g. Buchanan Creek Road.). This is due to low height of the solar panels (highest being 2.6m), orientation to the north (landholders are all east of Silkwood Road), and panels individually set according to the topography of the site, i.e., no large grouping of panels at any one height.

Additionally, all residences and businesses along Silkwood Road are shielded from direct view of the solar arrays by existing vegetation on the western side of their properties. The only viewshed of the solar arrays will be via local traffic travelling along Silkwood Road. There is an existing roadside verge of vegetation on Silkwood Road, and following discussions with some residents on Silkwood Road, and the DMG project has committed to further increasing the shielding effect of the existing vegetation barrier on Silkwood through additional planting to 'thicken' the existing vegetation.

Discussions have been undertaken with some residents adjacent the solar farm, and the DMG project has committed to further increasing the shielding effect of the existing vegetation barrier on Silkwood through further planting.

Plate 5: Looking north down Silkwood Road



Top of Silkwood Road, looking north towards Buchanan Creek Road (820m away). Solar farm generation site is on left of photo. Further revegetation of the vegetation on the western side of Silkwood Road will be undertaken along the solar farm lease boundary.

Plate 6: Looking south down Silkwood Road



Approximate midpoint of Silkwood Road, looking south, at northern extent of solar farm lease boundary. Vegetation to be further thickened (right of photo).

3.2.3 Road reserve ancillary infrastructure

The transformers kiosks along the distribution network do not require extensive earthworks, and are designed to be visually non-intrusive. This includes the use of suitable colouration, form and size, and strategic location. Up to 27 transformers may be installed over the 56 km of road reserve network, and are approximately 2m x 1/5 x 1.5m in dimensions. They will be set back from the road verge, and will not require any vegetation removal for their construction and installation. The junction boxes are green, small (approximately 50cm x 50cm x 70cm), housing connections between residences (or groups of residences in a common area), and are typically those used by Ergon Energy for their underground services. The total number will depend on customer connection localities.

Jabalbina Aboriginal Corporation has been engaged to provide artwork for the transformer kiosks, appropriate and complimentary to the Daintree environment and Eastern Kuku Yalanji traditions. An example of a painted transformer (Brisbane urban environment) is shown below. The actual transformer will be more streamlined than this and feature Eastern Kuku Yalanji art. Traditional owner representatives will also be engaged for all aspects of the construction phase as cultural heritage monitors, and an ecologist will also be engaged to ensure all works are compliant with the Environmental Management Plan for the project (Appendix G attached to the Planning Report).

Plate 7 Kiosk and junction boxes (examples)



3.3 Fauna and Habitat Impacts

Shading of the solar farm on adjacent habitats will not occur: the tallest panel is 2.6m and all infrastructure is set back a minimum 20m from the edge of the vegetation. Surveys of the vegetation about the boundaries of the PV arrays has determined that the average height of the primarily successional species is approximately 8 to 12m.

Glint and glare from the solar panels is deemed not to impose any impacts on local environmental values as:

- The panels are individually set according to the topography of the site. The site has a rolling topography, so the angle of each panel will be slightly different to that of its neighbour. Sunlight will therefore only glint from individual panels at a time, or a few together at best (provided on the same slope and orientation). Unlike panels on flat topography there will be no situation where large quantities of panels in the one location (e.g. 10s or 100s) will provide a single, large scale glare phenomenon.
- The lowset nature of the panel (highest being 2.6m above the ground), renders any throwback glint/glare to a very restricted arc of viewing, which basically would be restricted to someone walking down that line of the panels.

- Birds flying overhead (or tourist overflights) would be subject to glint and glare from isolated individual panels or small groups at worst, in a manner not dissimilar to existing galvanised tin roofing, or household roof mounted solar panels. There are no large-scale daylight migratory bird overflights in the Daintree that could be affected by this phenomena, and low flying aircraft over the WTWHA are permitted only as a regulated activity under the WT Plan and regulations.

4. Conclusions

The DMG project will have its greatest visual amenity impact during the construction phase owing to general construction associated with cable laying works within a highly public area, i.e, the road reserve network. Construction works at the solar farm site will largely be invisible to the public, owing to distance from heavily trafficked roads, e.g. Cape Tribulation Road, but will be visible to local traffic along Silkwood Road. The solar farm work site will not be visible to residential/commercial premises along Silkwood Road owing to the shielding effect of rainforest on their own properties between infrastructure and the solar farm site.

Operationally, a revegetation program will be commissioned by the DMG project proponents to increase the density of road reserve vegetation along Silkwood Road to further improve the visual barrier between the road and the solar farm site.

The solar farm is not visible from any other location within the Cow Bay/Diwan area, and is not visible from any vantage point within the Daintree National Park / Wet Tropics World Heritage Area. Subsequently glint and glare aspects related to the reflectivity of the silicon glass PV solar arrays cannot be discerned from any viewpoint. This includes along Silkwood Road where the height of the PV arrays (2.6m) and their orientation (northwards) precludes any physical possibility of glint and glare to ground level in these locations.

Similarly, owing to the siting of the PV arrays along the natural contours of the solar farm generation site, there are no locations where the glint and glare will occur as a whole for the arrays. Individual panels or small groups of panels on a common alignment will produce glint and glare, but is not sufficient in itself to have any overflight impacts for birds or aircraft/helicopters. At most, the glint and glare will be commensurate with a new galvanised tin roof of a shed or building.

The transformer kiosks along the distribution network are limited in number, do not require extensive earthworks, and are designed to be visually non-intrusive. This includes the use of suitable colouration, form and size, and strategic location. Jabalbina Aboriginal Corporation has been engaged to contract local traditional artists representing country to decorate the kiosks

Elements in the DMG project EMP (refer Appendix G in the Planning Report) to manage near field visual impacts are included in multiple sections and include.:

- Visual amenity
- Traffic management
- Waste management

Overall, the potential visual intrusiveness of the DMG project, post construction, is expected to be minor, and of no detracting to the visual amenity of the Daintree experience. Silkwood Road will be the only viewpoint for the solar farm, and this will be largely ameliorated by existing road side vegetation (taller than the solar farm components), which will be further revegetated, substantially reducing further the visual impact.

Appendix J – Jabalbina Corporation letter of support

Jabalbina Yalanji Aboriginal Corporation RNTBC

ABN 79 611 886 178

ICN 7002

Jabalbina Yalanji Land Trust

ABN 54 650 095 845



Jabalbina

Daintree Renewable Microgrid Letter of Support

In 1988 Daintree National Park received World Heritage listing by UNESCO in recognition of its universal natural values and is now part of the Wet Tropics World Heritage Area (WTWHA). In September 2021 the Daintree National Park was officially handed back to the Eastern Kuku Yalanji Traditional Owners and today we are in a transitional phase with Queensland National Park Service supporting the Joint Management of the national park.

Historically Eastern Kuku Yalanji people have lived and used the entire landscape between Cow Bay and Cape Tribulation for at least 65,000 years. Many Eastern Yalanji Bama would like to come and live back in this region of their country however some of the necessities of life do not currently exist to support this ambition. Jabalbina the Registered Native Title Body has housing blocks zoned for residential purposes available for Traditional Owners seeking to live in the Cow Bay and Cape Tribulation community. Returning Bama (Aboriginals) to our Bubu (land) is an important aspiration for us and we believe there is no better stewards of the Daintree than the Traditional Owners themselves.

Without reliable power to feed housing, the opportunity to live in this isolated area becomes more challenging. The Daintree Renewable Microgrid will allow Traditional Owners who wish to return to their country greater opportunity and ease when doing so. We also foresee an increase in employment opportunities through new businesses such as eco-tourism, accommodation, restaurants, and retail. Some Traditional Owners will even realise opportunities to work on the maintenance and the ongoing delivery of the Daintree micro-grid power supply.

Traditional Owners Andrew Solomon, Clive Sykes, Chris Johnson, and Betty Olbar, have the Cultural Authority to speak for the Daintree Renewable Microgrid footprint and are unified in their wish to see the Daintree Micro Grid completed. All agree it is needed to protect their country from the current overuse of diesel fuel generators currently powering most homes and businesses between Cow Bay and Cape Tribulation, which is hurting their country.

Establishing the solar farm and making available grid power, will allow not only themselves but other Eastern Kuku Yalanji families to live on their country with the necessities available that most take for granted. Given Daintree's environmental and economic importance, clean and reliable grid power should have been a priority many years ago.

Jabalbina has a strong collaborative relationship with Volt Advisory Group and both parties agree on the need to put Traditional Owners' needs at the forefront of any project scope and decision making. A Cultural Heritage Assessment has been undertaken that involved an extensive Traditional Owner consultation, Jabalbina acknowledges the work Volt Advisory Groups has undertaken to ensure the scope of work for the Daintree Micro Grid is delivered in a way that does not impact upon the natural cultural integrity of the area.

Jabalbina is pleased to support the proposed design for the Daintree Renewable Microgrid.

Yours sincerely,

Joshua Paterson
General Manager

"Yalanjiwarra muruku junkurrjimaka bamangka bubuku"

Yalanji people stand strong together for our people and our land

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MOSSMAN, QLD 4873

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www.jabalbina.com.au

Appendix K – Tables of Code & Overlay Assessments

Appendix K – Tables of Code & Overlay Assessments

Part A: Tables of Assessment, MCU/RoL Lot 5 on BK157130

Part B: Tables of Assessment - Operational Works on Local Govt Roads (internal road, Solar Farm site)

PART A:

**Tables of Assessment, MCU, RoL,
Solar Farm Generation Site Lot 5 BK157130**

6.2 Zone codes

6.2.3 Conservation zone code

Table 6.2.3.3.a - Conservation zone – assessable development

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
PO1 The establishment of uses is consistent with the outcomes sought for the Conservation zone and protects the zone from the intrusion of inconsistent uses.	AO1 Uses identified in Table 6.2.3.3.b are not established in the Conservation zone.	Complies The construction and operation of the solar farm generation site is not listed under Table 6.2.3.3b as an inconsistent use.
PO2 The height of buildings is compatible with the character of the area and does not adversely affect the amenity of the area.	AO2 Buildings and structures are not more than 8.5 metres in height and two storeys. Note - Height is inclusive of roof height.	Complies: The tallest building is the containerised electrolyser unit, which is 4.61m tall. The telemetry/SCADA antennae mounted to the electrolyser unit is 7.5m tall. Refer drawing DRE-CIV-GAR-1012
PO3 Development is setback from site boundaries so they are screened from view from the boundaries of adjoining properties and adjoining roads to maintain the scenic values of the area.	AO3 Buildings and structures are setback not less than: (a) 40 metres from the frontage of a State controlled road, existing or proposed arterial road, existing or proposed sub-arterial road, as identified on the Transport network overlay maps contained in Schedule 2; (b) 25 metres from Cape Tribulation Road frontage; (c) 20 metres from any other road frontage (d) 10 metres from side and rear boundaries.	Complies (a) Complies. No part of the proposal is within 40m of a state controlled road or any other road identified in the Transport network overlay maps in Schedule 2 (b) Complies. No part of the solar farm generation site is within 25m of the Cape Tribulation Road (c) Complies. All buildings and structures are set back a minimum of 20m from Silkwood Road and Buchanan Creek Road. (d) Complies. All parts of the proposal are a minimum of 10m from the side and rear boundaries. . Refer drawings DRE-ELE-GAR-1001,
PO4 The site coverage of all buildings and structures does not have an adverse effect on the	AO4 Development is sited in an existing cleared area or an area approved for clearing, but which is not yet	Complies: The entirety of the solar farm generation facility is located within areas previously cleared and currently used for cattle grazing.

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
conservation or scenic amenity values of the site and surrounding area and buildings are subservient to the natural environment.	<p>cleared until a development permit to carry out Building Works is issued. Any clearing is limited to a maximum area of 700m² and is sited clear of the high bank of any watercourse.</p> <p>Note – The 700m² area of clearing does not include an access driveway.</p>	The bank of Buchanan Creek, the nearest watercourse, is outside of the lease area and is approximately 45m from the nearest solar farm structure, with a vegetation buffer of 20m to be maintained.
<p>PO5</p> <p>Development is consistent with the overall outcomes sought for the Conservation zone.</p>	<p>AO5</p> <p>No acceptable outcomes are prescribed.</p>	<p>Complies</p> <p>The operational works component (electricity utilities distribution) is consistent with the overall outcomes of the Conservation Zone in that:</p> <ul style="list-style-type: none"> a) The works in the road reserves is an essential component in delivering a sustainable, renewable power supply from the proposed Daintree Microgrid Project. – thereby reducing reliance on hydrocarbon fuels and reducing the carbon emission footprint from the Daintree region. b) No vegetation / habitats are required to be cleared/disturbed for works within the road reserve. All cable works will either be: <ul style="list-style-type: none"> a. Installed by cable trench within or adjacent the formed surface of the roads in areas that do not require vegetation clearances b. Installed by horizontal directional drilling (HDD) in areas such as beneath watercourses or where there are adjacent sensitive habitats (e.g. wetlands), where it is not possible to trench. c) The DMG solar farm generation site is essential in supporting Jabalbina in their Return to Country aspirations (supporting letter attached to DA).

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
P06 Development complements, and is subservient to the surrounding environment and is in keeping with the ecological, landscape and scenic values of the area.	AO6 The exterior finishes and colours of all development are non-reflective and consist of colours that blend easily with surrounding native vegetation and view-shed.	Alternative solution It is proposed that all containerised equipment used in generation, storage and other non-solar array infrastructure will be of a suitable colour to blend with the landscape. Eucalypt pale green is the nominated colour for external walls and roofing requirements. The solar panel arrays are reflective by necessary design requirements. A visual amenity assessment, including glint and glare aspects, has determined that there are no direct viewsheds of this aspect from any residential or commercial facility, however the solar arrays will be visible to traffic on Silkwood Road. The proponent will engage commercial contractors to thicken the existing vegetation along Silkwood Road as a further visual barrier.
P07 Development is screened from view from adjoining roads and properties with a dense screen of endemic/native landscape which: (a) is informal in character and complementary to the existing natural environment; (b) provides screening; (c) enhances the visual appearance of the development. Note – Planning scheme policy – Landscaping provides further guidance on meeting the performance outcome.	AO7.1 For any development, the balance area of the site not built upon, including all setback areas must be landscaped/revegetated with dense three tier, endemic planting which is maintained to ensure successful screening is achieved.	Alternative solution The solar farm generation site has very specific functional requirements related to the location and orientation of the solar arrays so as to avoid shading from trees along Silkwood Road and Buchanan Creek. As such, it is not possible to landscape/revegetate the balance of the site not built upon. The proponent will engage a commercial contractor to further revegetate and enhance the vegetation within the Silkwood Road reserve as an additional screening buffer. The solar farm generation equipment and solar arrays will not be visible from Buchanan Creek Road.
	AO7.2 Endemic palm species, where used, are planted as informal accent features and not as avenues and not in a regular pattern.	Not applicable No palm species are proposed to be planted.
P08 Development is complementary to the surrounding environment.	AO8.1 Development harmonises with the surrounding environment, for example, through suspended, light-weight construction on sloping sites, which	Complies The solar farm generation infrastructure is primarily on mild to flat slots and owing to the containerised nature of the infrastructure, does not need extensive earthworks as the

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
	requires minimal excavation or fill.	structures will generally be mounted on 900mm high steel pillars set into concrete foundations and requires no cut or fill bulk earthworks.
	AO8.2 A driveway or parking areas are constructed and maintained to: <ul style="list-style-type: none"> (a) minimise erosion, particularly in the wet season; (b) minimise cut and fill; (c) follow the natural contours of the site; (d) minimise vegetation clearing 	Not applicable No driveways or parking areas are proposed to be constructed. The access road from Silkwood Road is on very mildly sloping to flat land and requires minimal earthworks and no vegetation removal other than for the access from Silkwood Road. Refer drawings DRE-ELE-GAR-1001 and DRE-ELE-GAR-1003.
	AO8.3 Buildings and structures are erected on land not exceeding a maximum gradient of 1 in 6 (16.6%). or On land steeper than 1 in 6 (16.6%) gradient: <ul style="list-style-type: none"> (a) A split level building form is utilised; (b) A single plane concrete slab is not utilised; (c) Any voids between building and ground level, or between outdoor decks and ground level are screened from view using lattice/battens and/or landscaping. and <ul style="list-style-type: none"> (d) is accompanied by a Geotechnical Report prepared by a qualified engineer at development application stage which includes certification that the site can be stabilised followed by a certificate upon completion of works. 	Complies A geotechnical report has been prepared for the project and is appended to the Technical Information supporting report as Appendix H. None of the solar farm generation equipment is located on land exceeding a maximum gradient of 16.6%. Solar arrays in the extreme south-east corner of the site are on moderate slopes with an average gradient of <15%. Refer drawing DRE-ELE-GAR-1001.
	AO8.4 Buildings and structures are sited below any ridgelines and are sited to avoid protrusion above the surrounding tree-level canopy.	Complies None of the buildings and structures will protrude above the tree line. The tallest building is the containerised electrolyser unit, which is 4.61m tall. The telemetry/SCADA antennae mounted to

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
		<p>the electrolyser unit is 7.5m tall. Average tree height in the surrounding areas is 8 to 10m with occasional emergents to 12 to 15m.</p> <p>Refer drawing DRE-CIV-GAR-1012.</p>
<p>PO9 Development is located to:</p> <ul style="list-style-type: none"> (a) protect the ecological values of the site and surrounding land; (b) maintain the scenic values of the area; (c) maintain appropriate setbacks to waterways, watercourses, wetlands, tidal areas and overland flow paths; (d) avoid areas that are vulnerable to natural hazards; (e) minimise to the greatest extent possible on site excavation and filling; (f) provide buffers to cultural, historical or ecological features; (g) minimise visibility from external sites or public viewing points; (h) minimises to the greatest extent possible the loss of native vegetation and fauna habitat. 	<p>AO9 No acceptable outcomes are prescribed.</p>	<p>Complies</p> <ul style="list-style-type: none"> (a) The entirety of the development footprint is within cleared land, now under improved pasture for grazing. (b) The solar farm has been located such that it is not visible from any residence. It is only visible to pedestrians/traffic on the mid to upper sections of Silkwood road, but is not visible to residents from their premises. Road reserve vegetation will be thickened with additional planting to provide further screening. (c) Buchanan Creek, the nearest waterway, is 45m from the closest maintain appropriate setbacks to waterways, watercourses, wetlands, tidal areas and overland flow paths; (d) avoid areas that are vulnerable to natural hazards; (e) minimise to the greatest extent possible on site excavation and filling; (f) provide buffers to cultural, historical or ecological features; (g) minimise visibility from external sites or public viewing points; (h) minimises to the greatest extent possible the loss of native vegetation and fauna habitat.
<p>PO10 Development does not result in adverse impacts on:</p> <ul style="list-style-type: none"> (a) ecological function or features; (b) on-site or surrounding waterways and wetlands. 	<p>AO10 No acceptable outcomes are prescribed.</p>	<p>Complies</p> <p>Water generated from site operations will primarily be rainwater from runoff of the solar panels, and rejected water from the electrolysis process, i.e. rainwater contaminated with excess ions / organics that may pass through the water filtration system of the electrolysis unit. Rejected water quality is effectively commensurate with natural rain water and poses no environmental threat.</p>

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
PO11 Rehabilitation of natural processes on disturbed sites is undertaken to improve the environmental integrity of the area.	AO11 No acceptable outcomes are prescribed.	Complies
PO12 Fencing is designed to not impede the free movement of native fauna through the site.	AO12 No acceptable outcomes are prescribed.	Alternative solution Security fencing and lighting is a statutory requirement for generation sites under the provisions of the <i>Electrical Safety Act 2002</i> and associated regulations. As the solar farm will be a registered generation station under the <i>Electricity Act 1994</i> , there are compulsory requirements related to site security and safety. The security fence will be designed in accordance with the requirements of ENA Doc-015 National Guideline for Prevention of Unauthorised Access to Electricity Infrastructure. This guideline is not exclusive, with the security fencing between 1.8 and 2.0m high, and will not incorporate barbed wire, razor wire, knot wire meshes, or similar that may entrap bats, birds, reptiles or any other vulnerable fauna. The security fence will also protect large mobile fauna, e.g., cassowaries and wallabies, from potential hazard interaction with high-voltage electricity generation components.
PO13 New lots contain a minimum lot size of 200 hectares, unless: (a) the lot reconfiguration results in no additional lots (e.g. amalgamation, boundary realignments); (b) the reconfiguration is limited to one additional lot to accommodate an existing or approved: (i) Telecommunications facility; (ii) Utility installation; (c) the lot reconfiguration facilitates and	AO13 No acceptable outcomes are prescribed.	Complies The solar farm generation site lease lot reconfiguration is less than 200ha, however results in no additional lots, e.g., through amalgamation or boundary realignments.

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
<p>outcome consistent with the Return to Country local plan.</p> <p>Note – Boundary realignments must result in an improved environmental outcome or resolve encroachments.</p>		

7.2 Local plan codes

7.2.1 Cape Tribulation and Daintree Coast code

Table 7.2.1.10.a – Cape Tribulation and Daintree Coast local plan – all assessable development

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
PO1 Development does not result in a demand which exceeds the capacity of: <ul style="list-style-type: none"> (a) the Daintree River ferry crossing; (b) Alexandra Range Road; (c) the local road network. 	AO1 No acceptable outcomes are prescribed.	Complies The solar farm will have no quantifiable impact on facilitative development in the overall project area and will not result in traffic demand that exceeds the capacity of the transport networks identified in PO1. Traffic demand on the road and ferry network will be highest only for the construction phase of the project, and operationally traffic will be entirely restricted to normal maintenance and monitoring of electrical infrastructure. Refer to traffic management section in supporting technical documentation to this DA. A traffic management plan for construction will be developed by the contractor in association with DSC.
PO2 Development provides a suitable standard of self-sufficient service for: <ul style="list-style-type: none"> (a) potable water; (b) water for fire fighting purposes; (c) electricity supply. 	AO2.1 Water storage is provided in tank/s with a minimum capacity to service the proposed use, including fire fighting capacity, and access to the tank/s for fire trucks. Tank/s are to be: <ul style="list-style-type: none"> (a) fitted with a 50mm ball valve and camlock fitting; (b) installed and connected prior to occupation; (c) sited so as to be visually unobtrusive. 	Complies Proposed water tank on site will hold 110 kilo litres and will have required fittings to manufacturers specification. The tank will be 2.3m high and is set back from any public viewpoint, being > 130m from Silkwood Road and shielded by vegetation along the road reserve. Tank will also be of a colour compatible with the surrounding landscape, and will not be of bare steel. Ref drawing: DRE-CIV-GAR-1002.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	AO2.2 Water storage tanks are to be fitted with screening at their inlets to prevent the intrusion of leaves and insects.	Complies Proposed water tank will be fitted with all screening to prevent ingress of foreign material.
	AO2.3 An environmentally acceptable and energy efficient power supply is constructed, installed and connected prior to occupation and sited so as to be screened from the road.	Complies Project is a renewable solar/hydrogen hybrid community generation electricity supply. The solar farm is sited off the southern end of Silkwood Road, and is not visible from Buchanan Creek Road, nor from any viewshed in the area apart from traffic on Silkwood Road immediately adjacent the solar farm. Screening vegetation along Silkwood Road already partially obscures the viewshed from traffic on this road, and will be thickened with further revegetation.
PO3 On-site waste water does not adversely impact on the environmental quality of the water and soil resources or amenity of residents, through the implementation of best environmental practice.	AO3 No acceptable outcomes are prescribed.	Complies Water generated from site operations will primarily be rainwater from runoff of the solar panels, and rejected water from the electrolysis process, i.e, rainwater contaminated with excess ions / organics that may pass through the water filtration system of the electrolysis unit. Rejected water quality is effectively commensurate with natural rain water and poses no environmental threat.
PO4 The sustainability of the natural water resources of the area is protected for ecological and domestic consumption purposes.	AO4.1 If groundwater is to be used, development is limited to one bore per site and the bore is: not located within 100 metres of a septic disposal trench (on the site or adjoining sites); not located within 100 metres of another bore.	Complies No groundwater abstraction is required or proposed for this project.
	AO4.2 Surface water is to be used for domestic	Complies

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	purposes only.	No surface water abstraction is required or proposed for this project.
PO5 Development does not adversely impact on areas of sensitive natural vegetation, foreshore areas, watercourses and/or areas of tidal inundation.	AO5 No acceptable outcomes are prescribed.	Complies The development site is located entirely within cleared areas that are maintained as pasture. The site does not include any watercourses, with adjacent Buchanan Creek outside of the development area. Natural riparian vegetation on the western boundary of the site and along Silkwood Road will be retained.
PO6 Development is subservient to the surrounding natural environment in scale and intensity and is designed to be functional in a humid tropical rainforest environment.	AO6.1 The exterior finishes and colours of buildings are non-reflective and complement the colours of the surrounding vegetation and view shed.	Alternative solution It is proposed that all containerised equipment used in generation, storage and other non-solar array infrastructure will be of a suitable colour to blend with the landscape. Eucalypt pale green is the nominated colour for external walls and roofing requirements. The solar panel arrays are reflective by necessary design requirements. A visual amenity assessment, including glint and glare aspects, has determined that there are no direct viewsheds of this aspect from any residential or commercial facility, however the solar arrays will be visible to traffic on Silkwood Road. The proponent will engage commercial contractors to thicken the existing vegetation along Silkwood Road as a further visual barrier.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	<p>AO6.2</p> <p>The noise of generators is controlled by design, or the generator is enclosed within a sound insulated building with a residential approved muffler. The noise level generated is less than 65 dBA when measured from a distance of 7 metres.</p>	<p>Complies</p> <p>The main generator is a Jenbacher hydrogen gas type which is powered by hydrogen produced during the electrolysis process. The primary emission from the use of hydrogen gas as a fuel is water vapour, and is environmentally inert. Refer drawing DRE-CIV-GAR-1015.</p> <p>The backup emergency generator is an LPG generator which has significantly less carbon emissions than diesel or other fuel sources generators. The exhaust is specifically directed through carbon filters prior to discharge to an underground absorption sink with no direct atmospheric discharge. This is an emergency system only, e.g., during cyclones, and is not intended for use in any other capacity.</p> <p>Generators are located within specialised containment structures, and are sound proofed and silenced with noise generation to manufacturers specifications <65dBA from 7m. Nearest sensitive receptors is the residence on Lot 5 BK157130 >200m from the site and also shielded by dense vegetation on Buchanan Creek. Noise generation will comply with Schedule 1 <i>Environmental Protection (Noise) Policy 2019</i> for residences as sensitive receptors.</p>
	<p>AO6.3</p> <p>Any fuel storage associated with an on-site generator, with storage of 20 litres or more of fuel, is enclosed with a building and provided with a bund.</p>	<p>Complies</p> <p>The proposed 2MW backup generators are powered by LPG (not diesel) with 20 KL of storage proposed in a single tank to AS/NZS 1596:2008 standard <i>The storage and handling of LP Gas</i>. Fuel storage for LPG and hydrogen has been confirmed as not triggering</p>

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
		ERA requirements under the <i>Environment Protection Act 1994</i> (SARA 2208-30357 SPL) and are not classed as hazardous storage.
PO7 Landscaping of the development ensures that the endemic character of the local area is dominant.	AO7.1 Landscaping complies with the requirements of Planning Scheme Policy 7 – Landscaping;	Will comply The proponent will engage a commercial revegetation contractor to ensure that all vegetation planted as visual screening and for any other requirements comprises 100% endemic / native species.
	AO7.2 All of the existing landscaping to be retained and all of the proposed landscaping is 100% endemic or native species and the details are provided on a landscape plan.	Will comply Existing site is cleared, with native vegetation communities limited to Buchanan Creek (west and north of the site) and within the Silkwood Road reserve. Isolated trees are present along a drainage line within the site. It is not intended to interfere with any of these communities for the project. Vegetation along Silkwood Road will be retained and enhanced plantings using 100% endemic / native species by a commercial revegetation contractor will be undertaken.
PO8 Site access driveways and roads within the local plan area are retained as safe, slow speed, scenic drives.	AO8.1 Site access driveways and existing or proposed roads comply with the relevant requirements of Planning Scheme Policy 5 – FNQROC Development Manual and are maintained as low-speed gravel roads to maintain the scenic drive experience and to discourage the use of roads by through-traffic;	Complies Site access uses existing formed roads including Cape Tribulation Road, Buchanan Creek Road and Silkwood Road. The internal access off Silkwood Road is to be a private gravel road access and will traverse an unformed road reserve within the property. The access is designed to comply with the FNQROC Development Manual as a low speed gravel road. Refer drawings DRE-CIV-GAR-1021, DRE-ELE-GAR-1004
	AO8.2	Complies Site access will be via a private road constructed to

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	Where existing roads/tracks are 4-wheel drive only, upgrading to facilitate conventional vehicles and an increase in through traffic does not occur.	FNQROC Development Standards as a low speed gravel road. Access is only for construction and maintenance purposes and will not be open as a public (or private) throughfare.
PO9 The on-site impacts on natural flow regimes and erosion and sedimentation are minimised.	AO9.1 Filling and excavation is kept to a minimum and involves not more than 5% of the cleared area of the lot.	Complies Minimal filling and excavation are required for the solar farm construction with total earthworks (approximately 3000m ²) being less than 5% of the cleared area (approximately 8.5ha). Filling and excavation is limited primarily to construction of access road and site erosion and sediment control measures (including proposed drainage). All infrastructure is prefabricated, requiring only concrete/steel footings to support the containerised structures above the ground. Similarly, all the solar panels are placed on a single steel pole with precast concrete footings and are raised above the ground. Solar panels are connected to each other above ground, and do not require inground cabling to be connected, except for the underground connection (under existing road reserve) to the generation site. Refer drawings DRE-CIV-GAR-1021 and DRE-ELE-GAR-1002, DRE-ELE-GAR-1003, DRE-ELE-GAR-1004.
	AO9.2 All exposed surfaces must incorporate erosion and sediment controls during construction and must be maintained until revegetation, or other permanent stabilisation, has occurred.	Complies Drainage proposed and erosion and sediment control measures are identified in drawings DRE-CIV-GAR-1021 and DRE-ELE-GAR-1002, DRE-ELE-GAR-1003, DRE-ELE-GAR-1004. Refer also to the attached project EMP for further measures.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	AO9.3 This is no disturbance to tree roots and trenching does not involve any damage to tree roots.	Complies There is no requirement for disturbance to native vegetation. Site is cleared, with the nearest vegetation being 20m from the solar farm infrastructure (refer drawing DRE-ELE-GAR-1001 for surveyed tree line). No tree roots will be damaged by construction/ trenching operations on site. There are isolated trees previously retained for cattle shade camps within the solar array layout that will be removed.
	AO9.4 On-site drainage and stormwater management: (a) maintains natural flow regimes; (b) minimises impervious surfaces; (c) avoids concentration of flows, but where there is any form of concentration of flow, energy dissipation measures are installed at the outlet to avoid erosion (e.g. rock rip rap, gravel beds, diffusers etc.)	Complies Natural topographic profile of the site will not be altered and proposed drainage works will utilise existing natural flow paths. Access road will be gravel and maintain permeability. The small size of individual solar panels and clearance above the ground will ensure that runoff from individual panels does not concentrate flows and retains local ground permeability during rainfall events. Rainwater from impervious rooftop catchments will be directed to the onsite filtration and storage tank. Refer DRE-ELE-GAR-1002, DRE-ELE-GAR-1004, DRE-CIV-GAR-1021
General requirements – Dwelling house		
PO10 Development minimises the loss of vegetation and habitat connectivity on site and is sited to protect the environmental values of the site.	AO10.1 The elements of development and access to the site are included in a Designated Development Area (DDA).	Not applicable No dwelling proposed

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	AO10.2 Development is sited in an existing cleared area or in an area approved for vegetation clearing.	Not applicable No dwelling proposed
	AO10.3 Any new clearing is limited to a maximum area of 700m ² and is sited to be clear of the high bank of any watercourse. Note – The 700m ² of clearing does not include an access driveway.	Not applicable No dwelling proposed
PO11 All existing native vegetation on a house site, other than that required and approved to be cleared for the construction of a house and access thereto, is protected to ensure the environmental integrity of the local plan area.	AO11 No acceptable solutions are prescribed.	Not applicable No dwelling proposed
PO12 Wildlife movement, fauna habitat and habitat corridors are protected and domestic impacts are minimised.	AO12.1 Fences are limited in extent to the confines of the cleared area around the house and any associated gates are self-closing.	Not applicable No dwelling proposed
	AO12.2 External lighting is to be kept to the minimum necessary for orientation, safety and security. Flood lights must not point up, and areas of retained vegetation should, in general, not be illuminated. Where appropriate, outdoor lights are controlled by movement detectors and/or timers.	Not applicable No dwelling proposed

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
PO13 House sites have efficient and safe vehicle access and manoeuvring areas on site, and to the site, to an acceptable standard for the local plan area.	AO13.1 Vehicle access is limited to one access per lot and sited in an approved location, clear of any watercourses.	Not applicable No dwelling proposed
	AO13.2 Vehicular access is a maximum width of 4metres, avoids large tree specimens and/or significant vegetation and habitat corridors and is constructed and maintained to a minimum gravel standard of 75mm of road base on a compacted soil surface.	Not applicable No dwelling proposed
	AO13.3 Vehicular access is constructed prior to house construction.	Not applicable No dwelling proposed
Additional requirements for Nature based tourism, being Forest stay accommodation		
PO14 Forest stay accommodation provides a local economic opportunity for permanent residents of those parts of the Shire which are isolated and constrained by a lack of urban services and facilities.	AO14 Forest stay accommodation: (a) is confined to: (i) Precinct 2 – Low impact residential precinct; (ii) Precinct 5 – Low impact rural and tourism enterprise precinct; (iii) Precinct 6 – Low impact tourism accommodation precinct. (b) does not occur above the 60 metre contour; (c) is located on lots of 10 hectares or greater.	Not applicable No Forest stay accommodation proposed.
PO15 Forest stay accommodation remains ancillary to the primary residential use and the natural values	AO15.1 The maximum number of guests is 10 (10 bed spaces) with up to a maximum of 4 staff (4 bed spaces);	Not applicable No Forest stay accommodation proposed.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
of the land and the use is compatible with the character and amenity of the locality.	Note – Staff includes permanent residents of the dwelling house involved in catering for the use.	
	AO15.2 None of the accommodation, whether for guests or staff, is self-contained as the use operates only in association with an existing dwelling on the site.	Not applicable No Forest stay accommodation proposed.
	AO15.3 Forest stay accommodation is located on a site which has an existing cleared area.	Not applicable No Forest stay accommodation proposed.
	AO15.4 The natural values of the balance area of the site are protected and enhanced with organised tours being conducted for visiting guests.	Not applicable No Forest stay accommodation proposed.
	AO15.5 If forest stay accommodation is provided in buildings which are separate from the dwelling: (a) the maximum number of separate building/s is determined based on each building containing a minimum of 2 bed spaces each, provided that each building has a maximum area of 50m ² (inclusive of verandahs/patios etc.); or (b) a maximum of one communal bunkhouse is provided with a maximum area of 150m ² to accommodate 10 guests (10 bed spaces) (inclusive of verandahs/patios etc.); or	Not applicable No Forest stay accommodation proposed.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	(c) a maximum of two communal bunkhouses are provided with a maximum area of 150m ² each to accommodate a maximum of 20 guests (20 bed spaces) (inclusive of verandahs/patios etc).	
	AO15.6 No kitchen or cooking facilities, with the exception of those located within the existing dwelling on the site are provided in association with the forest stay accommodation.	Not applicable No Forest stay accommodation proposed.
PO16 Development ensures guests are accommodated for short-stay and the dwelling is not the usual residence of the guest.	AO16 Development involves guests staying a maximum of 14 consecutive nights.	Not applicable No Forest stay accommodation proposed.
PO17 Development ensures that effluent disposal and treatment minimise odour and impacts on the natural environment.	AO17 Development provides an on-site effluent treatment system that is adequately sized to effectively treat effluent from the dwelling house and any additional persons occupying the premises as guests.	Not applicable No Forest stay accommodation proposed.
Additional requirements for Precinct 1 – Conservation precinct		
PO18 The biodiversity value of the area and the habitat of endemic species is protected on land included in the Rainforest Conservation precinct.	AO18 No new development occurs whether on undeveloped or developed land except for: Undeveloped land that meets one or more of the following criteria: Land which has been previously been lawfully cleared and currently remains cleared; (a) Land which is the subject of a current	Not applicable Solar farm is not located within Precinct 1.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	<p>(b) Clearing Permit, but has yet to be cleared;</p> <p>(c) Land which is subject of a current Operational Works Permit, can be developed for a house subject to compliance with all relevant codes.</p> <p>In addition, minor extensions can be undertaken to an existing development, provided:</p> <p>(a) The extensions are limited to 30% of the existing gross floor area of the house at the commencement date of the planning scheme</p> <p>or</p> <p>(b) The extent of extensions are determined on a site specific/use specific basis for other land uses,</p> <p>or</p> <p>(c) No further clearing is required to accommodate the extension for either a house or any other land use development.</p>	
Additional requirements for Precinct 2– Low impact residential precinct		
PO19 Development is for; (a) a detached dwelling of limited size and scale and necessary outbuildings and infrastructure; (b) home occupations, including bed and breakfast accommodation, where it can be demonstrated that the bed and breakfast accommodation can establish on the site and	AO19.1 Development is limited to one dwelling house per lot.	Not applicable Solar farm is not located within Precinct 2
	AO19.2 Establishment of bed and breakfast accommodation only occurs on land on which a dwelling house has been approved and constructed.	Not applicable Solar farm is not located within Precinct 2.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
(c) not detrimentally impact on the scenic values of the site and surrounding areas; Nature based tourism, being Forest stay accommodation where in compliance with other requirements contained within this code.	AO19.3 Bed and breakfast accommodation is limited to cleared areas on the land; or	Not applicable Solar farm is not located within Precinct 2.
	AO19.4 Bed and breakfast accommodation is established within an existing house, where there is no additional vegetation clearing required to accommodate the use;	Not applicable Solar farm is not located within Precinct 2
	AO19.5 Bed and breakfast accommodation occurs on a site with a minimum area of 1 hectare, and thereafter occurs at a rate of 1 bedroom (2 beds) per hectare, up to a maximum of 4 bedrooms (8) beds per site.	Not applicable Solar farm is not located within Precinct 2.
	AO19.6 Development is setback a minimum of 100 metres to an Esplanade or a foreshore frontage.	Not applicable Solar farm is not located within Precinct 2.
Additional requirements for Precinct 3– Low impact commercial precinct		
PO20 Commercial development is located in a convenient location and meets the requirements of the local community and visitors to the area.	AO20 Commercial development is located within Precinct 3 and has frontage to Cape Tribulation Road.	Not applicable Solar farm is not located within Precinct 3.
PO21 Development is small scale and provides a necessary service to the surrounding community.	AO21 No acceptable outcomes are prescribed.	Not applicable Solar farm is not located within Precinct 3.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
PO22 Development is carried out in accordance with a site-specific, and development specific Environmental Management Plan. Note – Planning scheme policy SC6.4 – Environmental management plans provides further guidance on meeting the performance outcome.	AO22 No acceptable outcomes are prescribed.	Not applicable Solar farm is not located within Precinct 3.
Additional requirements for Precinct 4– Low impact community purpose precinct		
PO23 Development results in a small scale expansion of an existing use which provides a necessary service to the surrounding community; or Development results in a new community use or public purpose use for which there is an identified need within the surrounding community.	AO23 No acceptable outcomes are prescribed.	Not applicable Solar farm is not located within Precinct 4.
PO24 Development is carried out in accordance with a site specific and development specific Environmental Management Plan. Note – Planning scheme policy SC6.4 – Environmental management plans provide further guidance on meeting the performance outcome.	AO24 No acceptable outcomes are prescribed.	Not applicable Solar farm is not located within Precinct 4.
c		
PO25 Development complements, protects and enhances the environmental and scenic values of the site.	AO25.1 One dwelling house establishes per lot.	Complies No dwelling proposed for the solar farm. Workers accommodation will be a leased or purchased existing residence.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	AO25.2 Any other development is limited to existing cleared areas on the site.	Complies All construction and operational works are within existing cleared areas (grazing pasture).
	AO25.3 No development is to occur above the 60 metre contour line.	Complies All components of the solar farm are between 49m and 23m ASL.
	AO25.4 Any new primary production activity or a change to a primary production activity has minimal impact on the existing natural values of the site and surrounding area.	Complies Material Change of Use will result in primary production reverting to a electricity generation facility which has minimal environmental impact on natural values.
PO26 Large cleared or partially cleared sites are revegetated and rehabilitated in association with suitably small scale environmentally sustainable development.	AO26 The balance area of the development, including any existing area/s not identified for development is/are revegetated / rehabilitated in accordance with a landscape plan.	Complies Commercial revegetation contractors will be engaged to undertake revegetation works along Silkwood Road to enhance visual screening from traffic along this road. Additionally, existing isolated native trees along the drainage line will be retained, and where required, further rehabilitation of the drainage line with native species will be considered there will be no impact of these revegetation species on shading effects and efficiency of adjacent solar panels.
PO27 Development is carried out in accordance with a site specific and development specific Environmental Management Plan. Note – Planning scheme policy SC6.4 – Environmental management plans provides further guidance on meeting the performance outcome.	AO27 No acceptable outcomes are prescribed.	Complies An Environmental Management Plan has been prepared for this project and attached to this application.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
Additional requirements for Precinct 6 – Low impact tourism accommodation precinct		
PO28 Development complements, protects and enhances the environmental and scenic values of the site.	AO28.1 One dwelling house establishes per lot.	Not applicable Solar farm is not located within Precinct 6.
	AO28.2 Any other development is limited to existing cleared areas on the site.	Not applicable Solar farm is not located within Precinct 6.
	AO28.3 No development is to occur above the 60 metre contour line.	Not applicable Solar farm is not located within Precinct 6.
PO29 Development results in a small scale expansion of existing tourist accommodation and any associated activities, based on the appreciation of the natural environment.	AO29 No acceptable outcomes are prescribed.	Not applicable Solar farm is not located within Precinct 6.
PO30 Development is carried out in accordance with a site specific and development specific Environmental Management Plan.	AO30 No acceptable outcomes are prescribed.	Not applicable Solar farm is not located within Precinct 6.

7.2.2 Coastal communities local plan code

7.2.2.1 Application

- (1) This code applies to assessing development within the Coastal communities local plan area covering Wonga Beach, Newell and Cooya Beach as identified on the Coastal communities local plan maps contained in Schedule 2.

Response: Solar farm generation site,

The solar farm generation site is located within a lease on Lot 5 BK157130, Buchanan Creek Road, Cow Bay, and is not within the local plan area identified in local plan map LPM-003, Schedule 2.

7.2.3 Mossman local plan code

7.2.3.1 Application

- (1) This code applies to development within the Mossman local plan area as identified on the Mossman local plan maps contained in Schedule 2.

Response:

The solar farm generation site is located within a lease on Lot 5 BK157130, Buchanan Creek Road, Cow Bay, and is not within the Mossman and local plan area as identified in Local plan map LPM-004, Schedule 2

7.2.4 Port Douglas/Craigie local plan code

7.2.4.1 Application

- (1) This code applies to assessing development within the Port Douglas/Craigie local plan area as identified on the Port Douglas/Craigie local plan maps contained in Schedule 2.

Response:

The solar farm generation site is located within a lease on Lot 5 BK157130, Buchanan Creek Road, Cow Bay and is not within the Port Douglas/Craigie local plan map LPM-005 as identified in Schedule 2.

7.2.5 Return to Country Local Plan

7.2.5.1 Application

- (1) This code applies to assessing development within the Return to Country local plan area as identified in the Return to Country local plan maps contained in Schedule 2.

Response:

The solar farm generation site is located within a lease on Lot 5 BK157130, Buchanan Creek Road, Cow Bay and is not within or adjacent any Return to Country local plan precincts as identified in map LPM-007 identified in Schedule 2.

8.2 Overlay codes

8.2.1 Acid sulfate soils overlay code

Table 8.2.1.3.a – Acid sulfate soils overlay code – assessable development

Performance outcomes	Acceptable outcomes	Applicant Response
For assessable development		
PO1 The extent and location of potential or actual acid sulfate soils is accurately identified.	AO1.1 No excavation or filling occurs on the site. or	Complies No excavation or filling is proposed for areas in the northern section of the lease identified as being within the acid sulfate soil overlay.
	AO1.2 An acid sulfate soils investigation is undertaken. Note - Planning scheme policy SC 6.12– Potential and actual acid sulfate soils provides guidance on preparing an acid sulfate soils investigation.	Complies A geotechnical report has been undertaken for the solar farm generation site and has identified no PASS/ASS in the location. The geotechnical report is included as Appendix H.
PO2 Development avoids disturbing potential acid sulfate soils or actual acid sulfate soils, or is managed to avoid or minimise the release of acid and metal contaminants.	AO2.1 The disturbance of potential acid sulfate soils or actual acid sulfate soils is avoided by: (a) not excavating, or otherwise removing, soil or sediment identified as containing potential or actual acid sulfate soils; (b) not permanently or temporarily extracting groundwater that results in the aeration of previously saturated acid sulfate soils; (c) not undertaking filling that results in: (d) actual acid sulfate soils being moved below the water table; (e) previously saturated acid sulfate soils being aerated. or	Complies No actual or potential acid sulfate soils have been identified within the solar farm generation area and these soils will not be exposed as a result of development The geotechnical report is included as Appendix H.
	AO2.2 The disturbance of potential acid sulfate soils or	Complies No actual or potential acid sulfate soils have been

Performance outcomes	Acceptable outcomes	Applicant Response
	<p>actual acid sulfate soils is undertaken in accordance with an acid sulfate soils management plan and avoids the release of metal contaminants by:</p> <ul style="list-style-type: none"> (a) neutralising existing acidity and preventing the generation of acid and metal contaminants; (b) preventing the release of surface or groundwater flows containing acid and metal contaminants into the environment; (c) preventing the in situ oxidisation of potential acid sulfate soils and actual acid sulfate soils through ground water level management; (d) appropriately treating acid sulfate soils before disposal occurs on or off site; (e) documenting strategies and reporting requirements in an acid sulfate soils environmental management plan. <p>Note - Planning scheme policy SC 6.12 – Acid sulfate soils provides guidance on preparing an acid sulfate soils management plan.</p>	<p>identified within the solar farm generation area and these soils will not be exposed as a result of development</p> <p>The geotechnical report is included as Appendix H.</p>
<p>PO3</p> <p>No environmental harm is caused as a result of exposure to potential acid sulfate soils or actual acid sulfate soils.</p>	<p>AO3</p> <p>No acceptable outcomes are prescribed.</p>	<p>Complies</p> <p>No actual or potential acid sulfate soils have been identified within the solar farm generation area and these soils will not be exposed as a result of development</p> <p>The geotechnical report is included as Appendix H.</p>

8.2.2 Bushfire hazard overlay code

Note - Land shown on the bushfire hazard overlay map is designated as the bushfire prone area for the purposes of section 12 of the Building Regulations 2006. The bushfire hazard area (bushfire prone area) includes land covered by the high and medium hazard areas as well as the buffer area category on the overlay map.

8.2.2.1 Application

- (1) This code applies to assessing a material change of use, reconfiguring a lot, operational works or building work in the Bushfire hazard overlay, if:
 - (a) self-assessable or assessable where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;
 - (b) impact assessable development.
- (2) Land in the Bushfire hazard overlay is identified on the Bushfire hazard overlay map in Schedule 2 and includes the following sub-categories:
 - (a) Medium bushfire risk sub-category;
 - (b) High bushfire risk sub-category;
 - (c) Very high bushfire risk sub-category;
 - (d) Potential impact buffer sub-category.

Response:

No part of the lease area on Lot 5 BK157130, Buchanan Creek Road, is within any areas identified on the Bushfire Hazard Overlay Map Sheet – BH-005 and BH-008 in Schedule 2.

Note: Lot 5 BK157130, Buchanan Creek Road and the solar farm generation site lease area spans both map sheets.

8.2.3 Coastal environment overlay code

8.2.3.1 Application

- (1) This code applies to assessing a material change of use, reconfiguring a lot, operational work or building work within the Coastal environment overlay, if:
 - (a) self assessable or assessable development where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;
 - (b) impact assessable development.
- (2) Land in the Coastal hazard overlay is identified on the Coastal environment overlay map in Schedule 2 and includes the following sub-categories:
 - (a) Coastal management district sub-category;
 - (b) Erosion prone area sub-category.

Response:

No part of the lease area on Lot 5 BK157130, Buchanan Creek Road, is within any areas identified on the Coastal Process Overlay Map Sheet – CP-003 and CP-005 in Schedule 2.

Note: Lot 5 BK157130, Buchanan Creek Road and the solar farm generation site lease area spans both map sheets.

8.2.4 Flood and storm tide hazard overlay code

8.2.4.1 Application

- (1) This code applies to assessing a material change of use, reconfiguring a lot, operational work or building work within the Flood and storm tide hazard overlay, if:
 - (a) self assessable or assessable development where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;
 - (b) impact assessable development.
- (2) Land in the Flood and storm tide hazard overlay is identified on the Flood and storm tide hazard overlay map in Schedule 2 and includes the:
 - (a) Storm tide – high hazard sub-category;
 - (b) Storm tide – medium hazard sub-category;
 - (c) Flood plain assessment sub-category;
 - (d) 100 ARI Mossman, Port Douglas and Daintree Township Flood Studies sub-category.

Response:

No part of the lease area on Lot 5 BK157130, Buchanan Creek Road, is within any areas identified on the Flood and Storm Tide Inundation Overlay Map Sheets – FST-005 and FST-008 in Schedule 2.

Note: Lot 5 BK157130, Buchanan Creek Road and the solar farm generation site lease area spans both map sheets. .

8.2.5 Hillslopes overlay code

Table 8.2.5.3.a – Hillslopes overlay code –assessable development

Performance outcomes	Acceptable outcomes	Applicant response
For self-assessable development		
PO1 The landscape character and visual amenity quality of hillslopes areas is retained to protect the scenic backdrop to the region.	AO1.1 Development is located on parts of the site that are not within the Hillslopes constraint sub- category as shown on the Hillslopes overlay Maps contained in schedule 2.	Not applicable Applies only to self-assessable development.
For assessable development		
PO2 The landscape character and visual amenity quality of hillslopes areas is retained to protect the scenic backdrop to the region.	AO2.1 Development does not occur on land with a gradient in excess of 1 in 6 (16.6%) or	Complies No development is proposed on slopes steeper than 1 in 6.
	AO2.2 Where development on land steeper than 1 in 6 (16.6%) cannot be avoided, development follows the natural contours of the site.	Complies No development is proposed on slopes steeper than 1 in 6. All solar arrays will follow the natural contours of the site.
Performance outcomes	Acceptable outcomes	
	AO2.3 Access ways and driveways are: (a) constructed with surface materials that blend with the surrounding environment; (b) landscaped with dense planting to minimise the visual impact of the construction; (c) provided with erosion control measures immediately after construction.	Complies The access to the generation site is proposed to be formed gravel road constructed to standards identified in the FNQROC Development Manual, and with erosion control measures installed as per International Erosion Association Best Practice Guidelines and the FNQROC Development Manual, part 5. Refer drawings DRE-ELE-GAR-1004 and DRE-CIV-GAR-1021,

Performance outcomes	Acceptable outcomes	Applicant response
	AO2.4 The clearing or disturbance of vegetation is limited to clearing and disturbance that: <ul style="list-style-type: none"> (a) is necessary for the construction of driveways; (b) is necessary to contain the proposed development; (c) minimises canopy clearing or disturbance; (d) minimises riparian clearing or disturbance. 	Complies The solar farm generation has been historically cleared for cattle grazing. Isolated shade trees retained for cattle camps will be removed. Botanical assessments have determined that these are primarily successionist species and are not of regulated conservation significance.
	AO2.5 On land with slopes greater than 1 in 6 (16.6%) or greater, alternative construction methods to concrete slab on ground are utilised (i.e. split level or post and beam constructed buildings that minimise modification to the natural terrain of the land).	No applicable No construction will occur on slopes greater than 1 in 6 (16.6%).
	AO2.6 Development does not alter the sky line.	Complies None of the buildings and structures will protrude above the tree line. The tallest building is the containerised electrolyser unit, which is 4.61m tall. The telemetry/SCADA antennae mounted to the electrolyser unit is 7.5m tall. Average tree height in the surrounding areas is 8 to 10m with emergents to 12 to 15m. Refer drawing DRE-CIV-GAR-1012.
	AO2.7 Buildings and structures: <ul style="list-style-type: none"> (a) are finished predominantly in the following exterior colours or surfaces: <ul style="list-style-type: none"> (i) moderately dark to darker shades of olive green, brown, green, blue, or charcoal; or (ii) moderately dark to darker wood stains that blend with the colour and hues of the surrounding vegetation and landscape; 	Alternative solution The colours of buildings and structures will be sympathetic to the surrounding environmental amenity, with preferred colour being a eucalypt green for the containerised structures. The solar panels are functionally required to be reflective. The orientation of the solar panels has been chosen to maximise solar efficiency, and a glint and glare assessment has

Performance outcomes	Acceptable outcomes	Applicant response
	<p>(b) are not finished in the following exterior colours or surfaces:</p> <ul style="list-style-type: none"> (i) pastel or terracotta colours, reds, yellows, shades of white or beige, or other bright colours that do not blend with the surrounding vegetation and landscape; (ii) reflective surfaces. 	<p>determined that these will not be able to be seen, even from close proximity as the arrays are 2.6m above ground level and face upwards and to the north.</p> <p>Refer visual amenity assessment of the technical supporting document.</p>
	<p>AO2.8 Exterior colour schemes limit the use of white or other light colours to exterior trim and highlighting of architectural features.</p>	<p>Complies Exterior security lighting is required for the generation equipment and infrastructure. Security lighting at the solar farm will be installed as low as possible, use motion-sensing technology, be of shielded directional LED optics and preferably of amber or red output.</p>
	<p>AO2.9 Areas between the first floor (including outdoor deck areas) and ground level are screened from view.</p>	<p>Not applicable No two storey structures are proposed.</p>
	<p>AO2.10 Recreational or ornamental features (including tennis courts, ponds or swimming pools) do not occur on land:</p> <ul style="list-style-type: none"> (a) with a gradient of 1 in 6 (16.6%) or more; (b) are designed to be sited and respond to the natural constraints of the land and require minimal earthworks. 	<p>Not applicable No recreational or ornamental features are proposed.</p>

Performance outcomes	Acceptable outcomes	Applicant response
PO3 Excavation or filling does not have an adverse impact on the amenity, safety, stability or function of the site or adjoining premises through: <ul style="list-style-type: none"> (a) loss of privacy; (b) loss of access to sunlight; (c) intrusion of visual or overbearing impacts; (d) complex engineering solutions. 	AO3 Excavation or fill: <ul style="list-style-type: none"> (a) is not more than 1.2 metres in height for each batter or retaining wall; (b) is setback a minimum of 2 metres from property boundaries; (c) is stepped with a minimum 2 metre wide berm to incorporate landscaping in accordance with Planning scheme policy SC6.7 – Landscaping; (d) does not exceed a maximum of 3 batters and 3 berms (i.e. not greater than 3.6 metres in height) on any one lot. 	Complies No major earthworks are required for the project. Earthworks are required only for the access road and drainage controls. No batters or retaining walls are proposed, nor are there any berms or landscaping proposed.
Lot reconfiguration		
PO4 For development that involves reconfiguring a lot, lot layout and design is responsive to the natural constraints of the land and each lot is capable of being used for its intended purpose.	AO4.1 The frontage and depth of all lots is of sufficient width to: <ul style="list-style-type: none"> (a) allow driveways to follow the natural contours of the site and not exceed a gradient of 1 in 6 (16.6%); (b) accommodate any changes in gradient between the road and lot within the lot boundary and not within the road reserve. 	Complies Access to the solar farm generation site is off Silkwood Road, on flat to mildly sloping land, none of which exceeds a gradient of 1 in 6 (16.6%). There are no changes in gradient between Silkwood Road and the solar farm site within the lease boundary. Refer drawing DRE-CIV-GAR-1021,
	AO4.2 Development does not create new lots containing land of greater than 1 in 6 (16.6%), except where a rectangular area of land of lesser grade is contained within the new lots to accommodate the intended land use, with the balance left in its natural state to the greatest extent possible. Note – The size of rectangular areas is outlined within each zone code.	Complies No new lot is being created that includes gradients greater than 1 in 6 (16.6%),

Performance outcomes	Acceptable outcomes	Applicant response
	AO4.3 Development does not alter ridgelines.	Complies None of the buildings and structures will alter ridgelines The tallest building is the containerised electrolyser unit, which is 4.61m tall. The telemetry/SCADA antennae mounted to the electrolyser unit is 7.5m tall. Average tree height in the surrounding areas is 8 to 10m with emergents 12 to 15m. The solar farm itself is located in the valley of Buchanan Creek with no component on an existing ridge line. Refer drawing DRE-CIV-GAR-1012.
	AO4.4 Lots are designed to ensure rooflines of future buildings and structures do not protrude above a ridgeline.	Not applicable No future buildings and structures are proposed as part of the solar farm generation site.

8.2.6 Landscape values overlay code

Table 8.2.6.3.a – Landscape values overlay code – assessable development

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
Development in a High landscape value area		
PO1 Development within High landscape value areas identified on the Landscape values overlay maps contained in Schedule 2: (a) avoids detrimental impacts on the landscape values of forested skylines, visible hillslopes, ridgelines, the coastal foreshore or the	AO1.1 Buildings and structures are not more than 8.5 metres and two storeys in height. Note - Height is inclusive of roof height.	Complies None of the buildings and structures are taller than 8.5m in height, nor are any two storey buildings proposed. The tallest building is the containerised electrolyser unit, which is 4.61m tall. The telemetry/SCADA antennae mounted to the electrolyser unit is 7.5m tall. Average tree height in

Performance outcomes	Acceptable outcomes	Applicant response
<p>shoreline of other water bodies through the loss of vegetation;</p> <p>(b) is effectively screened from view from a road, lookout or other public place by an existing natural landform or native vegetation, or will be effectively screened by native vegetation within 3 years of construction;</p> <p>(c) retains existing vegetation and incorporates new landscaping to enhance existing vegetation and visually soften built form elements;</p> <p>(d) incorporates development of a scale, design, height, position on site, construction materials and external finishes that are compatible with the landscape values of the locality;</p> <p>(e) avoids detrimental impacts on landscape values and excessive changes to the natural landform as a result of the location, position on site, scale, design, extent and alignment of earthworks, roads, driveways, retaining walls and other on-ground or in-ground infrastructure;</p> <p>(f) avoids detrimental impacts on landscape values and views as a result of the location, position on site, scale, design and alignment of telecommunications facilities, electricity towers, poles and lines and other tall infrastructure;</p> <p>(g) extractive industry operations are avoided.</p> <p>Note - A visual impact assessment is undertaken in accordance with Planning scheme policy SC6.6 – Landscape values in order to satisfy performance outcomes.</p>		<p>the surrounding areas is 8 to 10m with emergents 12 to 15m. The solar farm itself is located in the valley of Buchanan Creek with no component on an existing ridge line.</p> <p>Refer drawings, DRE-CIV-GAR-1001, DRE-CIV-GAR-1012</p>
	<p>AO1.2</p> <p>Buildings and structures are setback not less than 50 metres from ridgelines or peaks.</p>	<p>Complies</p> <p>The solar farm generation site is located in the valley of Buchanan Creek between 20 and 47m ASL. The nearest ridgelines and peaks are those of the Alexandra Range, approximately 450m south of the solar farm,</p>
	<p>AO1.3</p> <p>Development is screened from view from roads or other public places by an existing natural landform or an existing native vegetation buffer.</p>	<p>Complies</p> <p>The solar farm generation site is not visible from any major public viewshed (e.g. Buchanan Creek Road) except for motorists/pedestrians/cyclists on Silkwood Road travelling to/from residences and accommodation places. Silkwood Road has an existing vegetation screen of natural vegetation and the project proponent is proposing to engage a commercial contractor to 'thicken' the existing roadside vegetation with native / endemic species to provide a greater screening effect.</p>
	<p>AO1.4</p> <p>Where development on land steeper than 1 in 6 (16.6%) cannot be avoided:</p> <p>(a) development follows the natural; contours of the site;</p> <p>(b) buildings are split level or suspended floor construction, or a combination of the two;</p> <p>(c) lightweight materials are used to areas with suspended floors.</p> <p>Note - Examples of suitable lightweight materials include timber or fibre cement boards or sheeting for walls and factory</p>	<p>Not applicable</p> <p>No development is proposed for land steeper than 1 in 6 (16.6%).</p>

Performance outcomes	Acceptable outcomes	Applicant response
	treated metal sheeting for walls and roofs.	
	<p>AO1.5 The external features, walls and roofs of buildings and structures have a subdued and non-reflective palette.</p> <p>Note - Examples of suitable colours include shades of green, olive green, blue green, grey green, green blue, indigo, brown, blue grey, and green yellow.</p>	<p>Alternative solution It is proposed that all containerised equipment used in generation, storage and other non-solar array infrastructure will be of a suitable colour to blend with the landscape. Eucalypt pale green is the nominated colour for external walls and roofing requirements..</p> <p>The solar panel arrays are reflective by necessary design requirements. A visual amenity assessment, including glint and glare aspects, has determined that there are no direct viewsheds of this aspect from any residential or commercial facility, however the solar arrays will be visible to traffic on Silkwood Road. The proponent will engage commercial contractors to thicken the existing vegetation along Silkwood Road as a further visual barrier.</p>
	<p>AO1.6 No clearing of native vegetation occurs on land with a slope greater than 1 in 6 (16.5%).</p>	<p>Complies No vegetation clearing is required within the solar farm generation site other than minor works for access from Silkwood Road, and isolated trees retained as shade camps within the lease area. None of the vegetation to be removed is on slopes greater than 1 in 6 (16.5%).</p>
	<p>AO1.7 Where for accommodation activities or reconfiguration of a lot in a High landscape value area, development demonstrates that the height, design, scale, positioning on-site, proposed construction materials and external finishes are compatible with the landscape values.</p> <p>Note - A visual impact assessment undertaken in accordance with Planning scheme policy SC6.6 – Landscape values may be required.</p>	<p>Complies</p>

Performance outcomes	Acceptable outcomes	Applicant response
	AO1.8 Advertising devices do not occur.	Not applicable No advertising devices proposed.
Development within the Medium landscape value area		
PO2 Development within Medium landscape value areas identified on the Landscape values overlay maps contained in Schedule 2: (a) avoids detrimental impacts on the landscape values of forested skylines, visible hillslopes, ridgelines, the coastal foreshore or the shoreline of other water bodies through the loss of vegetation; (b) is effectively screened from view from a road, lookout or other public place by an existing natural landform or native vegetation, or will be effectively screened by native vegetation within 5 years of construction; (c) retains existing vegetation and incorporates new landscaping to enhance existing vegetation and visually soften built form elements; (d) incorporates development of a scale, design, height, position on site, construction materials and external finishes that are compatible with the landscape values of the locality; (e) avoids detrimental impacts on landscape values and excessive changes to the natural landform as a result of the location, position on site, scale, design and alignment of earthworks, roads, driveways, retaining walls and other on-ground or in-ground infrastructure; (f) avoids detrimental impacts on landscape values and views as a result of the location,	AO2.1 Buildings and structures are not more than 8.5 metres and two storeys in height. Note - Height is inclusive of the roof height.	Not applicable The solar farm generation site is not within the Medium landscape values area..
	AO2.2 Development is screened from view from roads or other public places by an existing natural landform or an existing native vegetation buffer	Not applicable The solar farm generation site is not within the Medium landscape values area.
	AO2.3 Where development on land steeper than 1 in 6 (16.6%) cannot be avoided: (a) development follows the natural; contours of the site; (b) buildings are split level or suspended floor construction, or a combination of the two; (c) lightweight materials are used to areas with suspended floors. Note - Examples of suitable lightweight materials include timber or fibre cement boards or sheeting for walls and factory treated metal sheeting for walls and roofs.	Not applicable The solar farm generation site is not within the Medium landscape values area.
	AO2.4 The external features, walls and roofs of buildings and structures have a subdued and non-reflective palette. Note - Examples of suitable colours include shades of green, olive green, blue green, grey green, green blue, indigo, brown, blue grey, and green yellow.	Not applicable The solar farm generation site is not within the Medium landscape values area.

Performance outcomes	Acceptable outcomes	Applicant response
<p>position on site, scale, design and alignment of telecommunications facilities, electricity towers, poles and lines and other tall infrastructure;</p> <p>(g) extractive industry operations are avoided, or where they cannot be avoided, are screened from view.</p> <p>Note - A visual impact assessment is undertaken in accordance with Planning scheme policy SC6.6 – Landscape values in order to satisfy performance outcomes.</p>	<p>AO2.5 No clearing of native vegetation occurs on land with a slope greater than 1 in 6 (16.6%).</p> <p>AO2.6 Advertising devices do not occur.</p>	<p>Not applicable The solar farm generation site is not within the Medium landscape values area.</p> <p>Not applicable The solar farm generation site is not within the Medium landscape values area.</p>
Development within a Scenic route buffer / view corridor area		
<p>PO3 Development within a Scenic route buffer / view corridor area as identified on the Landscape values overlay maps contained in Schedule 2:</p> <p>(a) retains visual access to views of the surrounding landscape, the sea and other water bodies;</p> <p>(b) retains existing vegetation and incorporates landscaping to visually screen and soften built form elements whilst not impeding distant views or view corridors;</p> <p>(c) incorporates building materials and external finishes that are compatible with the visual amenity and the landscape character;</p> <p>(d) minimises visual impacts on the setting and views in terms of:</p> <p>(i) the scale, height and setback of buildings;</p>	<p>AO3.1 Where within a Scenic route buffer / view corridor area, the height of buildings and structures is not more than identified within the acceptable outcomes of the applicable zone code.</p>	<p>Not applicable The solar farm generation site is not within the Scenic route buffer / view corridor area.</p>
	<p>AO3.2 No clearing of native vegetation is undertaken within a Scenic route buffer area.</p>	<p>Not applicable The solar farm generation site is not within the Scenic route buffer / view corridor area.</p>
	<p>AO3.3 Where within a Scenic route buffer / view corridor area development is set back and screened from view from a scenic route by existing native vegetation with a width of at least 10 metres and landscaped in accordance with the requirements of the landscaping code</p>	<p>Not applicable The solar farm generation site is not within the Scenic route buffer / view corridor area.</p>

Performance outcomes	Acceptable outcomes	Applicant response
<p>(ii) the extent of earthworks and impacts on the landform including the location and configuration of access roads and driveways;</p> <p>(iii) the scale, extent and visual prominence of advertising devices.</p> <p>Note - A visual impact assessment is undertaken in accordance with Planning scheme policy SC6.6 – Landscape values in order to satisfy performance outcomes.</p>	<p>AO3.4 Development does not result in the replacement of, or creation of new, additional, or enlarged advertising devices.</p>	<p>Not applicable The solar farm generation site is not within the Scenic route buffer / view corridor area.</p>
Development within the Coastal scenery area		
<p>PO4 The landscape values of the Coastal scenery zone as identified on the Landscape values overlay maps contained in Schedule 2 are managed to integrated and limit the visual impact of development.</p> <p>Note - A visual impact assessment is undertaken in accordance with Planning scheme policy SC6.6 – Landscape values in order to satisfy performance outcomes.</p>	<p>AO4.1 The dominance of the natural character of the coast is maintained or enhanced when viewed from the foreshore.</p>	
	<p>AO4.2 Where located adjacent to the foreshore buildings and structures are setback: (a) Where no adjoining development, a minimum of 50 metres from the coastal high water mark and the setback area is landscaped with a native vegetation buffer that has a minimum width of 25 metres; or (b) Where there is adjoining development, setbacks will be consistent with that of adjoining buildings and structures, but not less than 10 metres from the coastal high water mark. The setback area is landscaped in accordance with the requirements of the Landscaping code.</p>	<p>Not applicable The solar farm generation site is not within the Coastal scenery area.</p>
	<p>AO4.3 Where separated from the foreshore by land contained within public ownership (e.g. unallocated State land, esplanade or other public open space), buildings and structures area</p>	<p>Not applicable The solar farm generation site is not within the Coastal scenery area.</p>

Performance outcomes	Acceptable outcomes	Applicant response
	<p>setback:</p> <p>(a) where no adjoining development, a minimum of 6 metres from the coastward property boundary. The setback area is landscaped in accordance with the requirements of the Landscaping code; or</p> <p>where there is adjoining development, setbacks will be consistent with that of adjoining buildings and structures. The setback area is landscaped in accordance with the requirements of the Landscaping code.</p>	
<p>P05</p> <p>Development is to maximise opportunities to maintain and/or enhance natural landscape values through the maintenance and restoration of vegetated buffers between development and coastal waters, where practical.</p> <p>Note – A visual impact assessment is undertaken in accordance with Planning scheme policy SC6.6 – Landscape values in satisfaction of a performance outcome.</p>	<p>A05</p> <p>No clearing of native vegetation is undertaken within a Coastal scenery area zone, except for exempt vegetation damage undertaken in accordance with the Vegetation management code</p>	<p>Not applicable</p> <p>The solar farm generation site is not within the Coastal scenery area.</p>

8.2.7 Natural areas overlay code

Table 8.2.7.3.a – Natural areas overlay code – assessable development

Performance outcomes	Acceptable outcomes	Applicants response
For self-assessable and assessable development		
Protection of matters of environmental significance		
PO1 Development protects matters of environmental significance.	AO1.1 Development avoids significant impact on the relevant environmental values. or	Complies Surveys have been undertaken of the solar farm development site. The vegetation boundaries have been accurately surveyed (see drawing DRE-ELE-GAR-1001). The surveys determined that no matters of state and/or local environmental significance are located within the development site for the solar farm. Following surveys, a 20m buffer is to be maintained (using existing cleared pasture) between all infrastructure of the solar farm. An area of approximately 0.34ha of native vegetation within the lease area has been similarly buffered from the development area and will be completely avoided.
	AO1.2 A report is prepared by an appropriately qualified person demonstrating to the satisfaction of the assessment manager, that the development site does not contain any matters of state and local environmental significance. or	Complies Ecological surveys of the DMG project area have been undertaken 2021 to 2023. This included all road reserves and the solar farm generation site. The purpose of the surveys was to inform the design team such that native vegetation clearing could be avoided for the construction and operation of the DMG project. The surveys determined that no matters of state and/or local environmental significance are located within the development site for the solar farm which is entirely cleared. Following surveys, a 20m buffer is to be maintained (using existing cleared pasture) between all infrastructure of the solar farm and the vegetation boundary. An area of approximately 0.34ha of native vegetation within the lease area has been similarly

Performance outcomes	Acceptable outcomes	Applicants response
		buffered from the development area and will be completely avoided. Refer drawing DRE-ELE-GAR-1001 and Appendix D Technical Descriptions of the Town Planning Report.
	AO1.3 Development is located, designed and operated to mitigate significant impacts on environmental values. For example, a report certified by an appropriately qualified person demonstrating to the satisfaction of the assessment manager, how the proposed development mitigates impacts, including on water quality, hydrology and biological processes.	Complies Surveys undertaken by ecologists between 2021 and 2023 ² determined that no matters of state and/or local environmental significance are located within the development site for the solar farm. Following the surveys, a 20m buffer is to be maintained (using existing cleared pasture) between all infrastructure of the solar farm and the vegetation boundary. Refer drawing DRE-ELE-GAR-1001 for buffers and setback distances.
Management of impacts on matters of environmental significance		
PO2 Development is located, designed and constructed to avoid significant impacts on matters of environmental significance.	AO2 The design and layout of development minimises adverse impacts on ecologically important areas by: (a) focusing development in cleared areas to protect existing habitat; (b) utilising design to consolidate density and preserve existing habitat and native vegetation; (c) aligning new property boundaries to maintain ecologically important areas; (d) ensuring that alterations to natural landforms, hydrology and drainage patterns on the development site do not negatively affect ecologically important areas; (e) ensuring that significant fauna habitats are protected in their environmental context;	Complies (a) The entirety of the development footprint within the solar farm generation area is in areas that have previously been cleared for cattle grazing. All existing habitats within and adjacent (e.g. Buchanan Creek riparian corridor), will remain outside the development area and will remain protected through the establishment of a 20m buffer of existing cleared area (pasture) between native vegetation and infrastructure. (b) An existing area of vegetation of approximately 0.34ha within the lease in the south-west corner has been isolated from the development area by a cleared (existing) buffer of 20m between infrastructure and the vegetation boundary. (c) The surveyed boundary of the lease area have been aligned with existing road reserve boundaries to the largest extent practical (Silkwood Road and an

Performance outcomes	Acceptable outcomes	Applicants response
	<p>and</p> <p>(f) incorporating measures that allow for the safe movement of fauna through the site.</p>	<p>internal unformed road reserve) and excludes ecologically important areas, i.e., the Buchanan Creek riparian area</p> <p>(d) The construction of the solar farm does not need any major earthworks that would alter landforms, hydrology and drainage regimes. A 20m buffer has been established between native vegetation and all development.</p> <p>(e) No native vegetation communities and their associated fauna habitats will be disturbed, with a buffer area established between native vegetation and all development.</p> <p>Refer drawing DRE-ELE-GAR-1001 for surveyed buffer areas and set backs between vegetation and infrastructure.</p> <p>(f) Security fencing and lighting is a statutory requirement for generation sites under the provisions of the <i>Electrical Safety Act 2002</i> and associated regulations. As the solar farm will be a registered generation station under the <i>Electricity Act 1994</i>, there are compulsory requirements related to site security and safety. The security fence will be designed in accordance with the requirements of ENA Doc-015 National Guideline for Prevention of Unauthorised Access to Electricity Infrastructure. This guideline is not exclusive, with the security fencing between 1.8 and 2.0m high, and will not incorporate barbed wire, razor wire, knot wire meshes, or similar that may entrap bats, birds, reptiles or any other vulnerable fauna.</p>

Performance outcomes	Acceptable outcomes	Applicants response
PO3 An adequate buffer to areas of state environmental significance is provided and maintained.	AO3.1 A buffer for an area of state environmental significance (Wetland protection area) has a minimum width of: (a) 100 metres where the area is located outside Urban areas; or (b) 50 metres where the area is located within a Urban areas. or	Not applicable There are no wetland protection areas identified as MSES within or adjacent the solar farm generation site.
	AO3.2 A buffer for an area of state environmental significance is applied and maintained, the width of which is supported by an evaluation of environmental values, including the function and threats to matters of environmental significance.	Complies A surveyed buffer distance of 20m has been established as per the requirements under the <i>Vegetation Management Act 1999</i> between regulated Category B vegetation (a Matter of State Environmental Significance – MSES) and the solar farm infrastructure. The vegetation boundary has been surveyed and the buffer zone (comprising cleared pasture) is shown in drawing DRE-ELE-GAR-1001.
PO4 Wetland and wetland buffer areas are maintained, protected and restored. Note – Wetland buffer areas are identified in AO3.1.	AO4.1 Native vegetation within wetlands and wetland buffer areas is retained.	Not applicable There are no wetlands or wetland buffer areas within or adjacent the solar farm generation site.
	AO4.2 Degraded sections of wetlands and wetland buffer areas are revegetated with endemic native plants in patterns and densities which emulate the relevant regional ecosystem.	Not applicable There are no wetlands or wetland buffer areas within or adjacent the solar farm generation site.
PO5 Development avoids the introduction of non-native pest species (plant or animal), that pose a risk to ecological integrity.	AO5.1 Development avoids the introduction of non-native pest species.	Will comply The DMG project EMP contains specific elements related to the management of biosecurity aspects for the project. This includes the adoption of pest and weed hygiene practices as set out in the EMP section 4.10 including vehicle and machinery washdowns and

Performance outcomes	Acceptable outcomes	Applicants response
		inspections (south of the Daintree River) by a certified biosecurity inspector, ongoing monitoring, and notification and controls where non-native pest species are detected. Refer EMP (Appendix G).
	AO5.2 The threat of existing pest species is controlled by adopting pest management practices for long-term ecological integrity.	Complies The DMG project EMP contains specific elements related to the management of biosecurity aspects for the project. This includes the adoption of pest and weed hygiene practices as set out in the EMP section 4.10. Refer EMP (Appendix G).
Ecological connectivity		
PO6 Development protects and enhances ecological connectivity and/or habitat extent.	AO6.1 Development retains native vegetation in areas large enough to maintain ecological values, functions and processes. and	Complies An area of approximately 0.34 ha is included within the lease in the south-west corner, however this has been excluded from development. A buffer of 20 from the edge of the vegetation to the closest infrastructure has been set in agreement with DoR between regulated vegetation and the solar farm infrastructures. . The retained area of native vegetation is contiguous with the Daintree National Park to the south of the project lease area. . The development footprint site has been cleared for cattle grazing, and only isolated trees retained as shade camps for cattle are present within this area. Refer drawing DRE-ELE-GAR-1001 for infrastructure layouts with respect to the surveyed tree line.
	AO6.2 Development within an ecological corridor rehabilitates native vegetation. and	Not applicable The solar farm generation site is not within nor includes any ecological corridors. Buchanan Creek is adjacent to the development but is not within the lease area.

Performance outcomes	Acceptable outcomes	Applicants response
	A06.3 Development within a conservation corridor mitigates adverse impacts on native fauna, feeding, nesting, breeding and roosting sites and native fauna movements.	Not applicable The solar farm generation site is not within nor includes any conservation corridors. Buchanan Creek is adjacent to the development but is not within the lease area.
PO7 Development minimises disturbance to matters of state environmental significance (including existing ecological corridors).	A07.1 Development avoids shading of vegetation by setting back buildings by a distance equivalent to the height of the native vegetation. and	Complies There is a functional requirement for solar arrays to avoid shading by vegetation. Subsequently all infrastructure has been set back from native vegetation a minimum of 20m. Surveys of native vegetation determined that the average height of the vegetation about the solar farm perimeter is approximately 8 to 12m with taller trees to 12m.. On the basis of the 1.5m x height of the tallest tree, the buffer distance was identified as approximately 18m however following the above advice, the Project Design team has amended the layout of the solar farm such that all new infrastructure (excluding the security fence, underground services and any access tracks needed) have been located a minimum of 20m away from the Category B remnant vegetation (as mapped).
	A07.2 Development does not encroach within 10 metres of existing riparian vegetation and watercourses.	Complies Buchanan Creek, the nearest declared waterway, is approximately 45m from the nearest proposed infrastructure and is outside the solar farm lease area. A 20m buffer of existing cleared land is maintained between the solar farm infrastructure and the regulated (Category B, of concern) riparian vegetation of Buchanan Creek under the requirements of the <i>Vegetation Management Act 1999</i> .. Refer Appendix D Technical Description and drawing no. DRE-ELE-GAR-1001.

Performance outcomes	Acceptable outcomes	Applicants response
Waterways in an urban area		
PO8 Development is set back from waterways to protect and maintain: (a) water quality; (b) hydrological functions; (c) ecological processes; (d) biodiversity values; (e) riparian and in-stream habitat values and connectivity; (f) in-stream migration.	AO8.1 Where a waterway is contained within an easement or a reserve required for that purpose, development does not occur within the easement or reserve; or	Not applicable The solar farm generation site is not within an urban area.
	AO8.2 Development does not occur on the part of the site affected by the waterway corridor. Note – Waterway corridors are identified within Table 8.2.7.3.b.	Not applicable The solar farm generation site is not within an urban area.
Waterways in a non-urban area		
PO9 Development is set back from waterways to protect and maintain: (a) water quality; (b) hydrological functions; (c) ecological processes; (d) biodiversity values; (e) riparian and in-stream habitat values and connectivity; (f) in-stream migration.	AO9 Development does not occur on that part of the site affected by a waterway corridor. Note – Waterway corridors are identified within Table 8.2.7.3.b.	Complies The solar farm generation site has been assessed by the Department of Agriculture and Fisheries for waterway barrier requirements. Prelodgment advice (Appendix A) from SARA has indicated that there are no waterways or waterway corridors within the solar farm generation site. Buchanan Creek, the nearest declared waterway, is approximately 45m from the nearest proposed infrastructure and is outside the solar farm lease area. Refer Appendix D, Technical Descriptions.

8.2.9 Potential landslide hazard overlay code

8.2.9.1 Application

- (1) This code applies to assessing a material change of use, reconfiguring a lot, operational work or building work within the Potential landslide hazard overlay; if
 - (a) self-assessable or assessable development where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;
 - (b) impact assessable development.
- (2) Land in the Potential landslip hazard overlay is identified on the Potential landslide hazard overlay maps in Schedule 2 and includes the following sub-categories:
 - (a) Places of potential landslide hazard sub-category.

Response:

No part of the lease area on Lot 5 BK157130, Buchanan Creek Road, is within any areas identified on the Potential Landslide Hazard Overlay Map Sheets – PLH-003 and PLH-005 in Schedule 2.

Note: Lot 5 BK157130, Buchanan Creek Road and the solar farm generation site lease area spans both map sheets

8.2.10 Transport network overlay code

Table 8.2.10.3.a – Transport network overlay code – assessable development

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
PO1 Development supports the road hierarchy for the region. Note -A Traffic impact assessment report prepared in accordance with Planning scheme policy SC6.10 - Parking and access is one way to demonstrate achievement of the Performance Outcomes.	AO1.1 Development is compatible with the intended role and function of the transport network as identified on the Transport network overlay maps contained in Schedule 2.	Complies Access to the solar farm generation site will be off Silkwood Road, a minor rural road under the Transport network (Road Hierarchy) Overlay Maps of Schedule 2. Use of the access and Silkwood Road post construction will be intermittent, for monitoring and maintenance / repairs at the solar farm.
	AO1.2 Development does not compromise the safety and efficiency of the transport network.	Complies Access to the solar farm generation site will only be required on an intermittent basis for maintenance/repairs and monitoring. The frequency of access by vehicles will not compromise the safety and efficiency of Silkwood Road with respect to use by pedestrians and residents along the road.
	AO1.3 Development is designed to provide access via the lowest order road, where legal and practicable access can be provided to that road.	Complies Access will be off Silkwood Road, a minor rural road under the Transport network (Road Hierarchy) Overlay Maps of Schedule 2. Use of the access post construction will be intermittent, for monitoring and maintenance / repairs at the solar farm. The solar farm generation site shares a common boundary with the Silkwood Road road reserve.
PO2 Transport infrastructure is provided in an integrated and timely manner.	AO2 Development provides infrastructure (including improvements to existing infrastructure) in accordance with:	Not applicable No transport infrastructure is proposed as part of the DMG project.

Performance outcomes	Acceptable outcomes	Applicant response
Note - A Traffic impact assessment report prepared in accordance with Planning scheme policy SC6.10 - Parking and access is one way to demonstrate achievement of the Performance Outcomes.	<p>(e) the Transport network overlay maps contained in Schedule 2; (a) any relevant Local Plan.</p> <p>Note – The Translink Public Transport Infrastructure Manual provides guidance on the design of public transport facilities.</p>	
<p>P03 Development involving sensitive land uses within a major transport corridor buffer area is located, designed and maintained to avoid or mitigate adverse impacts on amenity for the sensitive land use.</p>	<p>AO3 No acceptable outcomes are prescribed.</p> <p>Note – Part 4.4 of the Queensland Development Code provides requirements for residential building design in a designated transport noise corridor.</p>	<p>Not applicable The solar farm generation site does not involve a sensitive land use within a major transport corridor buffer area.</p>
<p>P04 Development does not compromise the intended role and function or safety and efficiency of major transport corridors.</p> <p>Note - A Traffic impact assessment report prepared in accordance with Planning scheme policy SC6.10 - Parking and access is one way to demonstrate achievement of the Performance Outcomes.</p>	<p>AO4.1 Development is compatible with the role and function (including the future role and function) of major transport corridors.</p>	<p>Not applicable The solar farm generation site is not within or adjacent a major transport corridor.</p>
	<p>AO4.2 Direct access is not provided to a major transport corridor where legal and practical access from another road is available.</p>	<p>Not applicable The solar farm generation site is within or adjacent a major transport corridor.</p>
	<p>AO4.3 Intersection and access points associated with major transport corridors are located in accordance with: (a) the Transport network overlay maps contained in Schedule 2; and (b) any relevant Local Plan.</p>	<p>Not applicable The solar farm generation site is not within or adjacent a major transport corridor.</p>
	<p>AO4.4 The layout of development and the design of the associated access is compatible with existing and future boundaries of the major transport corridor or major transport facility.</p>	<p>Not applicable The solar farm generation site is not within or adjacent a major transport corridor.</p>

Performance outcomes	Acceptable outcomes	Applicant response
Performance outcomes	Acceptable outcomes	
PO5 Development retains and enhances existing vegetation between a development and a major transport corridor, so as to provide screening to potential noise, dust, odour and visual impacts emanating from the corridor.	AO5 No acceptable outcomes are prescribed.	Not applicable The solar farm generation site is not within or adjacent a major transport corridor.
Pedestrian and cycle network		
PO6 Lot reconfiguration assists in the implementation of the pedestrian and cycle movement network to achieve safe, attractive and efficient pedestrian and cycle networks.	AO6.1 Where a lot is subject to, or adjacent to an element of the pedestrian and cycle Movement network (identified on the Transport network overlay maps contained in Schedule 2) the specific location of this element of the pedestrian and cycle network is incorporated in the design of the lot layout.	Not applicable The solar farm generation site is not within or adjacent a pedestrian and cycle movement network.
	AO6.2 The element of the pedestrian and cycle network is constructed in accordance with the Design Guidelines set out in Sections D4 and D5 of the Planning scheme policy SC6.5 – FNQROC Regional Development Manual.	Not applicable The solar farm generation site is not within or adjacent a pedestrian and cycle movement network.

9.3 Use codes

9.3.1 Animal keeping code

9.3.1.1 Application

- (1) This code applies to assessing development for Animal keeping if:
 - (a) assessable development where the code is an applicable code identified in the assessment criteria column of a table of assessment; or
 - (b) impact assessable development for animal keeping or an unidentified use of a similar nature.

Response:

Not applicable: The DMG project does not include any development for Animal keeping.

9.3.2 Caretaker's accommodation code

9.3.2.1 Application

- (1) This code applies to assessing development for Caretaker's accommodation if:
 - (a) assessable development where the code is an applicable code identified in the assessment criteria column of a table of assessment; or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any Caretaker's accommodation.

9.3.3 Centre activities code

9.3.3.1 Application

- (1) This code applies to assessing development for:
 - (a) for Centre activities; and
 - (b) all development in a Centre zone, if:
 - (i) if assessable development where the code is an applicable code identified in the assessment criteria column of a table of assessment; or
 - (ii) impact assessable.

Response:

Not applicable: The DMG project does not include any development related to Centre activities.

9.3.4 Child care centre code

9.3.4.1 Application

- (1) This code applies to assessing development for a Child care centre if:
 - (a) assessable development where the code is an applicable code identified in the assessment criteria column of a table of assessment; or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to Child care.

9.3.5 Community care centre code

9.3.5.1 Application

- (1) This code applies to assessing development for a Community care centre if:
 - (a) assessable development where the code is an applicable code identified in the assessment criteria column of a table of assessment; or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to Community care.

9.3.6 Community facilities code

9.3.6.1 Application

- (1) This code applies to assessing development for a use within the Community facilities activities group, if:
 - (a) self-assessable or assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to Community facilities.

9.3.7 Dual occupancy code

9.3.7.1 Application

- (1) This code applies to assessing development for a Dual occupancy, if:
 - (a) self-assessable or assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to Dual occupancy.

9.3.8 Dwelling house code

9.3.8.1 Application

- (1) This code applies to assessing development for a dwelling house, if:
 - (a) self-assessable or assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to Dwelling house.

9.3.9 Dwelling unit code

9.3.9.1 Application

- (1) This code applies to assessing development for a dwelling unit, if:
 - (a) self-assessable or assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to Dwelling unit.

9.3.10 Extractive industry code

9.3.10.1 Application

- (1) This code applies to assessing development for Extractive Industry, if:
 - (a) self-assessable or assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to extractive industry.

9.3.11 Home based business code

9.3.11.1 Application

- (1) This code applies to assessing development for Home based business, if:
 - (a) self-assessable or assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment or
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to home based business.

9.3.12 Industry activities code

Under Table 1 SC1.1.1 in Schedule 1 of the Planning Scheme, the solar farm generation site is identified a renewable energy facility and is addressed in the following table.

Table 9.3.12.3.a – Industry activities code –assessable development

Performance outcomes	Acceptable outcomes	Applicant response
For self-assessable and assessable development		
PO1 The site coverage of buildings ensures that there is sufficient area for the provision of services and landscaping and caters for flood storage in areas affected by flooding.	AO1 The site coverage is not more than 80%.	Complies The solar farm infrastructure comprises approximately 5.6ha of solar arrays, and 0.27 ha of generation equipment. This is approximately 70% coverage of the lease area.
PO2 Setbacks: (a) contribute to an attractive and consistent streetscape appearance; (b) provide for visible employee and customer car parking; (c) allow for landscape planting along street frontages; (d) minimise unusable spaces between buildings / boundaries.	AO2 Buildings, display areas and storage areas are set back: (a) 6 metres from the main road frontage; (b) 3 metres from any secondary road frontage; (c) where the site has a common boundary with land in an industry zone, the building is setback either: (i) zero metres from the side or rear boundary; or (ii) not less than 3 metres from the side or rear boundary. (d) where a site adjoins land other than an industry zone, the building is setback not less than 3 metres from the side or rear boundary.	Complies All infrastructure within the solar farm generation site is set back from all aspects identified under AO2.
Amenity		
PO3 The appearance of development provides a quality, legible appearance and workplace.	AO3.1 Pedestrian entrances to buildings are: (a) easily identifiable from the street and directly accessible from the car parking areas; (b) provided with sun and rain shelter a minimum of 900mm width immediately above the entryway.	Not applicable No pedestrian entrances are proposed.
	AO3.2 Ancillary office or sales space is orientated toward the street frontage and is provided with human scale elements (such as windows, doors, shading devices and variation of construction	Not applicable No ancillary office or sales space is proposed

Performance outcomes	Acceptable outcomes	Applicant response
	materials and colours).	
	A03.3 Customer car parking is located to the front or side of premises with clear and direct pedestrian access to the main customer building entry.	Not applicable No customer car parking is proposed.
	A03.4 Outdoor storage areas are not located forward of the building line.	Not applicable No outdoor storage areas are proposed.
	A03.5 Illumination is provided within parking and pedestrian areas during night time hours of operation.	Not applicable No parking and pedestrian areas are proposed.
	A03.6 Development provides clear and legible street numbering for the benefit of motorists.	Not applicable The site is not accessible by the public and street numbering not required.
	A03.7 Gates to a road frontage are sliding or open inwardly into the site.	Complies Gate details are shown in drawing DRE-CIV-GAR-1016
	A03.8 Development on a site greater than 2,500m ² incorporates on-site amenity areas for staff that: (a) provide seating and tables; (b) incorporates weather protection.	Not applicable No on site staff are required for the solar farm generation site.
Landscaping		
PO4 Landscaping is provided to: (a) enhance the appearance and amenity of the development; (b) contribute positively to the appearance of the	A04.1 At least 5% of the site is landscaped.	Not applicable No landscaping is proposed within the solar farm development footprint.

Performance outcomes	Acceptable outcomes	Applicant response
streetscape.	A04.2 A landscape strip not less than 2 metres is provided within the site along the road frontage.	Not applicable No landscaping is proposed within the solar farm development footprint.
	A04.3 Landscaped areas adjoining parking and manoeuvring areas are protected from vehicular encroachment by a 150mm high vertical concrete kerb or similar obstruction.	Not applicable No landscaping is proposed within the solar farm development footprint.
	A04.4 Planting is to consist of a combination of hardy tropical tree and spreading ground cover species in accordance with Planning scheme policy SC6.7 - Landscaping that will complement the scale of proposed development, without interfering with casual surveillance and sightlines.	Not applicable No landscaping is proposed within the solar farm development footprint.
	A04.5 Hardy tropical shrubs are provided in accordance with Planning scheme policy SC6.7 - Landscaping to screen bin storage and service areas.	Not applicable No landscaping is proposed within the solar farm development footprint.
	A04.6 Fencing along street frontages is more than 50% transparent.	Complies Security fencing will be between 1.8 and 2.0m high security fence , The security fence will be designed in accordance with the requirements of ENA Doc-015 National Guideline for Prevention of Unauthorised Access to Electricity Infrastructure. It will be a chain link type fence (e.g. cyclone fence) and transparent.

Performance outcomes	Acceptable outcomes	Applicant response
Services		
PO5 Development adequately takes into account the functional requirements of infrastructure needs and service of the use.	AO5 Design takes into account the potential need to provide: <ul style="list-style-type: none"> (a) space and access for trade waste connections to the sewer network; (b) waste and recyclable material storage areas; (c) storage tanks; (d) fire fighting booster pumps; (e) electrical infrastructure; (f) car parking, manoeuvring areas including loading facilities. 	Complies The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
Access and loading/unloading of goods		
PO6 The transport of goods and materials to and from sites does not adversely affect the movement of traffic on roads adjacent to the site.	AO6.1 All vehicles are contained within the site when loading and unloading.	Complies The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
	AO6.2 Manoeuvring area is provided on site to allow a Medium rigid vehicle to enter and exit the site in a forward gear.	Complies The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
	AO6.3 Site access is limited to one access point to each frontage.	Complies Only one access from Silkwood Road is proposed. The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
	AO6.4 Where a site has a frontage greater than 40 metres, two access points to the street frontage can be provided they are separated by a distance of not less than 10 metres.	Not applicable Only one access point to Silkwood Road is proposed.

9.3.13 Multiple dwelling, short term accommodation and retirement facility code

9.3.13.1 Application

- (1) This code applies to assessing development for a Multiple dwelling, short term accommodation residential care facility or retirement facility if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to a Multiple dwelling, short term accommodation residential care facility or retirement facility.

9.3.14 Parking station code

9.3.14.1 Application

- (1) This code applies to assessing development for a parking station if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to a parking station.

9.3.15 Relocatable home park and tourist park code

9.3.15.1 Application

- (1) This code applies to assessing development for a Relocatable Home Park and Tourist park code if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to a relocatable home park and tourist park.

9.3.16 Rooming accommodation code

9.3.16.1 Application

- (1) This code applies to assessing development for Rooming accommodation if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to rooming accommodation.

9.3.17 Rural activities code

9.3.17.1 Application

- (1) This code applies to assessing development for Rural activities if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project is not identified as a defined activity group listed in Table 1 SC1.1.1.2 of Schedule 1. No rural activities are proposed for the project.

9.3.18 Sales office code

9.3.18.1 Application

- (1) This code applies to assessing development for a Sales office if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to a sales office.

9.3.19 Service station code

9.3.19.1 Application

- (1) This code applies to assessing development for a Service station if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to a service station.

9.3.20 Sport and recreation activities code

9.3.20.1 Application

- (1) This code applies to assessing development for Sport and recreation activities if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to sport and recreation activities.

9.3.21 Telecommunications facility code

9.3.21.1 Application

- (1) This code applies to assessing development for a Telecommunications facility if:
 - (a) assessable development where this code is an applicable code identified in the assessment criteria column of a table of assessment for a material change of use;
 - (b) impact assessable development.

Response:

Not applicable: The DMG project does not include any development related to a telecommunications facility.

9.4 Use codes

9.4.1 Access, parking and servicing code

Table 9.4.1.3.a – Access, parking and servicing code – assessable development

Performance outcomes	Acceptable outcomes	Applicants response
For self-assessable and assessable development		
PO1 Sufficient on-site car parking is provided to cater for the amount and type of vehicle traffic expected to be generated by the use or uses of the site, having particular regard to: <ul style="list-style-type: none"> (a) the desired character of the area; (b) the nature of the particular use and its specific characteristics and scale; (c) the number of employees and the likely number of visitors to the site; (d) the level of local accessibility; (e) the nature and frequency of any public transport serving the area; (f) whether or not the use involves the retention of an existing building and the previous requirements for car parking for the building (g) whether or not the use involves a heritage building or place of local significance; (h) whether or not the proposed use involves the retention of significant vegetation. 	AO1.1 The minimum number of on-site vehicle parking spaces is not less than the number prescribed in Table 9.4.1.3.b for that particular use or uses. Note - Where the number of spaces calculated from the table is not a whole number, the number of spaces provided is the next highest whole number.	Not applicable No specific vehicle parking areas are proposed for the solar farm generation site.
	AO1.2 Car parking spaces are freely available for the parking of vehicles at all times and are not used for external storage purposes, the display of products or rented/sub-leased.	Not applicable No specific vehicle parking areas are proposed for the solar farm generation site.

Performance outcomes	Acceptable outcomes	Applicants response
	AO1.3 Parking for motorcycles is substituted for ordinary vehicle parking to a maximum level of 2% of total ordinary vehicle parking.	Not applicable No specific vehicle parking areas are proposed for the solar farm generation site.
	AO1.4 For parking areas exceeding 50 spaces parking, is provided for recreational vehicles as a substitute for ordinary vehicle parking to a maximum of 5% of total ordinary vehicle parking rate.	Not applicable No specific vehicle parking areas are proposed for the solar farm generation site.
PO2 Vehicle parking areas are designed and constructed in accordance with relevant standards.	AO2 Vehicle parking areas are designed and constructed in accordance with Australian Standard: (a) AS2890.1; (b) AS2890.3; (c) AS2890.6.	Not applicable No specific vehicle parking areas are proposed for the solar farm generation site. Vehicle access will be intermittent and for the purposes of monitoring systems, maintenance and repairs with the vehicle parking to be appropriate to the location of the work area.
PO3 Access points are designed and constructed: (a) to operate safely and efficiently; (b) to accommodate the anticipated type and volume of vehicles (c) to provide for shared vehicle (including cyclists) and pedestrian use, where appropriate; (d) so that they do not impede traffic or pedestrian movement on the adjacent road area; (e) so that they do not adversely impact upon existing intersections or future road or intersection improvements; (f) so that they do not adversely impact current and future on-street parking arrangements; (g) so that they do not adversely impact on existing services within the road reserve adjacent to the site; (h) so that they do not involve ramping,	AO3.1 Access is limited to one access cross over per site and is an access point located, designed and constructed in accordance with: (a) Australian Standard AS2890.1; (b) Planning scheme policy SC6.5 – FNQROC Regional Development Manual - access crossovers.	Complies One access from Silkwood Road is proposed that will be constructed in accordance with the FNQROC Regional Development Manual - access crossovers. The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
	AO3.2 Access, including driveways or access crossovers: (a) are not placed over an existing: (i) telecommunications pit; (ii) stormwater kerb inlet; (iii) sewer utility hole; (iv) water valve or hydrant. (b) are designed to accommodate any adjacent footpath; (c) adhere to minimum sight distance requirements in accordance with AS2980.1.	Complies The access from Silkwood Road does not cross over on any of the aspects listed in AO3.2. The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.

Performance outcomes	Acceptable outcomes	Applicants response
cutting of the adjoining road reserve or any built structures (other than what may be necessary to cross over a stormwater channel).		
	AO3.3 Driveways are: (a) designed to follow as closely as possible to the existing contours, but are no steeper than the gradients outlined in Planning scheme policy SC6.5 – FNQROC Regional Development Manual; (b) constructed such that where there is a grade shift to 1 in 4 (25%), there is an area with a grade of no more than 1 in 6 (16.6%) prior to this area, for a distance of at least 5 metres; (c) on gradients greater than 1 in 6 (16.6%) driveways are constructed to ensure the cross-fall of the driveway is one way and directed into the hill, for vehicle safety and drainage purposes; (d) constructed such that the transitional change in grade from the road to the lot is fully contained within the lot and not within the road reserve; (e) designed to include all necessary associated drainage that intercepts and directs storm water runoff to the storm water drainage system.	Complies The access from Silkwood Road to the solar generation infrastructure will be a formed gravel road, constructed in accordance with the guidelines of the FNQROC Regional Development Manual; The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
	AO3.4 Surface construction materials are consistent with the current or intended future streetscape or character of the area and contrast with the surface construction materials of any adjacent footpath.	Complies The access from Silkwood Road to the solar generation infrastructure will be a formed gravel road, constructed in accordance with the guidelines of the FNQROC Regional Development Manual; The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.

Performance outcomes	Acceptable outcomes	Applicants response
PO4 Sufficient on-site wheel chair accessible car parking spaces are provided and are identified and reserved for such purposes.	AO4 The number of on-site wheel chair accessible car parking spaces complies with the rates specified in AS2890 Parking Facilities.	Not applicable No parking areas are proposed for disability access.
PO5 Access for people with disabilities is provided to the building from the parking area and from the street.	AO5 Access for people with disabilities is provided in accordance with the relevant Australian Standard.	Not applicable No parking areas are proposed for disability access.
PO6 Sufficient on-site bicycle parking is provided to cater for the anticipated demand generated by the development.	AO6 The number of on-site bicycle parking spaces complies with the rates specified in Table 9.4.1.3.b.	Not applicable No bicycle parking proposed.
PO7 Development provides secure and convenient bicycle parking which: (a) for visitors is obvious and located close to the building's main entrance; (b) for employees is conveniently located to provide secure and convenient access between the bicycle storage area, end-of-trip facilities and the main area of the building; (c) is easily and safely accessible from outside the site.	AO7.1 Development provides bicycle parking spaces for employees which are co-located with end-of-trip facilities (shower cubicles and lockers);	Not applicable No bicycle parking proposed.
	AO7.2 Development ensures that the location of visitor bicycle parking is discernible either by direct view or using signs from the street.	Not applicable No bicycle parking proposed.
	AO7.3 Development provides visitor bicycle parking which does not impede pedestrian movement.	Not applicable No bicycle parking proposed.
PO8 Development provides walking and cycle routes through the site which: (a) link to the external network and pedestrian and cyclist destinations such as schools, shopping centres, open space, public transport stations, shops and local activity centres along the safest, most direct and convenient routes; (b) encourage walking and cycling;	AO8 Development provides walking and cycle routes which are constructed on the carriageway or through the site to: (a) create a walking or cycle route along the full frontage of the site; (b) connect to public transport and existing cycle and walking routes at the frontage or boundary of the site.	Not applicable No walking or cycle routes are proposed to be constructed, nor will any existing routes be impacted by the solar farm generation site.

Performance outcomes	Acceptable outcomes	Applicants response
(c) ensure pedestrian and cyclist safety.		
PO9 Access, internal circulation and on-site parking for service vehicles are designed and constructed: (a) in accordance with relevant standards; (b) so that they do not interfere with the amenity of the surrounding area; (c) so that they allow for the safe and convenient movement of pedestrians, cyclists and other vehicles.	AO9.1 Access driveways, vehicle manoeuvring and on-site parking for service vehicles are designed and constructed in accordance with AS2890.1 and AS2890.2.	Complies The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
	AO9.2 Service and loading areas are contained fully within the site.	Complies All service and maintenance activities will be fully contained within the solar farm generation site.
	AO9.3 The movement of service vehicles and service operations are designed so they: (a) do not impede access to parking spaces; do not impede vehicle or pedestrian traffic movement.	Complies All service and maintenance vehicles will access the solar farm off Silkwood Road and will not impede any vehicle or pedestrian movement.

Performance outcomes	Acceptable outcomes	Applicants response
PO10 Sufficient queuing and set down areas are provided to accommodate the demand generated by the development.	AO10.1 Development provides adequate area on-site for vehicle queuing to accommodate the demand generated by the development where drive through facilities or drop-off/pick-up services are proposed as part of the use, including, but not limited to, the following land uses: (a) car wash; (b) child care centre; (c) educational establishment where for a school; (d) food and drink outlet, where including a drive-through facility; (e) hardware and trade supplies, where including a drive-through facility; (f) hotel, where including a drive-through facility; (g) service station.	Not applicable The solar farm generation site will not create any traffic demand for parking. Vehicle access will be intermittent, and solely for the purpose of maintenance, repair, and systems monitoring. Subsequently no formal parking and set down areas are proposed owing to the specific functional nature of vehicles using the site. The road layout proposed with respect to solar farm infrastructure is shown in drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1004.
	AO10.2 Queuing and set-down areas are designed and constructed in accordance with AS2890.1.	Not applicable No queuing and set down areas are proposed.

9.4.2 Advertising devices code

9.4.2.1 Application

- (1) This code applies to assessing:
 - (a) Applications for advertising devices, whether they are associated with material change of use application or are a separate application for operational works:
 - (b) Impact assessable development, to the extent relevant

Response:

Not applicable: The DMG project does not include any development related to advertising devices.

9.4.3 Environmental performance code

The environmental performance code is addressed in the following table.

Table 9.4.3.3.a Environmental performance code – assessable development

Performance outcomes		Acceptable outcomes
Lighting		
PO1 Lighting incorporated within development does not cause an adverse impact on the amenity of adjacent uses and nearby sensitive land uses.	AO1.1 Technical parameters, design, installation, operation and maintenance of outdoor lighting comply with the requirements of Australian standard AS4282-1997 Control of the obtrusive effects of outdoor lighting.	Complies Exterior security lighting is required for the generation equipment and infrastructure. Security lighting at the solar farm will be installed as low as possible, use motion-sensing technology, be of shielded directional LED optics and preferably of amber or red output and comply with Australian standard AS4282-1997
	AO1.2 Development that involves flood lighting is restricted to a type that gives no upward component of light where mounted horizontally.	Complies No flood lighting is proposed for the solar farm generation site.
	AO1.3 Access, car parking and manoeuvring areas are designed to shield nearby residential premises from impacts of vehicle headlights.	Complies No lighting is proposed for the access or manoeuvring areas and no car parking is proposed..
Noise		
PO2 Potential noise generated from the development is avoided through design, location and operation of the activity. Note – Planning Scheme Policy SC6.4 – Environmental management plans provides guidance on preparing a report to demonstrate compliance with the purpose and outcomes of the code	AO2.1 Development does not involve activities that would cause noise related environmental harm on nuisance. or environmental harm or nuisance with respect to surrounding land uses.	Complies Solar farm components and operations are generally of low intensity owing to the solid state nature of much of the infrastructure. The main generator is a Jenbacher hydrogen gas type which is powered by hydrogen produced during the electrolysis process. The primary emission from the use of hydrogen gas as a fuel is water vapour, and is environmentally inert. Refer drawing DRE-CIV-GAR-1015. The backup emergency generator is an LPG generator which has significantly less carbon emissions than diesel or other fuel sources generators. The exhaust

Performance outcomes	Acceptable outcomes	
		<p>is specifically directed through carbon filters prior to discharge to an underground absorption sink with no direct atmospheric discharge. This is an emergency system only, e.g. during cyclones, and is not intended for use in any other capacity.</p> <p>Generators are located within specialised containment structures, and are sound proofed and silenced with noise generation to manufacturers specifications <65dBA from 7m. Nearest sensitive receptors is the residence on Lot 5 BK157130 >200m from the site and also shielded by dense vegetation on Buchanan Creek. Noise generation will comply with Schedule 1 <i>Environmental Protection (Noise) Policy 2019</i> for residences as sensitive receptors.</p>
	<p>AO2.2</p> <p>Development ensures noise does not emanate from the site through the use of materials, structures and architectural features to not cause an adverse noise impact on adjacent uses</p>	<p>Complies</p> <p>Generators are located within specialised containment structures, and are sound proofed and silenced with noise generation to manufacturers specifications <65dBA from 7m. Nearest sensitive receptors is the residence on Lot 5 BK157130 >200m from the site and also shielded by dense vegetation on Buchanan Creek. Noise generation will comply with Schedule 1 <i>Environmental Protection (Noise) Policy 2019</i> for residences as sensitive receptors.</p>
	<p>AO2.3</p> <p>The design and layout of development ensures car parking areas avoid noise impacting directly on adjacent sensitive land uses through one or more of the following:</p> <ul style="list-style-type: none"> (a) car parking is located away from adjacent sensitive land uses; (b) car parking is enclosed within a building; (c) a noise ameliorating fence or structure is established adjacent to car parking areas 	<p>Not applicable</p> <p>No car parking areas proposed as part of the development of the solar farm generation site.</p>

Performance outcomes		Acceptable outcomes
		<p>where the fence or structure will not have a visual amenity impact on the adjoining premises;</p> <p>(d) buffered with dense landscaping.</p> <p>Editor's note - The <i>Environmental Protection (Noise) Policy 2008</i>, Schedule 1 provides guidance on acoustic quality objectives to ensure environmental harm (including nuisance) is avoided.</p>
Airborne particles and other emissions		
<p>PO3</p> <p>Potential airborne particles and emissions generated from the development are avoided through design, location and operation of the activity.</p> <p>Note – Planning Scheme Policy SC6.4 – Environmental management plans provides guidance on preparing a report to demonstrate compliance with the purpose and outcomes of the code.</p>	<p>AO3.1</p> <p>Development does not involve activities that will result in airborne particles or emissions being generated;</p> <p>or</p>	<p>Complies</p> <p>There are minimal components of the generation infrastructure that will generates particles or emissions. Electric magnetic fields, i.e, the magnetic flux of the infrastructure (EMF), is completely shielded in all components and poses no environmental risk.</p> <p>The main generator is a Jenbacher hydrogen gas type which is powered by hydrogen produced during the electrolysis process. The primary emission from the use of hydrogen gas as a fuel is water vapour, and is environmentally inert. Refer drawing DRE-CIV-GAR-1015.</p> <p>The backup emergency generator is an LPG generator which has significantly less carbon emissions than diesel or other fuel sources generators. The exhaust is specifically directed through carbon filters prior to discharge to an underground absorption sink with no direct atmospheric discharge. This is an emergency system only, e.g. during cyclones, and is not intended for use in any other capacity.</p>

Performance outcomes	Acceptable outcomes	
	<p>AO3.2</p> <p>The design, layout and operation of the development activity ensures that no airborne particles or emissions cause environmental harm or nuisance.</p> <p>Note - examples of activities which generally cause airborne particles include spray painting, abrasive blasting, manufacturing activities and car wash facilities.</p> <p>Examples of emissions include exhaust ventilation from basement or enclosed parking structures, air conditioning/refrigeration ventilation and exhaustion</p> <p>The <i>Environmental Protection (Air) Policy 2008</i>, Schedule 1 provides guidance on air quality objectives to ensure environmental harm (including nuisance) is avoided.</p>	<p>Complies</p> <p>There are minimal components of the solar farm infrastructure that will generate particles or emissions. Electric magnetic fields, i.e, the magnetic flux of the infrastructure (EMF), is completely shielded in all components and poses no environmental risk.</p> <p>The main generator is a Jenbacher hydrogen gas type which is powered by hydrogen produced during the electrolysis process. The primary emission from the use of hydrogen gas as a fuel is water vapour, and is environmentally inert. Refer drawing DRE-CIV-GAR-1015.</p> <p>The backup emergency generator is an LPG generator which has significantly less carbon emissions than diesel or other fuel sources generators. The exhaust is specifically directed through carbon filters prior to discharge to an underground absorption sink with no direct atmospheric discharge. This is an emergency system only, e.g. during cyclones, and is not intended for use in any other capacity.</p>
Odours		
<p>PO4</p> <p>Potential odour causing activities associated with the development are avoided through design, location and operation of the activity.</p> <p>Note – Planning Scheme Policy SC6.4 – Environmental management plans provides guidance on preparing a report to demonstrate compliance with the purpose and outcomes of the code.</p>	<p>AO4.1</p> <p>The development does not involve activities that create odorous emissions;</p> <p>or</p>	<p>Complies</p> <p>There are no components of the proposed works that create odorous emissions.</p>
	<p>AO4.2</p> <p>The use does not result in odour that causes environmental harm or nuisance with respect to surrounding land uses.</p>	<p>Complies</p> <p>There are no components of the proposed works that create odorous emissions.</p>

Performance outcomes		Acceptable outcomes	
Waste and recyclable material storage			
PO5 Waste and recyclable material storage facilities are located and maintained to not cause adverse impacts on adjacent uses. 			

Performance outcomes		Acceptable outcomes
Sensitive land use activities		
PO6 Sensitive land use activities are not established in areas which will receive potentially incompatible impacts on amenity from surrounding, existing development activities and land uses	AO6.1 Sensitive land use activities are not established in areas that will be adversely impacted upon by existing land uses, activities and potential development possible in an area; or	Complies The solar farm generation infrastructure is not listed as a sensitive land use activity under the DSC Planning Scheme.
	AO6.2 Sensitive land activities are located in areas where potential adverse amenity impacts mitigate all potential impacts through layout, design, operation and maintenance.	Complies The solar farm generation infrastructure is not listed as a sensitive land use activity under the DSC Planning Scheme.
Stormwater quality		
PO7 The quality of stormwater flowing over, through or being discharged from development activities into watercourses and drainage lines is of adequate quality for downstream environments, with respect to: (a) the amount and type of pollutants borne from the activity; (b) maintaining natural stream flows; (c) the amount and type of site disturbance; (d) site management and control measures	AO7.3 Soil and water control measures are incorporated into the activity's design and operation to control sediment and erosion potentially entering watercourses, drainage lines and downstream receiving waters. Note - Planning scheme policy - FNQROC Regional Development Manual provides guidance on soil and water control measures to meet the requirements of the <i>Environmental Protection Act 1994</i> . During construction phases of development, contractors and builders are to have consideration in their work methods and site preparation for their environmental duty to protect stormwater quality.	Complies A drainage and slope assessment has been undertaken to inform the erosion and sediment control measures necessary to control overland stormwater. Additionally the project EMP requires all contractors to develop an Erosion and Sediment Control Plan (ESCP) compliant with the International Erosion Control Association (IECA) guidelines, the WTMA "Roads in the Wet Tropics" best practice guideline, and the FNQROC Regional Development Manual.. The design of the works has specifically taken into account minimal earthworks and no vegetation clearing being required. No waterway bed, banks or riparian areas will be disturbed by the project construction, and there will be no ongoing environmental effects after completion of the installation of the generation infrastructure.

Performance outcomes	Acceptable outcomes	
		Stormwater and erosion / sediment controls for the solar farm generation site are identified in drawing DRE-ELE-GAR-1004, DRE-ELE-GAR-1002, DRE-CIV-GAR-1021;
Pest plants (for material change of use on vacant land over 1,000m²)		
<p>PO8 Development activities and sites provide for the removal of all pest plants and implement ongoing measures to ensure that pest plants do not reinfest the site or nearby sites.</p> <p>Editor's note - This does not remove or replace all land owner's obligations or responsibilities under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i>.</p>	<p>AO8.1 The land is free of declared pest plants before development establishes new buildings, structures and practices; or</p>	<p>Complies The solar farm development site has been surveyed for presence of declared pest plants. The site is currently 100% pasture comprising introduced improved pasture species (<i>Brachiaria</i> sp). There are occasional native trees which are established as cattle shade camps. The site will be resurveyed prior to the start of works.</p>
	<p>AO8.2 Pest plants detected on a development site are removed in accordance with a management plan prepared by an appropriately qualified person prior to construction of buildings and structures or earthworks.</p> <p>Note - A declaration from an appropriately qualified person validates the land being free from pest plants.</p> <p>Declared pest plants include locally declared and State declared pest plants.</p>	<p>Will comply Currently there are no pest plant species within the solar farm development site as of surveys June 2023. The site will be resurveyed prior to the start of works.</p>

9.4.4 Filling and excavation code

Table 9.4.4.3.a – Filling and excavation code – for self-assessable and assessable development

Performance outcomes	Acceptable outcomes	Applicant response
For self-assessable and assessable development		
Filling and excavation - General		
PO1 All filling and excavation work does not create a detrimental impact on the slope stability, erosion potential or visual amenity of the site or the surrounding area.	AO1.1 The height of cut and/or fill, whether retained or not, does not exceed 2 metres in height. and Cuts in excess of those stated in A1.1 above are separated by benches/ terraces with a minimum width of 1.2 metres that incorporate drainage provisions and screen planting.	Complies No earthworks requiring extensive cut and fill are required for any part of the infrastructure construction within the solar farm development site. All generation infrastructure (including road access from Silkwood Road) is located on slopes averaging <4%. No cut and fill will exceed 2m in height.
	AO1.2 Cuts are supported by batters, retaining or rock walls and associated benches/terraces are capable of supporting mature vegetation.	Not applicable No cuts requiring batters or retaining walls and / or benches/terraces capable of supporting mature vegetation are required for any aspect of construction within the development site.
	AO1.3 Cuts are screened from view by the siting of the building/structure, wherever possible.	Complies Cut and fill aspects are minor, and associated only with levelling of support pads for containerised infrastructure, and will be indiscernible post construction from any public viewpoint..
	AO1.4 Topsoil from the site is retained from cuttings and reused on benches/terraces.	Complies No benches/terraces proposed as part of the solar farm development footprint. No topsoil to be retained as a result.

Performance outcomes	Acceptable outcomes	Applicant response
	AO1.5 No crest of any cut or toe of any fill, or any part of any retaining wall or structure is closer than 600mm to any boundary of the property, unless the prior written approval of the adjoining landowner has been obtained.	Complies No cut and/or fill within 600mm of any property boundary is required for construction of any infrastructure within the solar farm generation site. All construction works are a minimum of 10m from lease boundary.
	AO1.6 Non-retained cut and/or fill on slopes are stabilised and protected against scour and erosion by suitable measures, such as grassing, landscaping or other protective/aesthetic measures.	Complies No cut and/or fill on slopes is required for construction of any infrastructure within the solar farm generation site.
Visual Impact and Site Stability		
PO2 Filling and excavation are carried out in such a manner that the visual/scenic amenity of the area and the privacy and stability of adjoining properties is not compromised.	AO2.1 The extent of filling and excavation does not exceed 40% of the site area, or 500m ² whichever is the lesser, except that AO2.1 does not apply to reconfiguration of 5 lots or more.	Complies Filling and excavation within the solar farm site will not exceed 500m ² . No major earthworks are required for the project. Only minor earthworks with minimal excavation and filling are required for the access road construction and drainage controls, solar array supports and installation of the containerised infrastructure on above ground footings.
	AO2.2 Filling and excavation does not occur within 2 metres of the site boundary.	Complies No filling and excavation will occur within 2 metres of the solar farm lease boundary.
Flooding and drainage		
PO3 Filling and excavation does not result in a change to the run off characteristics of a site which then have a detrimental impact on the site or nearby land or adjacent road reserves.	AO3.1 Filling and excavation does not result in the ponding of water on a site or adjacent land or road reserves.	Complies Only minor earthworks with minimal excavation and filling are required for the access road construction and drainage controls, solar array supports and installation of the containerised infrastructure on above ground footings. Drainage controls have been identified for the solar farm site, and a formal ESCP

Performance outcomes	Acceptable outcomes	Applicant response
		(construction) will be developed in according s.5 of the FNQROC Development Manual and the IECA Best Practice Erosion Control guidelines. Stormwater and erosion / sediment controls for the solar farm generation site are identified in drawing DRE-ELE-GAR-1004, DRE-ELE-GAR-1002, DRE-CIV-GAR-1021;
	AO3.2 Filling and excavation does not result in an increase in the flow of water across a site or any other land or road reserves.	Complies Drainage controls have been identified for the solar farm site, and a formal ESCP (construction) will be developed in according s.5 of the FNQROC Development Manual and the IECA Best Practice Erosion Control guidelines. Stormwater and erosion / sediment controls for the solar farm generation site are identified in drawing DRE-ELE-GAR-1004, DRE-ELE-GAR-1002, DRE-CIV-GAR-1021;
	AO3.3 Filling and excavation does not result in an increase in the volume of water or concentration of water in a watercourse and overland flow paths.	Complies Drainage controls have been identified for the solar farm site, and a formal ESCP (construction) will be developed in according s.5 of the FNQROC Development Manual and the IECA Best Practice Erosion Control guidelines. Stormwater and erosion / sediment controls for the solar farm generation site are identified in drawing DRE-ELE-GAR-1004, DRE-ELE-GAR-1002, DRE-CIV-GAR-1021;
	AO3.4 Filling and excavation complies with the specifications set out in Planning Scheme Policy No SC5 – FNQROC Development Manual.	Complies Filling and excavation required for the site is minor, and all works will comply with the FNQROC Development Manual specifications where these are appropriate to the scale and intensity of any excavation or fill required.
Water quality		

Performance outcomes	Acceptable outcomes	Applicant response
P04 Filling and excavation does not result in a reduction of the water quality of receiving waters.	A04 Water quality is maintained to comply with the specifications set out in Planning Scheme Policy No SC5 – FNQROC Development Manual.	Will comply Only minor earthworks with minimal excavation and filling are required for the access road construction and drainage controls, solar array supports and installation of the containerised infrastructure on above ground footings. Drainage controls have been identified for the solar farm site, and a formal ESCP (construction) will be developed in according s.5 of the FNQROC Development Manual and the IECA Best Practice Erosion Control guidelines. Stormwater and erosion / sediment controls for the solar farm generation site are identified in drawing DRE-ELE-GAR-1004, DRE-ELE-GAR-1002, DRE-CIV-GAR-1021;
Infrastructure		
P05 Excavation and filling does not impact on Public Utilities.	A05 Excavation and filling is clear of the zone of influence of public utilities.	Complies There are no public utilities within the solar farm development site. Excavation and filling within the solar farm is of a minor nature necessary only for access road construction and drainage controls.

9.4.5 Infrastructure works code

Table 9.4.5.3.a – Infrastructure works code –assessable development

Performance outcomes		Acceptable outcomes
For self-assessable and assessable development		
Compatible development		
PO1 Works on a local government road do not adversely impact on footpaths or existing infrastructure within the road verge and maintain the flow safety and efficiency of pedestrians, cyclists and vehicles,	AO1.1 Footpaths/pathways are located in the road verge and are provided for the hierarchy of the road and located and designed and constructed in accordance with Planning scheme policy SC5 – FNQROC Regional Development Manual.	Complies No footpaths or pathways are proposed for the project.
	AO1.2 Kerb ramp crossovers are constructed in accordance with Planning scheme policy SC 5 – FNQROC Regional Development Manual.	Complies No kerb ramp crossovers proposed.
	AO1.3 New pipes, cables, conduits or other similar infrastructure required to cross existing footpaths: (a) are installed via trenchless methods; or (b) footpath infrastructure is removed to install infrastructure, the new section of footpath is installed to the standard detailed in the Planning scheme policy SC5-FNQROC Regional Development Manual and is no less than a 1.2 metre section.	Complies There are no pipes, cables or conduits required to cross existing footpaths within or adjacent the solar farm generation site development footprint.
	AO1.4 Where existing footpaths are damaged as a result of development, footpaths are reinstated ensuring: (a) similar surface finishes are used; (b) there is no change in level at joins of new	Not applicable There are no existing footpaths within or adjacent the solar farm generation site development footprint.

Performance outcomes		Acceptable outcomes	
		<p>(c) and existing sections; new sections are matched to existing in terms of dimension and reinforcement.</p> <p>Note – Figure 9.4.5.3.a provides guidance on meeting the outcomes.</p>	
Accessibility structures			
<p>PO2</p> <p>Development is designed to ensure it is accessible for people of all abilities and accessibility features do not impact on the efficient and safe use of footpaths.</p> <p>Note – Accessibility features are those features required to ensure access to premises is provided for people of all abilities and include ramps and lifts.</p>	AO2.1	Accessibility structures are not located within the road reserve.	Not applicable No accessibility structures are proposed for the solar farm generation site.
	AO2.2	Accessibility structures are designed in accordance with AS1428.3	Not applicable No accessibility structures are proposed for the solar farm generation site.
	AO2.3	When retrofitting accessibility features in existing buildings, all structures and changes in grade are contained within the boundaries of the lot and not within the road reserve.	Not applicable No accessibility structures are proposed for the solar farm generation site.
Water supply			
<p>PO3</p> <p>An adequate, safe and reliable supply of potable, fire fighting and general use water is provided.</p>	AO3.1	The premises is connected to Council's reticulated water supply system in accordance with the Design Guidelines set out in Section D6 of the Planning scheme policy SC5 – FNQROC Regional Development Manual; or	Not applicable No water supply connection is proposed to Council's reticulation water supply network.
	AO3.2	Where a reticulated water supply system is not available to the premises, on site water storage tank/s with a minimum capacity of 10,000 litres of stored water, with a minimum 7,500 litre tank, with	Complies No water supply is proposed for the operational works within the road reserve.

Performance outcomes		Acceptable outcomes
		the balance from other sources (e.g. accessible swimming pool, dam etc.) and access to the tank/s for fire trucks is provided for each new house or other development. Tank/s are to be fitted with a 50mm ball valve with a camlock fitting and installed and connected prior to occupation of the house and sited to be visually unobtrusive.
Non tidal artificial waterways		
PO6 Development involving non-tidal artificial waterways is planned, designed, constructed and operated to: <ul style="list-style-type: none"> (a) protect water environmental values; (b) be compatible with the land use constraints for the site for protecting water environmental values; (c) be compatible with existing tidal and non-tidal waterways; (d) perform a function in addition to stormwater management; achieve water quality objectives.	AO6.1 Development involving non-tidal artificial waterways ensures: <ul style="list-style-type: none"> (a) environmental values in downstream waterways are protected; (b) any ground water recharge areas are not affected; (c) the location of the waterway incorporates low lying areas of the catchment connected to an existing waterway; (d) existing areas of ponded water are included 	Not applicable No non-tidal artificial waterways are proposed for this project.
	AO6.2 Non-tidal artificial waterways are located: <ul style="list-style-type: none"> (a) outside natural wetlands and any associated buffer areas; (b) to minimise disturbing soils or sediments; (c) to avoid altering the natural hydrologic regime in acid sulfate soil and nutrient hazardous areas. 	Not applicable No non-tidal artificial waterways are proposed for this project.
	AO6.3 Non-tidal artificial waterways located adjacent to, or connected to a tidal waterway by means of a weir, lock, pumping system or similar	Not applicable No non-tidal artificial waterways are proposed for this project.

Performance outcomes	Acceptable outcomes	
	<p>ensures:</p> <ul style="list-style-type: none"> (a) there is sufficient flushing or a tidal range of >0.3 m; or (b) any tidal flow alteration does not adversely impact on the tidal waterway; or (c) there is no introduction of salt water into freshwater environments. 	
	<p>AO6.4</p> <p>Non-tidal artificial waterways are designed and managed for any of the following end-use purposes:</p> <ul style="list-style-type: none"> (a) amenity (including aesthetics), landscaping or recreation; or (b) flood management, in accordance with a drainage catchment management plan; or (c) stormwater harvesting plan as part of an integrated water cycle management plan; or (d) aquatic habitat. 	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>
	<p>AO6.5</p> <p>The end-use purpose of the non-tidal artificial waterway is designed and operated in a way that protects water environmental values.</p>	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>
	<p>AO6.6</p> <p>Monitoring and maintenance programs adaptively manage water quality to achieve relevant water quality objectives downstream of the waterway.</p>	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>
	<p>AO6.7</p> <p>Aquatic weeds are managed to achieve a low percentage of coverage of the water surface area, and pests and vectors are managed through design</p>	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>

Performance outcomes	Acceptable outcomes	
	and maintenance.	
Wastewater discharge		
PO7 Discharge of wastewater to waterways, or off site: (a) meets best practice environmental management; (b) is treated to: (i) meet water quality objectives for its receiving waters; (ii) avoid adverse impact on ecosystem health or waterway health; (iii) maintain ecological processes, riparian vegetation and waterway integrity; (iv) offset impacts on high ecological value waters	A07.1 A wastewater management plan is prepared and addresses: (a) wastewater type; (b) climatic conditions; (c) water quality objectives; (d) best practice environmental management.	Not applicable No wastewater is generated by the electrical distribution network in the road reserve.
	A07.2 The waste water management plan is managed in accordance with a waste management hierarchy that: (a) avoids wastewater discharge to waterways; or (b) if wastewater discharge cannot practicably be avoided, minimises wastewater discharge to waterways by re-use, recycling, recovery and treatment for disposal to sewer, surface water and ground water.	Not applicable No wastewater is generated by the electrical distribution network in the road reserve.
	A07.3 Wastewater discharge is managed to avoid or minimise the release of nutrients of concern so as to minimise the occurrence, frequency and intensity of algal blooms.	Not applicable No wastewater is generated by the electrical distribution network in the road reserve.
	A07.4 Development in coastal catchments avoids or minimises and appropriately manages soil disturbance or altering natural hydrology and: (a) avoids lowering ground water levels	Not applicable No wastewater is generated by the electrical distribution network in the road reserve.

Performance outcomes	Acceptable outcomes	
	<p>where potential or actual acid sulfate soils are present;</p> <p>(b) manages wastewater so that:</p> <p>(i) the pH of any wastewater discharges is maintained between 6.5 and 8.5 to avoid mobilisation of acid, iron, aluminium and other metals;</p> <p>(ii) holding times of neutralised wastewater ensures the flocculation and removal of any dissolved iron prior to release;</p> <p>visible iron floc is not present in any discharge;</p> <p>(iv) precipitated iron floc is contained and disposed of;</p> <p>(iii) wastewater and precipitates that cannot be contained and treated for discharge on site are removed and disposed of through trade waste or another lawful method.</p>	
Electricity supply		
<p>PO8</p> <p>Development is provided with a source of power that will meet its energy needs.</p>	<p>AO8.1</p> <p>A connection is provided from the premises to the electricity distribution network;</p> <p>or</p>	<p>Complies</p> <p>All connections within the solar farm generation site and to the distribution network will be in accordance with the Qld <i>Electrical Safety Act 2002</i> and associated regulations. Refer drawing DRE-ELE-GAR-1010</p>
	<p>AO8.2</p> <p>The premises is connected to the electricity distribution network in accordance with the Design Guidelines set out in Section D8 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.</p>	<p>Complies</p> <p>The outgoing high voltage 22kV line from the solar farm generation site to the distribution network will be made in accordance with the FNQROC Regional Development Manual and in accordance with the Qld <i>Electrical Safety Act 2002</i> and associated regulations. Refer drawing DRE-ELE-GAR-1010</p>

Performance outcomes	Acceptable outcomes	
	Note - Areas north of the Daintree River have a different standard.	
PO9 Development incorporating pad-mount electricity infrastructure does not cause an adverse impact on amenity.	AO9.1 Pad-mount electricity infrastructure is: (a) not located in land for open space or sport and recreation purposes; (b) screened from view by landscaping or fencing; (c) accessible for maintenance.	Complies All pad mounted electricity infrastructure is located approximately 170m at their closest point from the nearest vantage point on Silkwood Road and is not located in land for open space or sport and recreation purposes. The tallest component is a telemetry/SCADA antennae of 7.5m tall which is less than the average tree height of 8 to 10m. Actual building (containerised generation equipment) are no taller than 4.61m Refer drawings DRE-GAR-1001 for general layouts and DRE-CIV-GAR-1012 for tallest structure. Additionally, the proponent has committed to additional vegetation planting within the existing vegetation along Silkwood Road to further improve visual screening from the road.
	AO9.2 Pad-mount electricity infrastructure within a building, in a Town Centre is designed and located to enable an active street frontage. Note – Pad-mounts in buildings in activity centres should not be located on the street frontage.	Not applicable The pad mounted infrastructure is not located within a building, or town centre.

Performance outcomes		Acceptable outcomes
Telecommunications		
PO10 Development is connected to a telecommunications service approved by the relevant telecommunication regulatory authority.	AO10 The development is connected to telecommunications infrastructure in accordance with the standards of the relevant regulatory authority.	Not applicable No telecommunications are required as part of the operational work in the road reserve.
PO11 Provision is made for future telecommunications services (e.g. fibre optic cable).	AO11 Conduits are provided in accordance with Planning scheme policy SC5 – FNQROC Regional Development Manual.	Not applicable No telecommunications are required as part of the operational work in the road reserve.
Road construction		
PO12 The road to the frontage of the premises is constructed to provide for the safe and efficient movement of: (a) pedestrians and cyclists to and from the site; (b) pedestrians and cyclists adjacent to the site; (c) vehicles on the road adjacent to the site; (d) vehicles to and from the site; (e) emergency vehicles.	AO12.1 The road to the frontage of the site is constructed in accordance with the Design Guidelines set out in Sections D1 and D3 of the Planning scheme policy SC5 – FNQROC Regional Development Manual, for the particular class of road, as identified in the road hierarchy.	Not applicable No new road works are applicable for the works proposed within the road reserve network. All construction, installation and maintenance will be accessed via the existing local govt road network.
	AO12.2 There is existing road, kerb and channel for the full road frontage of the site.	Not applicable No new road works are applicable for the works proposed within the road reserve network. All construction, installation and maintenance will be accessed via the existing local govt road network.
	AO12.3 Road access minimum clearances of 3.5 metres wide and 4.8 metres high are provided for the safe passage of emergency vehicles.	Not applicable No new road works are applicable for the works proposed within the road reserve network. All construction, installation and maintenance will be accessed via the existing local govt road network.

Performance outcomes		Acceptable outcomes
Alteration and repairs to public utility services		
PO13 Infrastructure is integrated with, and efficiently extends, existing networks..	AO13 Development is designed to allow for efficient connection to existing infrastructure networks.	Complies The design and location of the proposed works within the road reserve has been subject to discussions, field visits and recommendations with Douglas Shire Council road infrastructure staff and management. This has included consideration of existing underground Telstra cables, and Council assets in the road reserve including the roads themselves, footpaths, bridges, causeways, signage and other road reserve furniture. The proposed works and development are such that they will be integrated with DSC planning for proposed upgrades and maintenance of their assets.
	PO14 Development and works do not affect the efficient functioning of public utility mains, services or installations.	<div> AO14.1 Public utility mains, services and installations are not required to be altered or repaired as a result of the development. or AO14.2 Public utility mains, services and installations are altered or repaired in association with the works so that they continue to function and satisfy the relevant Design Guidelines set out in Section D8 of the Planning scheme policy SC5 – FNQROC Regional Development Manual. </div> <div> Alternative solution The response to the provisions of AO14.2 (below) apply to this project. The operational works have very specific functional location requirements that necessitate locating within the road reserve. There will be requirements for alterations and repairs to DSC road infrastructure as a necessary function of this project. See following. </div> <div> Complies Construction and operational / maintenance access to the solar farm generation site will require the construction of an access road from Silkwood Road. This access will necessarily cross the roadside drain on Silkwood Road to the site. This will require disturbance to DSC infrastructure, namely Silkwood Road and installation of a culvert in road side spoon drain. Refer drawing DRE-ELE-GAR-1004 for detail. All disturbance will be reinstated in accordance with direction and agreements with DSC, and with the relevant design guidelines in the Section D8 of the </div>

Performance outcomes		Acceptable outcomes
		Planning scheme policy SC5 – FNQROC Regional Development Manual.
Construction management		
PO15 Work is undertaken in a manner which minimises adverse impacts on vegetation that is to be retained.	AO15 Works include, at a minimum: (a) installation of protective fencing around retained vegetation during construction; (b) erection of advisory signage; (c) no disturbance, due to earthworks or storage of plant, materials and equipment, of ground level and soils below the canopy of any retained vegetation; (d) removal from the site of all declared noxious weeds.	Complies The entirety of the solar farm generation site has been designed to avoid the need for native vegetation clearing. Refer drawing DRE-ELE-GAR-1001 and DRE-ELE-GAR-1003, which shows the surveyed vegetation boundary relevant to the security fence which will surround the solar farm. All remnant vegetation is outside of this security fence, and will not be disturbed by any aspect of construction or operation. Security fencing will be ins A project EMP is appended as supporting information to this application. Key aspects to vegetation management are included in the EMP, including barrier fencing for sensitive vegetation, contractor induction and training, waste management, site overseeing of construction in sensitive locations by qualified ecologist/botanist, and biosecurity measures with respect to noxious species management.
PO16 Existing infrastructure is not damaged by construction activities.	AO16 Construction, alterations and any repairs to infrastructure is undertaken in accordance with the Planning scheme policy SC5 – FNQROC Regional Development Manual. Note - Construction, alterations and any repairs to State-controlled roads and rail corridors are undertaken in accordance with the Transport Infrastructure Act 1994.	Will comply All disturbance, construction and repairs to infrastructure will be reinstated in accordance with direction and agreements with DSC, and with the relevant design guidelines in the Section D8 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.

Performance outcomes		Acceptable outcomes
For assessable development		
High speed telecommunication infrastructure		
PO17 Development provides infrastructure to facilitate the roll out of high speed telecommunications infrastructure.	AO17 No acceptable outcomes are prescribed.	Not applicable No high speed telecommunications proposed as part of this project.
Trade waste		
PO18 Where relevant, the development is capable of providing for the storage, collection treatment and disposal of trade waste such that: (a) off-site releases of contaminants do not occur; (b) the health and safety of people and the environment are protected; (c) the performance of the wastewater system is not put at risk.	AO18 No acceptable outcomes are prescribed.	Complies No trade waste storage, collection and disposal is proposed for this project. There are no transformer oils or similar liquid / solid wastes associated with the operation of the distribution network.
Fire services in developments accessed by common private title		
PO19 Hydrants are located in positions that will enable fire services to access water safely, effectively and efficiently.	AO19.1 Residential streets and common access ways within a common private title places hydrants at intervals of no more than 120 metres and at each intersection. Hydrants may have a single outlet and be situated above or below ground.	Not applicable Solar farm generation site is not within a common private title development.
	AO19.2 Commercial and industrial streets and access ways within a common private title serving commercial properties such as factories and warehouses and offices are provided with above or below ground fire hydrants located at not more than 90 metre intervals and at each intersection.	Not applicable Solar farm generation site is not within a common private title development.

Performance outcomes	Acceptable outcomes	
	Above ground fire hydrants have dual-valved outlets.	
PO20 Hydrants are suitable identified so that fire services can locate them at all hours. Note – Hydrants are identified as specified in the Department of Transport and Main Roads Technical Note: 'Identification of street hydrants for fire fighting purposes' available under 'Publications'.	AO20 No acceptable outcomes are prescribed.	Not applicable Solar farm generation site is not within a common private title development.
PO8 The development design responds to the potential threat of bushfire and establishes clear evacuation routes which demonstrate an acceptable or tolerable risk to people.	AO8 The lot layout: (a) minimises the length of the development perimeter exposed to, or adjoining hazardous vegetation; (b) avoids the creation of potential bottle-neck points in the movement network; (c) establishes direct access to a safe assembly /evacuation area in the event of an approaching bushfire; and (d) ensures roads likely to be used in the event of a fire are designed to minimise traffic congestion. Note - For example, developments should avoid finger-like or hour-glass subdivision patterns or substantive vegetated corridors between lots. In order to demonstrate compliance with the performance outcome, a bushfire management plan prepared by a suitably qualified person may be required. The bushfire management plan should be developed in accordance with the Public Safety Business Agency (PSBA) guideline entitled "Undertaking a Bushfire Protection Plan. Advice from the Queensland Fire and Emergency Services (QFES) should be sought as appropriate	Not applicable Solar farm generation site is not within a common private title development.

9.4.6 Landscaping code

9.4.6.1 Application

- (1) This code applies to assessing:
- (a) operational work which requires a compliance assessment as a condition of a development permit; or
 - (b) A material change of use or reconfiguring a lot if:
 - i. Assessable development where this code is identified in the assessment criteria column of the table of assessment;
 - ii. Impact assessable development, to the extent relevant

Response:

Not applicable: The DMG project does not include any landscaping proposed as part of the solar farm generation site. Vegetation thickening of the existing native vegetation along Silkwood Road will be undertaken by a commercial revegetation contractor to improve visual buffering of the development from Silkwood Road.

9.4.7 Reconfiguring a lot code

Table 9.4.7.3.a – Reconfiguring a lot code – assessable development

Performance outcomes	Acceptable outcomes	Applicant response
General lot design standards		
PO1 Lots comply with the lot reconfiguration outcomes of the applicable Zone code in Part 5.	AO1 No acceptable outcomes are prescribed.	Complies The solar farm generation site lease complies with Performance outcomes PO13 relevant to reconfiguration of a lot within the Conservation zone as the reconfiguration satisfies part (a) of PO13 in Table 6.2.3.3a in that the lot reconfiguration results in no additional lots, e.g. through amalgamation or boundary lots.
PO2 New lots are generally rectangular in shape with functional areas for land uses intended by the zone.	AO2 Boundary angles are not less than 45 degrees.	Complies All boundary angles of the lease are greater than 45 degrees.




Performance outcomes	Acceptable outcomes	Applicant response
PO3 Lots have legal and practical access to a public road.	AO3 Each lot is provided with: (a) direct access to a gazetted road reserve; or (b) access to a gazetted road via a formal access arrangement registered on the title.	Complies The lease area (the new lot) has direct frontage and access to the Silkwood Road road reserve.
PO4 Development responds appropriately to its local context, natural systems and site features.	AO4 Existing site features such as: (a) significant vegetation and trees; (b) waterways and drainage paths; (c) vistas and vantage points are retained and/or (d) are incorporated into open space, road reserves, near to lot boundaries or as common property.	Complies The Daintree Microgrid solar farm generation site has been identified after a review of prudent and feasible assessment of: <ul style="list-style-type: none"> - other sites in the project area - ability to avoid native vegetation clearing - proximity to and away from waterways - viewsheds and visual impacts of the generation site, including PV arrays. The chosen site is in existing cleared areas, avoids native vegetation clearing, does not include any perennial or ephemeral waterway, is on mild slopes with minimal erosion risks, and is not visible from any residential or commercial premises. The site is only visible from traffic on the top section of Silkwood Road, and not from any other public vantage point.
PO5 New lots which have the capability of being further reconfigured into smaller lots at a later date are designed to not compromise ultimate development outcomes permitted in the relevant zone.	AO5 The ability to further reconfigure land at a later date is demonstrated by submitting a concept plan that meets the planning scheme requirements for the applicable Zone.	Not applicable There is no proposal to further reconfigure the existing lease.

Performance outcomes	Acceptable outcomes	Applicant response
<p>PO6</p> <p>Where existing buildings or structures are to be retained, development results in:</p> <ul style="list-style-type: none"> (a) boundaries that offer regular lot shapes and usable spaces; (b) existing improvements complying with current building and amenity standards in relation to boundary setbacks. <p>Note - This may require buildings or structures to be modified, relocated or demolished to meet setback standards, resolve encroachments and the like.</p>	<p>AO6</p> <p>Development ensures setbacks between existing buildings or structures and proposed boundaries satisfy relevant building standards or zone code requirements, whichever is the greater.</p>	<p>Not applicable</p> <p>There are no existing buildings or structures on site to be retained.</p>
<p>PO7</p> <p>Where rear lots are proposed, development:</p> <ul style="list-style-type: none"> (a) provides a high standard of amenity for residents and other users of the site and adjoining properties; (b) positively contributes to the character of adjoining properties and the area; (c) does not adversely affect the safety and efficiency of the road from which access is gained. 	<p>AO7.1</p> <p>Where rear lots are to be established:</p> <ul style="list-style-type: none"> (a) the rear lot is generally rectangular in shape, avoiding contrived sharp boundary angles; (b) no more than 6 lots directly adjoin the rear lot; (c) no more than one rear lot occurs behind the road frontage lot; (d) no more than two access strips to rear lots directly adjoin each other; (e) access strips are located only on one side of the road frontage lot. 	<p>Not applicable</p> <p>There are no rear lots proposed as part of the solar farm development.</p>
	<p>AO7.2</p> <p>Access strips to the rear lot have a minimum width dimension of:</p> <ul style="list-style-type: none"> (a) 4.0 metres in Residential Zones. (b) 8.0 metres in Industrial Zones category. (c) 5.0 metres in all other Zones. <p>Note - Rear lots are generally not appropriate in non-Residential or non-Rural zones.</p>	<p>Not applicable</p> <p>There are no rear lots proposed as part of the solar farm development.</p>

Performance outcomes	Acceptable outcomes	Applicant response
	A07.3 Access strips are provided with a sealed pavement of sufficient width to cater for the intended traffic, but no less than: (a) 3.0 metres in Residential Zone. (b) 6.0 metres in an Industrial Zone. (c) 3.5 metres in any other Zone.	Not applicable There are no rear lots proposed as part of the solar farm development.
Structure plans		
Additional requirements for: (a) a site which is more than 5,000m ² in any of the Residential zones; or within these zones, and (b) creates 10 or more lots; or (c) involves the creation of new roads and/or public use land. or (d) For a material change of use involving: (i) preliminary approval to vary the effect of the planning scheme; (ii) establishing alternative Zones to the planning scheme. Note - This part is to be read in conjunction with the other parts of the code		
PO8 A structure plan is prepared to ensure that neighbourhood design, block and lot layout, street network and the location and provision on any open space recognises previous planning for the area and its surroundings, and integrates appropriately into its surroundings.	A08.1 Neighbourhood design, lot and street layout, and open space provides for, and integrates with, any: (a) approved structure plan; (b) the surrounding pattern of existing or approved subdivision. Note - Planning scheme policy SC14– Structure planning provides guidance on meeting the performance outcomes.	Not applicable The solar farm generation site is not within a Residential zone, does not create 10 or more lots, nor establishes an alternative Zone to the planning scheme.
	A08.2 Neighbourhood design, lot and street layouts enable future connection and integration with adjoining undeveloped land.	Not applicable The solar farm generation site is not within a Residential zone, does not create 10 or more lots, nor establishes an alternative Zone to the planning scheme

Performance outcomes	Acceptable outcomes	Applicant response
<p>PO9 Neighbourhood design results in a connected network of walkable streets providing an easy choice of routes within and surrounding the neighbourhood.</p>	<p>AO9.1 Development does not establish cul-de-sac streets unless:</p> <ul style="list-style-type: none"> (a) cul-de-sacs are a feature of the existing pattern of development in the area; (b) there is a physical feature or incompatible zone change that dictates the need to use a cul-de-sac streets. <p>AO9.2 Where a cul-de-sac street is used, it:</p> <ul style="list-style-type: none"> (a) is designed to be no longer than 150 metres in length; (b) is designed so that the end of the cul-de-sac is visible from its entrance; (c) provides connections from the top of the cul-de-sac to other streets for pedestrians and cyclists, where appropriate. <p>AO9.3 No more than 6 lots have access to the turning circle or turning-tee at the end of a cul-de-sac street.</p>	<p>Not applicable The solar farm generation site is not within a Residential zone, does not create 10 or more lots, nor establishes an alternative Zone to the planning scheme.</p>
<p>PO10 Neighbourhood design supports diverse housing choices through block sizes and lot design. In developing areas, significant changes in lot size and frontage occur at the rear of lots rather than on opposite sides of a street.</p>	<p>PO10 No acceptable outcomes are prescribed.</p>	<p>Not applicable The solar farm generation site is not within a Residential zone, does not create 10 or more lots, nor establishes an alternative Zone to the planning scheme.</p>
<p>PO11 Provision of physical and social infrastructure in developing residential neighbourhoods is facilitated through the orderly and sequential development of land.</p>	<p>AO11.1 New development adjoins adjacent existing or approved urban development.</p>	<p>Not applicable The solar farm generation site is not within a Residential zone, does not create 10 or more lots, nor establishes an alternative Zone to the planning scheme.</p>

Performance outcomes	Acceptable outcomes	Applicant response
Note - Part 4 – Local government infrastructure plan may identify specific levels of infrastructure to be provided within development sites.	AO11.2 New development is not established beyond the identified Local government infrastructure plan area	Not applicable The solar farm generation site is not within a residential neighbourhood.
Urban parkland and environmental open space		
PO12 Where appropriate development maintains and enhances public access and use of natural areas, rivers, dams, creeks and the foreshore.	AO12 No acceptable outcomes are prescribed.	Not applicable No urban parkland and environmental open spaces are proposed for the solar farm generation site.
PO13 Development provides land to: (a) meet the recreation needs of the community; (b) provide an amenity commensurate with the structure of neighbourhoods and land uses in the vicinity; and adjacent to open space areas; (c) provide for green corridors and linkages.	AO13 No acceptable outcomes are prescribed. Note - Part 4 – Priority infrastructure plan and Planning scheme policy SC14 – Structure Plans provides guidance in providing open space and recreation land.	Not applicable No urban parkland and environmental open spaces are proposed for the solar farm generation site.
AO14 Lot size, dimensions, frontage and orientation permits buildings to be established that will facilitate casual surveillance to urban parkland and environmental open space.	AO14.1 Urban parkland is regular in shape.	Not applicable No urban parkland and environmental open spaces are proposed for the solar farm generation site.
	AO14.2 At least 75% of the urban parkland's frontage is provided as road.	Not applicable No urban parkland and environmental open spaces are proposed for the solar farm generation site.
	AO14.3 Urban parkland and environmental open space areas are positioned to be capable of being overlooked by surrounding development.	Not applicable No urban parkland and environmental open spaces are proposed for the solar farm generation site.
	AO14.4 Surrounding lots are orientated so that facades will front and overlook the urban parkland and environmental open space.	Not applicable No urban parkland and environmental open spaces are proposed for the solar farm generation site.

Performance outcomes	Acceptable outcomes	Applicant response
	<p>AO14.5 The number of lots that back onto, or are side-orientated to the urban parkland and environmental open space is minimised.</p>  <p>Inconsistent design solution - low total number of lots complying with the acceptable outcomes</p>  <p> Lots orientated to front and overlook park to provide casual surveillance.</p> <p>Consistent design solution - high total number of lots complying with the acceptable outcomes.</p>	<p>Not applicable No urban parkland and environmental open spaces are proposed for the solar farm generation site.</p>

Performance outcomes	Acceptable outcomes	Applicant response
Private subdivisions (gated communities)		
PO15 Private subdivisions (gated communities) do not compromise the establishment of connected and integrated infrastructure and open space networks.	PO15 No acceptable outcomes are prescribed.	Not applicable The solar farm generation site is not a gated community private subdivision.
Additional requirements for reconfiguration involving the creation of public streets or roads		
PO16 The function of new roads is clearly identified and legible and provides integration, safety and convenience for all users.	AO16 No acceptable outcomes are prescribed. Note - The design and construction standards are set out in Planning scheme policy SC5 – FNQROC Regional Development Manual, with reference to the specifications set out in Sections D1 and D3.	Not applicable The solar farm generation site development does not include the creation of public streets or roads.
PO17 Street design supports an urban form that creates walkable neighbourhoods. Street design: (a) is appropriate to the function(s) of the street; (b) meets the needs of users and gives priority to the needs of vulnerable users.	AO17 No acceptable outcomes are prescribed.	Not applicable The solar farm generation site development does not include the creation of public streets or roads.
Public transport network		
PO18 Development provides a street pattern that caters for the extension of public transport routes and infrastructure including safe pedestrian pick-up and set-down up facilities.	AO18 No acceptable outcomes are prescribed.	Not applicable The solar farm generation site does not provide for an extension of the public transport route and infrastructure.
Pest plants		

Performance outcomes	Acceptable outcomes	Applicant response
<p>PO19 Development activities and sites provide for the removal of all pest plants and implement ongoing measures to ensure that pest plants do not reinfest the site or nearby sites.</p> <p>Editor's note - This does not remove or replace all land owner's obligations or responsibilities under the Land Protection (Pest and Stock Route Management) Act 2002.</p>	<p>AO19 Pest plants detected on a development site are removed in accordance with a management plan prepared by an appropriately qualified person prior to earthworks commencing.</p> <p>Note - A declaration from an appropriately qualified person validates the land being free from pest plants. Declared pest plants include locally declared and State declared pest plants.</p>	<p>Will comply Previous surveys by a qualified ecologist have identified no pest plants at the site. A further survey will be undertaken prior to construction.</p>

9.4.8 Ship-sourced pollutants reception facilities in marinas code

9.4.8.1 Application

- (1) This code applies to all private marine development with six or more berths, located outside Strategic Port Land, Core Port Land and State Development Areas.

Response:

Not applicable: The DMG project is not a private marine development with six or more berths.

9.4.9 Vegetation management code

Table 9.4.9.3.a – Vegetation management –assessable development

Note – All vegetation damage is to have regard to the provisions of AS4373-2009 Pruning of Amenity Trees

Performance outcomes	Acceptable outcomes	Applicant response
For self-assessable and assessable development		
PO1 Vegetation is protected to ensure that: (a) the character and amenity of the local area is maintained; (b) vegetation damage does not result in fragmentation of habitats; (c) vegetation damage is undertaken in a sustainable manner; (d) the Shire's biodiversity and ecological values are maintained and protected; (e) vegetation of historical, cultural and / or visual significance is retained; (f) vegetation is retained for erosion prevention and slope stabilisation.	AO1.1 Vegetation damage is undertaken by a statutory authority on land other than freehold land that the statutory authority has control over; or	Not applicable No vegetation damage to be undertaken by a statutory authority within the solar farm generation site.
	AO1.2 Vegetation damage is undertaken by or on behalf of the local government on land controlled, owned or operated by the local government; or	Not applicable No vegetation damage to be undertaken by a the proponent on behalf of Douglas Shire Council
	AO1.3 Vegetation damage, other than referenced in AO1.1 or AO1.2 is the damage of: (a) vegetation declared as a pest pursuant to the <i>Land Protection (Pest and Stock Route Management) Act 2002</i> ; or (b) vegetation identified within the local government's register of declared plants pursuant to the local government's local laws; or (c) vegetation is located within a Rural zone and the trunk is located within ten metres of an existing building; or (d) vegetation is located within the Conservation zone or Environmental management zone and the trunk is located within three metres of an existing or approved structure, not including a boundary fence;.	Complies The solar farm generation site is cleared, with only isolated cattle camp shade trees present, none of which are identified as significant trees, and are to be removed for the safe construction and operation of the PV solar arrays. Surveys as of June 2023 did not identify any pest species pursuant to the DSC Biosecurity Management Plan 2022-2026. Further surveys will be undertaken prior to construction.

Performance outcomes	Acceptable outcomes	Applicant response
	AO1.4 Vegetation damage that is reasonably necessary for carrying out work that is: (a) authorised or required under legislation or a local law; (b) specified in a notice served by the local government or another regulatory authority; or	Complies (a) Requirements under the <i>Electricity Safety Act 2002</i> and Construction and operation of solar farms Code of Practice 2019 stipulate setbacks from vegetation that could impact on electrical infrastructure. In this instance it will apply to the removal of cattle camp shade trees that are located within the solar PV arrays and the security fence about the perimeter of the development area. (b) Not applicable – no notice served by DSC or another regulatory authority.
	AO1.5 Vegetation damage for development where the damage is on land the subject of a valid development approval and is necessary to give effect to the development approval; or	Will comply The removal of the cattle camp shade trees is essential to the safe construction and operation of the solar farm generation site.
	AO1.6 Vegetation damage is in accordance with an approved Property Map of Assessable Vegetation issued under the <i>Vegetation Management Act 1999</i> ; or	Not applicable No PMAV is required under the <i>Vegetation Management Act 1999</i> for the solar farm generation site. No mapped regulated vegetation is located within the development footprint.
	AO1.7 Vegetation damage is essential to the maintenance of an existing fire break; or	Not applicable No firebreak is required for the solar farm generation site. A buffer of 20m comprising the existing pasture grass area is to be maintained between the nearest native vegetation and the solar farm infrastructure.
	AO1.8 Vegetation damage is essential to prevent interference to overhead service cabling; or	Not applicable No overhead service cabling within the solar farm generation site. No vegetation damage required.
	AO1.9 Vegetation damage is for an approved Forest practice, where the lot is subject to a scheme	Not applicable The solar farm generation site will not be operating an approved Forest practice.

Performance outcomes	Acceptable outcomes	Applicant response
	approved under the <i>Vegetation Management Act 1999</i> ; or	
	AO1.10 Vegetation damage is undertaken in accordance with section 584 of the <i>Sustainable Planning Act 2009</i> .	Not applicable <i>Sustainable Planning Act 2009</i> repealed 3 rd July 2017
	AO1.11 Vegetation damage where it is necessary to remove one tree in order to protect an adjacent more significant tree (where they are growing close to one another).	Not applicable The solar farm generation site is cleared, with only isolated cattle camp shade trees present, none of which are identified as significant trees, and are to be removed for the safe construction and operation of the PV solar arrays.
	AO1.12 Private property owners may only remove dead, dying, structurally unsound vegetation following receipt of written advice from, at minimum, a fully qualified Certificate V Arborist. A copy of the written advice is to be submitted to Council for its records, a minimum of seven business days prior to the vegetation damage work commencing.	Will comply Dead, dying or structurally unsound vegetation will only be removed where there is a risk that they may fall upon the security fence surrounding the solar farm generation site. Otherwise all vegetation is set back an existing cleared buffer area a minimum of 20m from the solar farm infrastructure.
PO2 Vegetation damaged on a lot does not result in a nuisance	AO2.1 Damaged vegetation is removed and disposed of at an approved site; or	Complies Vegetation associated with removal of cattle camp shade trees within solar farm PV array areas are to be removed and mulched/chipped on site.
	AO2.2 Damaged vegetation is mulched or chipped if used onsite.	Complies Existing cattle camp shade trees within solar farm PV array areas are to be removed and mulched/chipped on site for use in stabilisation works.
For assessable development		
PO3 Vegetation damage identified on the Places of significance overlay lot does not result in a negative impact on the site's heritage values.	AO3 No acceptable outcomes are prescribed.	Complies The solar farm generation site is not within or adjacent to a Place of significance as identified on the Places of significance overlay maps

Part B

**Tables of Assessment,
Operational Works in a Local Government Road – internal road reserve DMG project lease plan area**

6.2.3 Conservation zone code

Table 6.2.3.3.a - Conservation zone – assessable development

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
PO1 The establishment of uses is consistent with the outcomes sought for the Conservation zone and protects the zone from the intrusion of inconsistent uses.	AO1 Uses identified in Table 6.2.3.3.b are not established in the Conservation zone.	Complies Operational works within the internal road reserve includes underground cabling, drainage, and road access construction. None of these activities are listed under Table 6.2.3.3b as an inconsistent use.
PO2 The height of buildings is compatible with the character of the area and does not adversely affect the amenity of the area.	AO2 Buildings and structures are not more than 8.5 metres in height and two storeys. Note - Height is inclusive of roof height.	Complies: No buildings or structures are proposed to be constructed within the internal road reserve
PO3 Development is setback from site boundaries so they are screened from view from the boundaries of adjoining properties and adjoining roads to maintain the scenic values of the area.	AO3 Buildings and structures are setback not less than: (a) 40 metres from the frontage of a State controlled road, existing or proposed arterial road, existing or proposed sub-arterial road, as identified on the Transport network overlay maps contained in Schedule 2; (b) 25 metres from Cape Tribulation Road frontage; (c) 20 metres from any other road frontage (d) 10 metres from side and rear boundaries.	Complies No buildings or structures are proposed to be constructed within the internal road reserve. Development is restricted to underground cabling, drainage, and road access construction.
PO4 The site coverage of all buildings and structures does not have an adverse effect on the conservation or scenic amenity values of the site and surrounding area and buildings are subservient to the natural environment.	AO4 Development is sited in an existing cleared area or an area approved for clearing, but which is not yet cleared until a development permit to carry out Building Works is issued. Any clearing is limited to a maximum area of 700m ² and is sited clear of the	Complies: The existing road reserve through the lease plan area is cleared, and works within the road reserve will have no adverse effect on conservation or scenic amenity.

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
	<p>high bank of any watercourse.</p> <p>Note – The 700m² area of clearing does not include an access driveway.</p>	
<p>PO5</p> <p>Development is consistent with the overall outcomes sought for the Conservation zone.</p>	<p>AO5</p> <p>No acceptable outcomes are prescribed.</p>	<p>Complies</p> <p>The operational works component within the existing road reserve in the lease plan area is consistent with the overall outcomes of the Conservation Zone in that:</p> <p>a) The works in the road reserve is an essential component in delivering a sustainable, renewable power supply from the proposed Daintree Microgrid Project. – thereby reducing reliance on hydrocarbon fuels and reducing the carbon emission footprint from the Daintree region.</p> <p>b) No vegetation / habitats are required to be cleared/disturbed for works within the road reserve.</p>
<p>PO6</p> <p>Development complements, and is subservient to the surrounding environment and is in keeping with the ecological, landscape and scenic values of the area.</p>	<p>AO6</p> <p>The exterior finishes and colours of all development are non-reflective and consist of colours that blend easily with surrounding native vegetation and view-shed.</p>	<p>Complies</p> <p>The existing road reserve in the internal lease area will be used only for site access, drainage, and laying of underground cabling connecting the PV arrays to the generation infrastructure.</p>
<p>PO7</p> <p>Development is screened from view from adjoining roads and properties with a dense screen of endemic/native landscape which:</p> <p>(a) is informal in character and complementary to the existing natural environment;</p> <p>(b) provides screening;</p>	<p>AO7.1</p> <p>For any development, the balance area of the site not built upon, including all setback areas must be landscaped/revegetated with dense three tier, endemic planting which is maintained to ensure successful screening is achieved.</p>	<p>Complies</p> <p>The internal access road and solar farm generation site generally, is partially screened from public view on Silkwood Road by existing road side vegetation. The proponent has undertaken to further improve the screening effect by contracting a commercial revegetation company to increase the thickness of the existing vegetation.</p>

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
<p>(c) enhances the visual appearance of the development.</p> <p>Note – Planning scheme policy – Landscaping provides further guidance on meeting the performance outcome.</p>	<p>AO7.2</p> <p>Endemic palm species, where used, are planted as informal accent features and not as avenues and not in a regular pattern.</p>	<p>Not applicable</p> <p>No palm species are proposed to be planted.</p>
<p>P08</p> <p>Development is complementary to the surrounding environment.</p>	<p>AO8.1</p> <p>Development harmonises with the surrounding environment, for example, through suspended, light-weight construction on sloping sites, which requires minimal excavation or fill.</p>	<p>Complies</p> <p>The existing road reserve in the internal lease area will be used only for site access, drainage, and laying of underground cabling connecting the PV arrays to the generation infrastructure.</p> <p>The existing road reserve is cleared, and no development is proposed other than creating a site access, drainage controls, and underground cable laying.</p>
	<p>AO8.2</p> <p>A driveway or parking areas are constructed and maintained to:</p> <ul style="list-style-type: none"> (a) minimise erosion, particularly in the wet season; (b) minimise cut and fill; (c) follow the natural contours of the site; (d) minimise vegetation clearing 	<p>Not applicable</p> <p>No driveways or parking areas are proposed to be constructed.</p>
	<p>AO8.3</p> <p>Buildings and structures are erected on land not exceeding a maximum gradient of 1 in 6 (16.6%).</p> <p>or</p> <p>On land steeper than 1 in 6 (16.6%) gradient:</p> <ul style="list-style-type: none"> (a) A split level building form is utilised; (b) A single plane concrete slab is not utilised; (c) Any voids between building and ground level, or between outdoor decks and ground level are screened from view using lattice/battens and/or landscaping. <p>and</p> <ul style="list-style-type: none"> (d) is accompanied by a Geotechnical Report prepared by a qualified engineer at 	<p>Complies</p> <p>The existing road reserve in the internal lease area will be used only for site access, drainage, and laying of underground cabling connecting the PV arrays to the generation infrastructure.</p> <p>No part of the works will be on land steeper than 1 in 6 (16.6%) gradient:</p> <p>A geotechnical survey and report has been prepared for the solar farm and is included as Appendix H.</p>

Performance outcomes	Acceptable outcomes	Applicant response
For assessable development		
	development application stage which includes certification that the site can be stabilised followed by a certificate upon completion of works.	
	AO8.4 Buildings and structures are sited below any ridgelines and are sited to avoid protrusion above the surrounding tree-level canopy.	Complies The existing road reserve in the internal lease area will be used only for site access, drainage, and laying of underground cabling connecting the PV arrays to the generation infrastructure. No buildings or structures are proposed within the road reserve.

7.2.1 Cape Tribulation and Daintree Coast local plan code

Table 7.2.1.10.a – Cape Tribulation and Daintree Coast local plan – assessable development

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
PO1 Development does not result in a demand which exceeds the capacity of: <ul style="list-style-type: none"> (a) the Daintree River ferry crossing; (b) Alexandra Range Road; (c) the local road network. 	AO1 No acceptable outcomes are prescribed.	Complies The works within the internal road reserve are entirely for the purpose of laying underground cables, site access and drainage. These works will not result in any additional traffic demand on the public road network.
PO2 Development provides a suitable standard of self- sufficient service for: <ul style="list-style-type: none"> (a) potable water; (b) water for fire fighting purposes; (c) electricity supply. 	AO2.1 Water storage is provided in tank/s with a minimum capacity to service the proposed use, including fire fighting capacity, and access to the tank/s for fire trucks. Tank/s are to be: <ul style="list-style-type: none"> (a) fitted with a 50mm ball valve and camlock fitting; (b) installed and connected prior to occupation; (c) sited so as to be visually unobtrusive. 	Not applicable No water storage is proposed for works within the road reserve network.
	AO2.2 Water storage tanks are to be fitted with screening at their inlets to prevent the intrusion of leaves and insects.	Not applicable No water storage is proposed for works within the road reserve network.
	AO2.3 An environmentally acceptable and energy	Complies Operational works within the road reserve are essential to the

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	efficient power supply is constructed, installed and connected prior to occupation and sited so as to be screened from the road.	implementation of the Daintree Microgrid Project, a 8MW hybrid solar/hydrogen generation plant located in Cow Bay.
PO3 On-site waste water does not adversely impact on the environmental quality of the water and soil resources or amenity of residents, through the implementation of best environmental practice.	AO3 No acceptable outcomes are prescribed.	Complies There are no waste water producing development proposed for the works within the internal road reserve.
PO4 The sustainability of the natural water resources of the area is protected for ecological and domestic consumption purposes.	AO4.1 If groundwater is to be used, development is limited to one bore per site and the bore is: (a) not located within 100 metres of a septic disposal (b) trench (on the site or adjoining sites); (c) not located within 100 metres of another bore.	Complies No groundwater abstraction is required or proposed for this project.
	AO4.2 Surface water is to be used for domestic purposes only.	Complies No surface water abstraction is required or proposed for this project.
PO5 Development does not adversely impact on areas of sensitive natural vegetation, foreshore areas, watercourses and/or areas of tidal inundation.	AO5 No acceptable outcomes are prescribed.	Complies The internal road reserve is cleared, and is located on existing grazing pasture. No clearing of any vegetation or disturbance to watercourses will be undertaken/required.
PO6 Development is subservient to the surrounding natural environment in scale and intensity and	AO6.1 The exterior finishes and colours of buildings are non-reflective and complement the colours of the surrounding vegetation and view shed.	Complies No buildings will be located within the internal road reserve of the lease plan area.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
is designed to be functional in a humid tropical rainforest environment.	AO6.2 The noise of generators is controlled by design, or the generator is enclosed within a sound insulated building with a residential approved muffler. The noise level generated is less than 65 dBA when measured from a distance of 7 metres.	Complies No generators are proposed to be located within the road reserve as a component of this project.
	AO6.3 Any fuel storage associated with an on-site generator, with storage of 20 litres or more of fuel, is enclosed with a building and provided with a bund.	Not applicable No generators are proposed to be located within the road reserve and thus no fuel storages are required.
PO7 Landscaping of the development ensures that the endemic character of the local area is dominant.	AO7.1 Landscaping complies with the requirements of Planning Scheme Policy 7 – Landscaping;	No applicable No landscaping is required for the works within the road reserve.
	AO7.2 All of the existing landscaping to be retained and all of the proposed landscaping is 100% endemic or native species and the details are provided on a landscape plan.	Not applicable No landscaping is required for the works within the road reserve
PO8 Site access driveways and roads within the local plan area are retained as safe, slow speed, scenic drives.	AO8.1 Site access driveways and existing or proposed roads comply with the relevant requirements of Planning Scheme Policy 5 – FNQROC. Development Manual and are maintained as low speed gravel roads to maintain the scenic drive experience and to discourage the use of roads by through-traffic;	Complies Access driveway off Silkwood Road complies with relevant requirements of Planning Scheme Policy 5 – FNQROC. Development Manual. Refer drawing DRE-ELE-GAR-1004 for detail.
	AO8.2	Not applicable No upgrading of any 4-wheel drive road/track to facilitate

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	Where existing roads/tracks are 4-wheel drive only, upgrading to facilitate conventional vehicles and an increase in through traffic does not occur.	conventional vehicles will be undertaken for this project.
PO9 The on-site impacts on natural flow regimes and erosion and sedimentation are minimised.	AO9.1 Filling and excavation is kept to a minimum and involves not more than 5% of the cleared area of the lot.	Complies Minimal filling and excavation are required for the drainage, underground cabling, and road access works proposed. Filling and excavation will be less than 5% of the cleared area of the solar site generally. Refer drawings DRE-CIV-GAR-1021 and DRE-ELE-GAR-1002, DRE-ELE-GAR-1003, DRE-ELE-GAR-1004
	AO9.2 All exposed surfaces must incorporate erosion and sediment controls during construction and must be maintained until revegetation, or other permanent stabilisation, has occurred.	Complies Drainage proposed and erosion and sediment control measures are identified in drawings DRE-CIV-GAR-1021 and DRE-ELE-GAR-1002, DRE-ELE-GAR-1003, DRE-ELE-GAR-1004. Refer also to the attached project EMP (Appendix G) for further measures.
	AO9.3 This is no disturbance to tree roots and trenching does not involve any damage to tree roots.	Complies No vegetation is required to be cleared within the internal road reserve which is primarily under pasture as part of a grazing holding.
	AO9.4 On-site drainage and stormwater management: <ul style="list-style-type: none"> (a) maintains natural flow regimes; (b) minimises impervious surfaces; (c) avoids concentration of flows, but where there is any form of concentration of flow, energy dissipation measures are installed at the outlet to avoid erosion (e.g. rock rip rap, gravel beds, diffusers etc.) 	Complies Natural topographic profile of the site will not be altered and proposed drainage works will utilise existing natural flow paths. Access road will be gravel and maintain permeability. The small size of individual solar panels and clearance above the ground will ensure that runoff from individual panels does not concentrate flows and retains local ground permeability during rainfall events. Rainwater from impervious rooftop catchments will be directed to the onsite filtration and storage tank. Refer

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
		DRE-ELE-GAR-1002, DRE-ELE-GAR-1004, DRE-CIV-GAR-1021
General requirements – Dwelling house		
PO10 Development minimises the loss of vegetation and habitat connectivity on site and is sited to protect the environmental values of the site.	AO10.1 The elements of development and access to the site are included in a Designated Development Area (DDA).	Not applicable No dwelling proposed
	AO10.2 Development is sited in an existing cleared area or in an area approved for vegetation clearing.	Not applicable No dwelling proposed
	AO10.3 Any new clearing is limited to a maximum area of 700m ² and is sited to be clear of the high bank of any watercourse. Note – The 700m ² of clearing does not include an access driveway.	Not applicable No dwelling proposed
PO11 All existing native vegetation on a house site, other than that required and approved to be cleared for the construction of a house and access thereto, is protected to ensure the environmental integrity of the local plan area.	AO11 No acceptable solutions are prescribed.	Not applicable No dwelling proposed
PO12 Wildlife movement, fauna habitat and habitat corridors are protected and domestic impacts are minimised.	AO12.1 Fences are limited in extent to the confines of the cleared area around the house and any associated gates are self-closing.	Not applicable No dwelling proposed
	AO12.2	Not applicable

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	External lighting is to be kept to the minimum necessary for orientation, safety and security. Flood lights must not point up, and areas of retained vegetation should, in general, not be illuminated. Where appropriate, outdoor lights are controlled by movement detectors and/or timers.	No dwelling proposed
PO13 House sites have efficient and safe vehicle access and manoeuvring areas on site, and to the site, to an acceptable standard for the local plan area.	AO13.1 Vehicle access is limited to one access per lot and sited in an approved location, clear of any watercourses.	Not applicable No dwelling proposed
	AO13.2 Vehicular access is a maximum width of 4 metres, avoids large tree specimens and/or significant vegetation and habitat corridors and is constructed and maintained to a minimum gravel standard of 75mm of road base on a compacted soil surface.	Not applicable No dwelling proposed
	AO13.3 Vehicular access is constructed prior to house construction.	Not applicable No dwelling proposed
Additional requirements for Nature based tourism, being Forest stay accommodation		
PO14 Forest stay accommodation provides a local economic opportunity for permanent residents of those parts of the Shire which are isolated and constrained by a lack of urban services and facilities.	AO14 Forest stay accommodation: (a) is confined to: (i) Precinct 2 – Low impact residential precinct; (ii) Precinct 5 – Low impact rural and tourism enterprise precinct; (iii) Precinct 6 – Low impact tourism accommodation precinct. (b) does not occur above the 60 metre contour;	Not applicable No Forest stay accommodation proposed.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	(c) is located on lots of 10 hectares or greater.	
PO15 Forest stay accommodation remains ancillary to the primary residential use and the natural values of the land and the use is compatible with the character and amenity of the locality.	AO15.1 The maximum number of guests is 10 (10 bed spaces) with up to a maximum of 4 staff (4 bed spaces); Note – Staff includes permanent residents of the dwelling house involved in catering for the use.	Not applicable No Forest stay accommodation proposed.
	AO15.2 None of the accommodation, whether for guests or staff, is self-contained as the use operates only in association with an existing dwelling on the site.	Not applicable No Forest stay accommodation proposed.
	AO15.3 Forest stay accommodation is located on a site which has an existing cleared area.	Not applicable No Forest stay accommodation proposed.
	AO15.4 The natural values of the balance area of the site are protected and enhanced with organised tours being conducted for visiting guests.	Not applicable No Forest stay accommodation proposed.
	AO15.5 If forest stay accommodation is provided in buildings which are separate from the dwelling: (a) the maximum number of separate building/s is determined based on each building containing a minimum of 2 bed spaces each, provided that each building has a maximum area of 50m ² (inclusive of verandahs/patios etc.); or (b) a maximum of one communal bunkhouse is	Not applicable No Forest stay accommodation proposed.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	(c) provided with a maximum area of 150m ² to accommodate 10 guests (10 bed spaces) (d) (inclusive of verandahs/patios etc.); or (e) a maximum of two communal bunkhouses are provided with a maximum area of 150m ² each to accommodate a maximum of 20 guests (20 bed spaces) (inclusive of verandahs/patios etc).	
	AO15.6 No kitchen or cooking facilities, with the exception of those located within the existing dwelling on the site are provided in association with the forest stay accommodation.	Not applicable No Forest stay accommodation proposed.
PO16 Development ensures guests are accommodated for short-stay and the dwelling is not the usual residence of the guest.	AO16 Development involves guests staying a maximum of 14 consecutive nights.	Not applicable No Forest stay accommodation proposed.
PO17 Development ensures that effluent disposal and treatment minimise odour and impacts on the natural environment.	AO17 Development provides an on-site effluent treatment system that is adequately sized to effectively treat effluent from the dwelling house and any additional persons occupying the premises as guests.	Not applicable No Forest stay accommodation proposed.
Additional requirements for Precinct 1 – Conservation precinct		
PO18 The biodiversity value of the area and the habitat of endemic species is protected on land included in the Rainforest Conservation precinct.	AO18 No new development occurs whether on undeveloped or developed land except for: Undeveloped land that meets one or more of the following criteria:	Not applicable No part of the internal road reserve is within Precinct 1 – conservation precinct.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
	<p>(a) Land which has been previously been lawfully cleared and currently remains cleared;</p> <p>(b) Land which is the subject of a current</p> <p>(c) Clearing Permit, but has yet to be cleared;</p> <p>(d) Land which is subject of a current Operational Works Permit, can be developed for a house subject to compliance with all relevant codes.</p> <p>In addition, minor extensions can be undertaken to an existing development, provided:</p> <p>(a) The extensions are limited to 30% of the existing gross floor area of the house at the commencement date of the planning scheme</p> <p>or</p> <p>(b) The extent of extensions are determined on a site specific/use specific basis for other land uses,</p> <p>or</p> <p>(c) No further clearing is required to accommodate the extension for either a house or any other land use development.</p>	
Additional requirements for Precinct 2– Low impact residential precinct		
PO19 Development is for; (a) a detached dwelling of limited size and scale and necessary outbuildings and infrastructure; (b) home occupations, including bed and breakfast accommodation, where it can be demonstrated that the bed and breakfast accommodation can establish	AO19.1 Development is limited to one dwelling house per lot.	Not applicable No dwelling is proposed.
	AO19.2 Establishment of bed and breakfast accommodation only occurs on land on which a dwelling house has been approved and constructed.	Not applicable No bed and breakfast accommodation is proposed.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
<p>on the site and not detrimentally impact on the scenic values of the site and surrounding areas;</p> <p>(c) Nature based tourism, being Forest stay accommodation where in compliance with other requirements contained within this code.</p>	<p>AO19.3 Bed and breakfast accommodation is limited to cleared areas on the land; or</p>	<p>Not applicable No bed and breakfast accommodation is proposed.</p>
	<p>AO19.4 Bed and breakfast accommodation is established within an existing house, where there is no additional vegetation clearing required to accommodate the use;</p>	<p>Not applicable No bed and breakfast accommodation is proposed.</p>
	<p>AO19.5 Bed and breakfast accommodation occurs on a site with a minimum area of 1 hectare, and thereafter occurs at a rate of 1 bedroom (2 beds) per hectare, up to a maximum of 4 bedrooms (8) beds per site.</p>	<p>Not applicable No bed and breakfast accommodation is proposed.</p>
	<p>AO19.6 Development is setback a minimum of 100 metres to an Esplanade or a foreshore frontage.</p>	<p>Not applicable No part of the internal road reserve is within a coastal area.</p>
Additional requirements for Precinct 3– Low impact commercial precinct		
<p>PO20 Commercial development is located in a convenient location and meets the requirements of the local community and visitors to the area.</p>	<p>AO20 Commercial development is located within Precinct 3 and has frontage to Cape Tribulation Road.</p>	<p>Not applicable Commercial development is not proposed for these operational works.</p>
<p>PO21 Development is small scale and provides a necessary service to the surrounding community.</p>	<p>AO21 No acceptable outcomes are prescribed.</p>	<p>Not applicable The works proposed within the lease plan internal road reserve including laying of underground cables (connecting PV arrays to the generation plant), road access works and drainage which are designed only to service the construction, operation and maintenance of the solar farm generation site.</p>

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
PO22 Development is carried out in accordance with a site-specific, and development specific Environmental Management Plan. Note – Planning scheme policy SC6.4 – Environmental management plans provides further guidance on meeting the performance outcome.	AO22 No acceptable outcomes are prescribed.	Complies The DMG project has developed an EMP that has previously been approved under other regulatory requirements (WTMA and EPBC). This EMP is attached as Appendix G.
Additional requirements for Precinct 4– Low impact community purpose precinct		
PO23 Development results in a small scale expansion of an existing use which provides a necessary service to the surrounding community; or Development results in a new community use or public purpose use for which there is an identified need within the surrounding community.	AO23 No acceptable outcomes are prescribed.	Not applicable The works proposed within the lease plan internal road reserve including laying of underground cables (connecting PV arrays to the generation plant), road access works and drainage which are designed only to service the construction, operation and maintenance of the solar farm generation site.
PO24 Development is carried out in accordance with a site specific and development specific Environmental Management Plan. Note – Planning scheme policy SC6.4 – Environmental management plans provides further guidance on meeting the performance outcome.	AO24 No acceptable outcomes are prescribed.	Complies The DMG project has developed an EMP that has previously been approved under other regulatory requirements (WTMA and EPBC). This EMP is attached as Appendix G.
Additional requirements for Precinct 5 - Low impact rural production and tourist enterprise precinct		

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
PO25 Development complements, protects and enhances the environmental and scenic values of the site.	AO25.1 One dwelling house establishes per lot.	Not applicable No dwelling proposed for project.
	AO25.2 Any other development is limited to existing cleared areas on the site.	Complies All operational works are within existing cleared areas within the internal lease plan road reserve.
	AO25.3 No development is to occur above the 60 metre contour line.	Complies No development within the solar farm generation site, including the internal road reserve, will occur above the 60m contour line.
	AO25.4 Any new primary production activity or a change to a primary production activity has minimal impact on the existing natural values of the site and surrounding area.	Not applicable No primary production activity proposed for this project..
PO26 Large cleared or partially cleared sites are revegetated and rehabilitated in association with suitably small scale environmentally sustainable development.	AO26 The balance area of the development, including any existing area/s not identified for development is/are revegetated / rehabilitated in accordance with a landscape plan.	Not applicable No revegetation/rehabilitation is required for the operational works component within the road reserve as the internal road reserve will be maintained clear of development.
PO27 Development is carried out in accordance with a site specific and development specific Environmental Management Plan. Note – Planning scheme policy SC6.4 – Environmental management plans provides further guidance on meeting the performance outcome.	AO27 No acceptable outcomes are prescribed.	Complies The DMG project has developed an EMP that has previously been approved under other regulatory requirements (WTMA and EPBC). This EMP is attached as Appendix G.

All development in the Cape Tribulation and Daintree Coast local plan area – assessable development		
Performance Outcome	Acceptable Outcomes	Proposed Development
Additional requirements for Precinct 6 – Low impact tourism accommodation precinct		
PO28 Development complements, protects and enhances the environmental and scenic values of the site.	AO28.1 One dwelling house establishes per lot.	Not applicable No dwelling house proposed.
	AO28.2 Any other development is limited to existing cleared areas on the site.	Complies All operational works are within cleared areas of the road reserve.
	AO28.3 No development is to occur above the 60 metre contour line.	Complies No works are proposed in the road reserve in the lease plan area above the 60m contour line.
PO29 Development results in a small scale expansion of existing tourist accommodation and any associated activities, based on the appreciation of the natural environment.	AO29 No acceptable outcomes are prescribed.	Not applicable The operational works within the road reserve is not specific to any tourist accommodation and will not result in any small scale expansion of tourism accommodation and any associated activities.
PO30 Development is carried out in accordance with a site specific and development specific Environmental Management Plan.	AO30 No acceptable outcomes are prescribed.	Complies The DMG project has developed an EMP that has previously been approved under other regulatory requirements (WTMA and EPBC). This EMP is attached as Appendix G.

7.2.2 Coastal communities local plan code

7.2.2.1 Application

- (1) This code applies to assessing development within the Coastal communities local plan area covering Wonga Beach, Newell and Cooya Beach as identified on the Coastal communities local plan maps contained in Schedule 2.

Response: Operational works in the road reserve within lot 5 BK157130 (lease plan area).

The 7.2.2 Coastal communities local plan code is not applicable as no part of the operational works will be undertaken in the area identified in local plan map LPM-003.

7.2.3 Mossman local plan code

7.2.3.1 Application

- (1) This code applies to development within the Mossman local plan area as identified on the Mossman local plan maps contained in Schedule 2.

Response: Operational works in the road reserve within lot 5 BK157130 (lease plan area)..

No part of the internal road reserve is within the Mossman and local plan area as identified in Local plan map LPM-004, Schedule 2. Hence 7.2.3 Mossman local plan code is not applicable

7.2.4 Port Douglas/Craigie local plan code

7.2.4.1 Application

- (1) This code applies to assessing development within the Port Douglas/Craigie local plan area as identified on the Port Douglas/Craigie local plan maps contained in Schedule 2.

Response: Operational works in the road reserve within lot 5 BK157130 (lease plan area)..

No part of the internal road reserve within the lease plan area is in the Port Douglas/Craigie local plan map LPM-005 as identified in Schedule 2. Hence 7.2.4 Port Douglas/Craigie local plan code is not applicable.

7.2.5 Return to Country local plan

7.2.5.1 Application

- (1) This code applies to assessing development within the Return to Country local plan area as identified on the Return to Country local plan maps contained in Schedule 2.

Response: Operational works in the road reserve within lot 5 BK157130 (lease plan area)..

No part of the internal road reserve within the lease plan area is within the Return to Country local map as identified in Schedule 2. Hence 7.2.5 Return to Country local plan code is not applicable.

9.4.3 Environmental performance code

Table 9.4.3.3.a Environmental performance code – assessable development

Performance outcomes		Acceptable outcomes
Lighting		
PO1 Lighting incorporated within development does not cause an adverse impact on the amenity of adjacent uses and nearby sensitive land uses.	AO1.1 Technical parameters, design, installation, operation and maintenance of outdoor lighting comply with the requirements of Australian standard AS4282-1997 Control of the obtrusive effects of outdoor lighting.	Not applicable No outdoor lighting proposed for the electrical distribution system within the internal lease plan area road reserve
	AO1.2 Development that involves flood lighting is restricted to a type that gives no upward component of light where mounted horizontally.	Not applicable No outdoor lighting proposed for the electrical distribution system within the internal lease plan area road reserve
	AO1.3 Access, car parking and manoeuvring areas are designed to shield nearby residential premises from impacts of vehicle headlights.	Complies No construction work will occur after 5pm. No access, carparking and manoeuvring areas are proposed as part of the works within the road reserve.
Noise		
PO2 Potential noise generated from the development is avoided through design, location and operation of the activity. Note – Planning Scheme Policy SC6.4 – Environmental management plans provides guidance on preparing a report to demonstrate compliance with the purpose and outcomes of the code	AO2.1 Development does not involve activities that would cause noise related environmental harm on nuisance. or environmental harm or nuisance with respect to surrounding land uses.	Not applicable There are no sound generating developments proposed for the lease plan area internal road reserve. Works are associated with drainage, underground cable laying, and access construction.

Performance outcomes		Acceptable outcomes
	AO2.2 Development ensures noise does not emanate from the site through the use of materials, structures and architectural features to not cause an adverse noise impact on adjacent uses	Not applicable There are no sound generating developments proposed for the lease plan area internal road reserve. Works are associated with drainage, underground cable laying, and access construction
	AO2.3 The design and layout of development ensures car parking areas avoid noise impacting directly on adjacent sensitive land uses through one or more of the following: (a) car parking is located away from adjacent sensitive land uses; (b) car parking is enclosed within a building; (c) a noise ameliorating fence or structure is established adjacent to car parking areas where the fence or structure will not have a visual amenity impact on the adjoining premises; (d) buffered with dense landscaping. <small>Editor's note - The <i>Environmental Protection (Noise) Policy 2008</i>, Schedule 1 provides guidance on acoustic quality objectives to ensure environmental harm (including nuisance) is avoided.</small>	Not applicable No car parking areas proposed as part of the works within the road reserve.
Airborne particles and other emissions		
PO3 Potential airborne particles and emissions generated from the development are avoided through design, location and operation of the activity. <small>Note – Planning Scheme Policy SC6.4 – Environmental management plans provides guidance on preparing a report to demonstrate compliance with the purpose and outcomes of the</small>	AO3.1 Development does not involve activities that will result in airborne particles or emissions being generated; or	Not applicable There are no emission generating developments proposed for the lease plan area internal road reserve. Works are associated with drainage, underground cable laying, and access construction

Performance outcomes		Acceptable outcomes
code.		<p>AO3.2</p> <p>The design, layout and operation of the development activity ensures that no airborne particles or emissions cause environmental harm or nuisance.</p> <p>Note - examples of activities which generally cause airborne particles include spray painting, abrasive blasting, manufacturing activities and car wash facilities.</p> <p>Examples of emissions include exhaust ventilation from basement or enclosed parking structures, air conditioning/refrigeration ventilation and exhaustion</p> <p>The <i>Environmental Protection (Air) Policy 2008</i>, Schedule 1 provides guidance on air quality objectives to ensure environmental harm (including nuisance) is avoided.</p>
Odours		
<p>PO4</p> <p>Potential odour causing activities associated with the development are avoided through design, location and operation of the activity.</p> <p>Note – Planning Scheme Policy SC6.4 – Environmental management plans provides guidance on preparing a report to demonstrate compliance with the purpose and outcomes of the code.</p>	<p>AO4.1</p> <p>The development does not involve activities that create odorous emissions;</p> <p>or</p>	<p>Not applicable</p> <p>There are no components of the proposed works that create odorous emissions.</p>
	<p>AO4.2</p> <p>The use does not result in odour that causes environmental harm or nuisance with respect to surrounding land uses.</p>	<p>Not applicable</p> <p>There are no components of the proposed works that create odorous emissions.</p>

Performance outcomes		Acceptable outcomes	
Waste and recyclable material storage			
PO5 Waste and recyclable material storage facilities are located and maintained to not cause adverse impacts on adjacent uses. 			

Performance outcomes		Acceptable outcomes
PO6 Sensitive land use activities are not established in areas which will receive potentially incompatible impacts on amenity from surrounding, existing development activities and land uses	AO6.1 Sensitive land use activities are not established in areas that will be adversely impacted upon by existing land uses, activities and potential development possible in an area;	Complies The drainage works, access road and underground cable laying activities are not a sensitive land use activity.
	or AO6.2 Sensitive land activities are located in areas where potential adverse amenity impacts mitigate all potential impacts through layout, design, operation and maintenance.	Complies The drainage works, access road and underground cable laying activities are not a sensitive land use activity.
Stormwater quality		
PO7 The quality of stormwater flowing over, through or being discharged from development activities into watercourses and drainage lines is of adequate quality for downstream environments, with respect to: (a) the amount and type of pollutants borne from the activity; (b) maintaining natural stream flows; (c) the amount and type of site disturbance; (d) site management and control measures	AO7.3 Soil and water control measures are incorporated into the activity's design and operation to control sediment and erosion potentially entering watercourses, drainage lines and downstream receiving waters. Note - Planning scheme policy - FNQROC Regional Development Manual provides guidance on soil and water control measures to meet the requirements of the <i>Environmental Protection Act 1994</i> . During construction phases of development, contractors and builders are to have consideration in their work methods and site preparation for their environmental duty to protect stormwater quality.	Complies Works proposed within the internal road reserve include underground cable laying, drainage, and road access to the generation site. Refer drawings DRE-ELE-GAR-1001, DRE-ELE-GAR-1002, DRE-ELE-GAR-1004, and DRE-CIV-GAR-1021 (Appendix E) The site contractor will prepare an Erosion and Sediment Control Plan (ESCP) compliant with the International Erosion Control Association (IECA) guidelines, the WTMA "Roads in the Wet Tropics" best practice guideline, and the FNQROC Regional Development Manual.. The design of the works has specifically taken into account minimal earthworks and no vegetation clearing being required. Pollutants potentially arising from the activity will comprise only sediment, as there are no liquids,

Performance outcomes		Acceptable outcomes
		e.g. transformer oils, or any other potential contaminant to be used in the internal road reserve.
Pest plants (for material change of use on vacant land over 1,000m²)		
<p>PO8 Development activities and sites provide for the removal of all pest plants and implement ongoing measures to ensure that pest plants do not reinfest the site or nearby sites.</p> <p>Editor's note - This does not remove or replace all land owner's obligations or responsibilities under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i>.</p>	<p>AO8.1 The land is free of declared pest plants before development establishes new buildings, structures and practices; or</p>	<p>Complies Surveys of the solar farm generation site, including the internal road reserve, have identified no plant species considered to be pests. A Biosecurity Management Element has been included in the DMG project EMP (Appendix G).</p>
	<p>AO8.2 Pest plants detected on a development site are removed in accordance with a management plan prepared by an appropriately qualified person prior to construction of buildings and structures or earthworks.</p> <p>Note - A declaration from an appropriately qualified person validates the land being free from pest plants.</p> <p>Declared pest plants include locally declared and State declared pest plants.</p>	<p>Complies Surveys of the solar farm generation site, including the internal road reserve, have identified no plant species considered to be pests. A Biosecurity Management Element has been included in the DMG project EMP (Appendix G).</p>

9.4.5 Infrastructure works code

Table 9.4.5.3.a – Infrastructure works code –assessable development

Performance outcomes		Acceptable outcomes	
For self-assessable and assessable development			
Compatible development			
PO1 Works on a local government road do not adversely impact on footpaths or existing infrastructure within the road verge and maintain the flow safety and efficiency of pedestrians, cyclists and vehicles,	AO1.1 Footpaths/pathways are located in the road verge and are provided for the hierarchy of the road and located and designed and constructed in accordance with Planning scheme policy SC5 – FNQROC Regional Development Manual.	Not applicable No footpaths or pathways are proposed for the internal road reserve	
	AO1.2 Kerb ramp crossovers are constructed in accordance with Planning scheme policy SC 5 – FNQROC Regional Development Manual.	Not applicable No kerb ramp crossovers proposed.	
	AO1.3 New pipes, cables, conduits or other similar infrastructure required to cross existing footpaths: (a) are installed via trenchless methods; or (b) footpath infrastructure is removed to install infrastructure, the new section of footpath is installed to the standard detailed in the Planning scheme policy SC5-FNQROC Regional Development Manual and is no less than a 1.2 metre section.	Not applicable No existing footpaths present.	
	AO1.4 Where existing footpaths are damaged as a result of development, footpaths are reinstated ensuring: (a) similar surface finishes are used;	Not applicable No existing footpaths present.	

Performance outcomes		Acceptable outcomes	
		(b) there is no change in level at joins of new and existing sections; (c) new sections are matched to existing in terms of dimension and reinforcement. Note – Figure 9.4.5.3.a provides guidance on meeting the outcomes.	
Accessibility structures			
PO2 Development is designed to ensure it is accessible for people of all abilities and accessibility features do not impact on the efficient and safe use of footpaths. Note – Accessibility features are those features required to ensure access to premises is provided for people of all abilities and include ramps and lifts.	AO2.1	Accessibility structures are not located within the road reserve.	Not applicable No accessibility structures are proposed for the works within the road reserve.
	AO2.2	Accessibility structures are designed in accordance with AS1428.3	Not applicable No accessibility structures are proposed for the works within the road reserve.
	AO2.3	When retrofitting accessibility features in existing buildings, all structures and changes in grade are contained within the boundaries of the lot and not within the road reserve.	Not applicable No accessibility structures are proposed for the works within the road reserve.
Water supply			
PO3 An adequate, safe and reliable supply of potable, fire fighting and general use water is provided.	AO3.1	The premises is connected to Council's reticulated water supply system in accordance with the Design Guidelines set out in Section D6 of the Planning scheme policy SC5 – FNQROC Regional Development Manual; or	Not applicable No water supply is proposed for the works within the road reserve.
	AO3.2	Where a reticulated water supply system is not available to the premises, on site water storage tank/s with a minimum capacity of 10,000 litres of stored water, with a minimum 7,500 litre tank, with	Not applicable No water supply is proposed for the works within the road reserve.

Performance outcomes		Acceptable outcomes
		the balance from other sources (e.g. accessible swimming pool, dam etc.) and access to the tank/s for fire trucks is provided for each new house or other development. Tank/s are to be fitted with a 50mm ball valve with a camlock fitting and installed and connected prior to occupation of the house and sited to be visually unobtrusive.
Non tidal artificial waterways		
PO6 Development involving non-tidal artificial waterways is planned, designed, constructed and operated to: <ul style="list-style-type: none"> (a) protect water environmental values; (b) be compatible with the land use constraints for the site for protecting water environmental values; (c) be compatible with existing tidal and non-tidal waterways; (d) perform a function in addition to stormwater management; achieve water quality objectives.	AO6.1 Development involving non-tidal artificial waterways ensures: <ul style="list-style-type: none"> (a) environmental values in downstream waterways are protected; (b) any ground water recharge areas are not affected; (c) the location of the waterway incorporates low lying areas of the catchment connected to an existing waterway; (d) existing areas of ponded water are included 	Not applicable No non-tidal artificial waterways are proposed for this project.
	AO6.2 Non-tidal artificial waterways are located: <ul style="list-style-type: none"> (a) outside natural wetlands and any associated buffer areas; (b) to minimise disturbing soils or sediments; (c) to avoid altering the natural hydrologic regime in acid sulfate soil and nutrient hazardous areas. 	Not applicable No non-tidal artificial waterways are proposed for this project.
	AO6.3 Non-tidal artificial waterways located adjacent to, or connected to a tidal waterway by means of a weir, lock, pumping system or similar	Not applicable No non-tidal artificial waterways are proposed for this project.

Performance outcomes	Acceptable outcomes	
	<p>ensures:</p> <ul style="list-style-type: none"> (a) there is sufficient flushing or a tidal range of >0.3 m; or (b) any tidal flow alteration does not adversely impact on the tidal waterway; or (c) there is no introduction of salt water into freshwater environments. 	
	<p>AO6.4</p> <p>Non-tidal artificial waterways are designed and managed for any of the following end-use purposes:</p> <ul style="list-style-type: none"> (a) amenity (including aesthetics), landscaping or recreation; or (b) flood management, in accordance with a drainage catchment management plan; or (c) stormwater harvesting plan as part of an integrated water cycle management plan; or (d) aquatic habitat. 	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>
	<p>AO6.5</p> <p>The end-use purpose of the non-tidal artificial waterway is designed and operated in a way that protects water environmental values.</p>	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>
	<p>AO6.6</p> <p>Monitoring and maintenance programs adaptively manage water quality to achieve relevant water quality objectives downstream of the waterway.</p>	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>
	<p>AO6.7</p> <p>Aquatic weeds are managed to achieve a low percentage of coverage of the water surface area, and pests and vectors are managed through design</p>	<p>Not applicable</p> <p>No non-tidal artificial waterways are proposed for this project.</p>

Performance outcomes	Acceptable outcomes	
	and maintenance.	
Wastewater discharge		
PO7 Discharge of wastewater to waterways, or off site: (a) meets best practice environmental management; (b) is treated to: (i) meet water quality objectives for its receiving waters; (ii) avoid adverse impact on ecosystem health or waterway health; (iii) maintain ecological processes, riparian vegetation and waterway integrity; (iv) offset impacts on high ecological value waters	A07.1 A wastewater management plan is prepared and addresses: (a) wastewater type; (b) climatic conditions; (c) water quality objectives; (d) best practice environmental management.	Not applicable Road reserve works are limited to drainage, access construction and underground cable laying. No wastewater producing development proposed within the road reserve.
	A07.2 The waste water management plan is managed in accordance with a waste management hierarchy that: (a) avoids wastewater discharge to waterways; or (b) if wastewater discharge cannot practicably be avoided, minimises wastewater discharge to waterways by re-use, recycling, recovery and treatment for disposal to sewer, surface water and ground water.	Not applicable Road reserve works are limited to drainage, access construction and underground cable laying. No wastewater producing development proposed within the road reserve.
	A07.3 Wastewater discharge is managed to avoid or minimise the release of nutrients of concern so as to minimise the occurrence, frequency and intensity of algal blooms.	Not applicable Road reserve works are limited to drainage, access construction and underground cable laying. No wastewater producing development proposed within the road reserve.
	A07.4 Development in coastal catchments avoids or minimises and appropriately manages soil disturbance or altering natural hydrology and: (a) avoids lowering ground water levels	Not applicable Road reserve works are limited to drainage, access construction and underground cable laying. No wastewater producing development proposed within the road reserve.

Performance outcomes	Acceptable outcomes	
	<p>where potential or actual acid sulfate soils are present;</p> <p>(b) manages wastewater so that:</p> <p>(i) the pH of any wastewater discharges is maintained between 6.5 and 8.5 to avoid mobilisation of acid, iron, aluminium and other metals;</p> <p>(ii) holding times of neutralised wastewater ensures the flocculation and removal of any dissolved iron prior to release;</p> <p>visible iron floc is not present in any discharge;</p> <p>(iv) precipitated iron floc is contained and disposed of;</p> <p>(iii) wastewater and precipitates that cannot be contained and treated for discharge on site are removed and disposed of through trade waste or another lawful method.</p>	
Electricity supply		
PO8 Development is provided with a source of power that will meet its energy needs.	AO8.1 A connection is provided from the premises to the electricity distribution network;	Not applicable The internal road reserve does not form part of the electricity distribution network.
	or AO8.2 The premises is connected to the electricity distribution network in accordance with the Design Guidelines set out in Section D8 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.	Not applicable The internal road reserve does not form part of the electricity distribution network.
	Note - Areas north of the Daintree River have a different	

Performance outcomes		Acceptable outcomes
		standard.
PO9 Development incorporating pad-mount electricity infrastructure does not cause an adverse impact on amenity.	AO9.1 Pad-mount electricity infrastructure is: (a) not located in land for open space or sport and recreation purposes; (b) screened from view by landscaping or fencing; (c) accessible for maintenance.	Not applicable No pad mounted electricity infrastructure is proposed to be located within the internal road reserve.
	AO9.2 Pad-mount electricity infrastructure within a building, in a Town Centre is designed and located to enable an active street frontage. Note – Pad-mounts in buildings in activity centres should not be located on the street frontage.	Not applicable The solar farm generation site road reserve is not within a town centre.
Telecommunications		
PO10 Development is connected to a telecommunications service approved by the relevant telecommunication regulatory authority.	AO10 The development is connected to telecommunications infrastructure in accordance with the standards of the relevant regulatory authority.	Not applicable No telecommunications are required as part of the operational work in the road reserve.
PO11 Provision is made for future telecommunications services (e.g. fibre optic cable).	AO11 Conduits are provided in accordance with Planning scheme policy SC5 – FNQROC Regional Development Manual.	Not applicable No telecommunications are required as part of the operational work in the road reserve.

Performance outcomes		Acceptable outcomes
Road construction		
PO12 The road to the frontage of the premises is constructed to provide for the safe and efficient movement of: (a) pedestrians and cyclists to and from the site; (b) pedestrians and cyclists adjacent to the site; (c) vehicles on the road adjacent to the site; (d) vehicles to and from the site; (e) emergency vehicles.	AO12.1 The road to the frontage of the site is constructed in accordance with the Design Guidelines set out in Sections D1 and D3 of the Planning scheme policy SC5 – FNQROC Regional Development Manual, for the particular class of road, as identified in the road hierarchy.	Complies All construction, installation and maintenance will be accessed via existing Silkwood Road which has direct frontage to the solar farm generation site and the internal road reserve. Refer drawing DRE-ELE-GAR-1004 for proposed access.
	AO12.2 There is existing road, kerb and channel for the full road frontage of the site.	Complies The internal road reserve within the solar farm lease area is directly connected to Silkwood Road, which is maintained by Douglas Shire Council with a road side drain (spoon drain), however there is no formed kerb and channel. Refer drawing DRE-ELE-GAR-1004 for proposed access.
	AO12.3 Road access minimum clearances of 3.5 metres wide and 4.8 metres high are provided for the safe passage of emergency vehicles.	Complies Access to the solar farm generation site will allow safe passage for the emergency vehicles in the dimensions noted. Refer drawing of access security gate DRE-CIV-GAR-1016
Alteration and repairs to public utility services		
PO13 Infrastructure is integrated with, and efficiently extends, existing networks..	AO13 Development is designed to allow for efficient connection to existing infrastructure networks.	Not applicable Drainage, cable laying works and access track construction within the lease plan area internal road are not designed to extend the existing road network.
PO14 Development and works do not affect the efficient functioning of public utility mains, services or installations.	AO14.1 Public utility mains, services and installations are not required to be altered or repaired as a result of the development. or	Complies No public utility mains, services or installations are located within the internal road reserve of the solar farm lease plan area.

Performance outcomes		Acceptable outcomes
		AO14.2 Public utility mains, services and installations are altered or repaired in association with the works so that they continue to function and satisfy the relevant Design Guidelines set out in Section D8 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.
		Complies No public utility mains, services or installations are located within the internal road reserve of the solar farm lease plan area.
Construction management		
PO15 Work is undertaken in a manner which minimises adverse impacts on vegetation that is to be retained.	AO15 Works include, at a minimum: (a) installation of protective fencing around retained vegetation during construction; (b) erection of advisory signage; (c) no disturbance, due to earthworks or storage of plant, materials and equipment, of ground level and soils below the canopy of any retained vegetation; (d) removal from the site of all declared noxious weeds.	Complies The internal road reserve through the solar farm lease plan area is cleared. No vegetation clearing will be undertaken, and earthworks will be managed through an ESCP and in accordance with the requirements of the DMG project EMP (Appendix G).
PO16 Existing infrastructure is not damaged by construction activities.	AO16 Construction, alterations and any repairs to infrastructure is undertaken in accordance with the Planning scheme policy SC5 – FNQROC Regional Development Manual. Note - Construction, alterations and any repairs to State-controlled roads and rail corridors are undertaken in accordance with the Transport Infrastructure Act 1994.	Will comply All disturbance, construction and repairs to infrastructure will be reinstated in accordance with direction and agreements with DSC, and with the relevant design guidelines in the Section D8 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.

Performance outcomes		Acceptable outcomes	
For assessable development			
High speed telecommunication infrastructure			
PO17 Development provides infrastructure to facilitate the roll out of high speed telecommunications infrastructure.	AO17 No acceptable outcomes are prescribed.	Not applicable No high speed telecommunications proposed as part of this project.	
Trade waste			
PO18 Where relevant, the development is capable of providing for the storage, collection treatment and disposal of trade waste such that: (a) off-site releases of contaminants do not occur; (b) the health and safety of people and the environment are protected; (c) the performance of the wastewater system is not put at risk.	AO18 No acceptable outcomes are prescribed.	Not applicable No trade waste storage, collection and disposal is proposed for this project. There are no transformer oils or similar liquid / solid wastes associated with the operation of the distribution network.	
Fire services in developments accessed by common private title			
PO19 Hydrants are located in positions that will enable fire services to access water safely, effectively and efficiently.	AO19.1 Residential streets and common access ways within a common private title places hydrants at intervals of no more than 120 metres and at each intersection. Hydrants may have a single outlet and be situated above or below ground.	Not applicable No fire services proposed by the operational works within the road reserve network.	
	AO19.2 Commercial and industrial streets and access ways within a common private title serving commercial properties such as factories and warehouses and offices are provided with above or below ground fire hydrants located at not more than 90 metre intervals and at each intersection.	Not applicable No fire services proposed by the operational works within the road reserve network.	

Performance outcomes	Acceptable outcomes	
	Above ground fire hydrants have dual-valved outlets.	
<p>PO20</p> <p>Hydrants are suitable identified so that fire services can locate them at all hours.</p> <p>Note – Hydrants are identified as specified in the Department of Transport and Main Roads Technical Note: 'Identification of street hydrants for fire fighting purposes' available under 'Publications'.</p>	<p>AO20</p> <p>No acceptable outcomes are prescribed.</p>	<p>Not applicable</p> <p>No fire services proposed by the operational works within the road reserve network.</p>
<p>PO8</p> <p>The development design responds to the potential threat of bushfire and establishes clear evacuation routes which demonstrate an acceptable or tolerable risk to people.</p>	<p>AO8</p> <p>The lot layout:</p> <ul style="list-style-type: none"> (a) minimises the length of the development perimeter exposed to, or adjoining hazardous vegetation; (b) avoids the creation of potential bottle-neck points in the movement network; (c) establishes direct access to a safe assembly /evacuation area in the event of an approaching bushfire; and (d) ensures roads likely to be used in the event of a fire are designed to minimise traffic congestion. <p>Note - For example, developments should avoid finger-like or hour-glass subdivision patterns or substantive vegetated corridors between lots.</p> <p>In order to demonstrate compliance with the performance outcome, a bushfire management plan prepared by a suitably qualified person may be required. The bushfire management plan should be developed in accordance with the Public Safety Business Agency (PSBA) guideline entitled "Undertaking a Bushfire Protection Plan.</p> <p>Advice from the Queensland Fire and Emergency Services (QFES) should be sought as appropriate</p>	<p>Complies</p> <p>The proposed works are within an existing road reserve that will be maintained only as an access route to/from the main solar farm generation thereby maintain clear evacuation routes in a hazardous situation.</p>

Appendix L – Douglas Shire Council Planning Scheme Overlays

2018 Douglas Shire Council Planning Scheme Property Report

The following report has been automatically generated to provide a general indication of development related information applying to the premise.

For more information and to determine if the mapping layers are applicable, refer to the [2018 Douglas Shire Council Planning Scheme](#). This report is not intended to replace the need for carrying out a detailed assessment of Council and State controls or the need to seek your own professional advice on any town planning instrument, local law or other controls that may impact on the existing or intended use of the premise mentioned in this report. For further information please contact Council by phone: [07 4099 9444](tel:0740999444) or [1800 026 318](tel:1800026318) or email enquiries@douglas.qld.gov.au.

Visit Council's website to apply for an [official property search or certificate](#), or contact the [Department of Natural Resources, Mines and Energy](#) to undertake a title search to ascertain how easements may affect a premise.

Property Information

Property Address [174 Buchanan Creek Road COW BAY](#)

Lot Plan [5BK157130](#) (Freehold - 647500m²)



☒ Selected Property

☐ Easements

☐ Property

Douglas Shire Planning Scheme 2018 version 1.0

The table below provides a summary of the Zones and Overlays that apply to the selected property.

Zoning










Applicable Zone
Conservation

More Information

- [View Section 6.2.3 Conservation Zone Code](#)
- [View Section 6.2.3 Conservation Zone Compliance table](#)
- [View Section 6.2.3 Conservation Zone Assessment table](#)

Douglas Shire Planning Scheme 2018 version 1.0

The table below provides a summary of the Zones and Overlays that apply to the selected property.

 Local Plans	Applicable Precinct or Area Diwan - Cow Bay Precinct 5	More Information
 Acid Sulfate Soils	Applicable Precinct or Area Acid Sulfate Soils (5-20m AHD)	More Information <ul style="list-style-type: none"> View Section 8.2.1 Acid Sulfate Soils Overlay Code View Section 8.2.1 Acid Sulfate Soils Overlay Compliance table
 Flood Storm	Applicable Precinct or Area Floodplain Assessment Overlay (Daintree River)	More Information <ul style="list-style-type: none"> View Section 8.2.4 Flood and Storm Tide Hazard Overlay Code View Section 8.2.4 Flood and Storm Tide Hazard Overlay Compliance table
 Hillslopes	Applicable Precinct or Area Area Affected by Hillslopes	More Information <ul style="list-style-type: none"> View Section 8.2.5 Hillslopes Overlay Code View Section 8.2.5 Hillslopes Overlay Compliance table
 Landscape Values	Landscape Values High landscape values	More Information <ul style="list-style-type: none"> View Section 8.2.6 Landscape Values Overlay Code View Section 8.2.6 Landscape Values Overlay Compliance table
 Landslide	Applicable Precinct or Area Landslide Hazard (High & Medium Hazard Risk)	More Information <ul style="list-style-type: none"> View Section 8.2.9 Potential Landslide Hazard Overlay Code View Section 8.2.9 Potential Landslide Hazard Overlay Compliance table
 Natural Areas	Applicable Precinct or Area MSES - Regulated Vegetation (Intersecting a Watercourse) MSES - High Ecological Value Waters (Watercourse) MSES - Wildlife Habitat MSES - Regulated Vegetation	More Information <ul style="list-style-type: none"> View Section 8.2.7 Natural Areas Overlay Code View Section 8.2.7 Natural Areas Overlay Compliance table
 Transport Pedestrian Cycle	Applicable Precinct or Area Neighbourhood Route	More Information <ul style="list-style-type: none"> View Section 8.2.10 Transport Network Overlay Code View Section 8.2.10 Transport Network Overlay Compliance table
 Transport Road Hierarchy	Applicable Precinct or Area Access Road	More Information <ul style="list-style-type: none"> View Section 8.2.10 Transport Network Overlay Code View Section 8.2.10 Transport Network Overlay Compliance table

Zoning

Applicable Zone
Conservation

- More Information
- [View Section 6.2.3 Conservation Zone Code](#)
 - [View Section 6.2.3 Conservation Zone Compliance table](#)
 - [View Section 6.2.3 Conservation Zone Assessment table](#)



☒ Selected Property

☐ Property

Zoning

<input type="checkbox"/> Centre	<input type="checkbox"/> Community Facilities	<input type="checkbox"/> Conservation	<input type="checkbox"/> Environmental Management
<input type="checkbox"/> Industry	<input type="checkbox"/> Low Density Residential	<input type="checkbox"/> Low-medium Density Residential	<input type="checkbox"/> Medium Density Residential
<input type="checkbox"/> Recreation and Open Space	<input type="checkbox"/> Rural	<input type="checkbox"/> Rural Residential	<input type="checkbox"/> Special Purpose
<input type="checkbox"/> Tourism	<input type="checkbox"/> Tourist Accommodation		

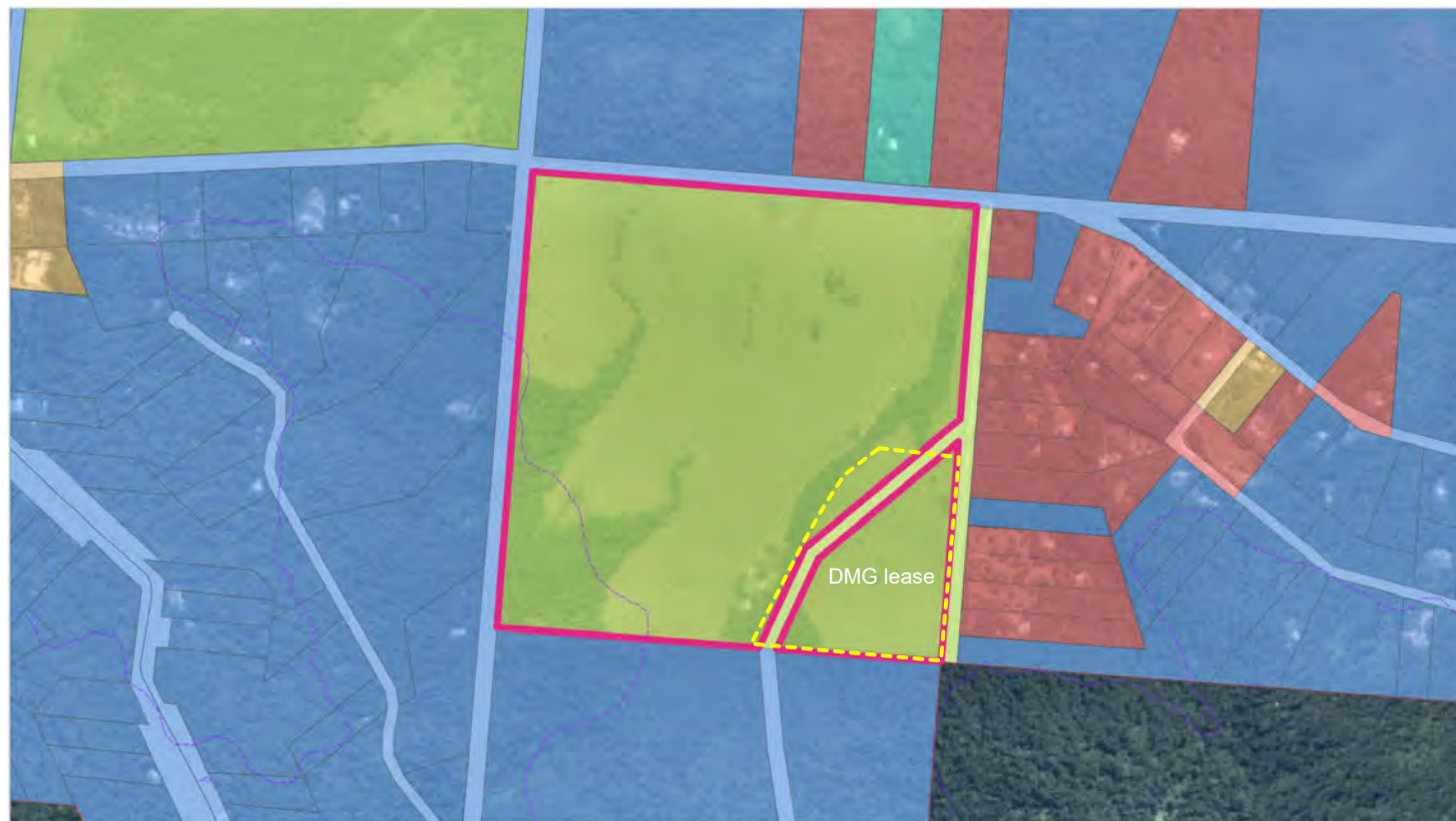
Local Plans

Applicable Precinct or Area

Diwan - Cow Bay

Precinct 5

More Information



Selected Property

Property

Transport Investigation Corridor

Transport Investigation Corridors

Major Road Connections

Major Road Connections

Major Road Connections (No Arrow)

Major Road Connections

Daintree River to Bloomfield

Daintree River to Bloomfield

Creb Track and Quaid Road

Creb Track

60 metre contour

60 metre contour

Local Plan Boundary

Local Plan Boundary

Local Plan Sub Precincts

1d Limited Development

1a Town Centre

1e Community and Recreation

1b Waterfront North

1f Flagstaff Hill

1c Waterfront South

Local Plan Precincts

Not Part of a Precinct

Precinct 4

Precinct 8

Precinct 1

Precinct 5

Precinct 9

Precinct 2

Precinct 6

Precinct 3

Precinct 7

Live Entertainment Precinct

Live Entertainment Precinct

Indicative Future Open Space

Indicative Future Open Space

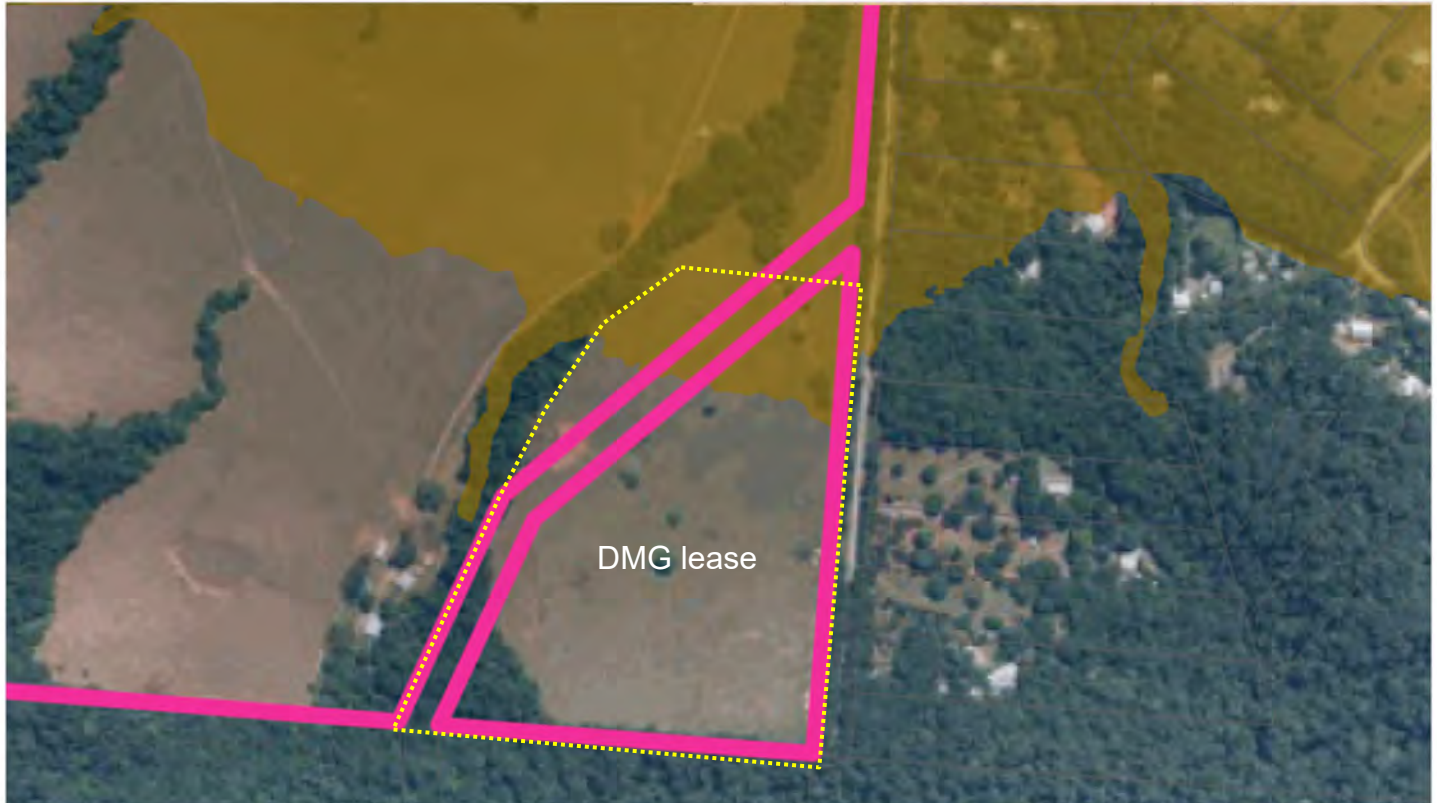
Road Reserve Esplanade

Acid Sulfate Soils

Applicable Precinct or Area
Acid Sulfate Soils (5-20m AHD)

More Information

- [View Section 8.2.1 Acid Sulfate Soils Overlay Code](#)
- [View Section 8.2.1 Acid Sulfate Soils Overlay Compliance table](#)



☒ Selected Property

☐ Property

Acid Sulfate Soils

☒ Acid Sulfate Soils (< 5m AHD)

☒ Acid Sulfate Soils (5-20m AHD)

☐ all others

Flood Storm

Applicable Precinct or Area

Floodplain Assessment Overlay (Daintree River)


More Information


- [View Section 8.2.4 Flood and Storm Tide Hazard Overlay Code](#)
- [View Section 8.2.4 Flood and Storm Tide Hazard Overlay Compliance table](#)




☒ Selected Property

☐ Property

 Medium Storm Tide Hazard

 High Storm Tide Hazard

 100 Year ARI - Mossman Port Douglas and Daintree Flood Studies

 Floodplain Assessment Overlay

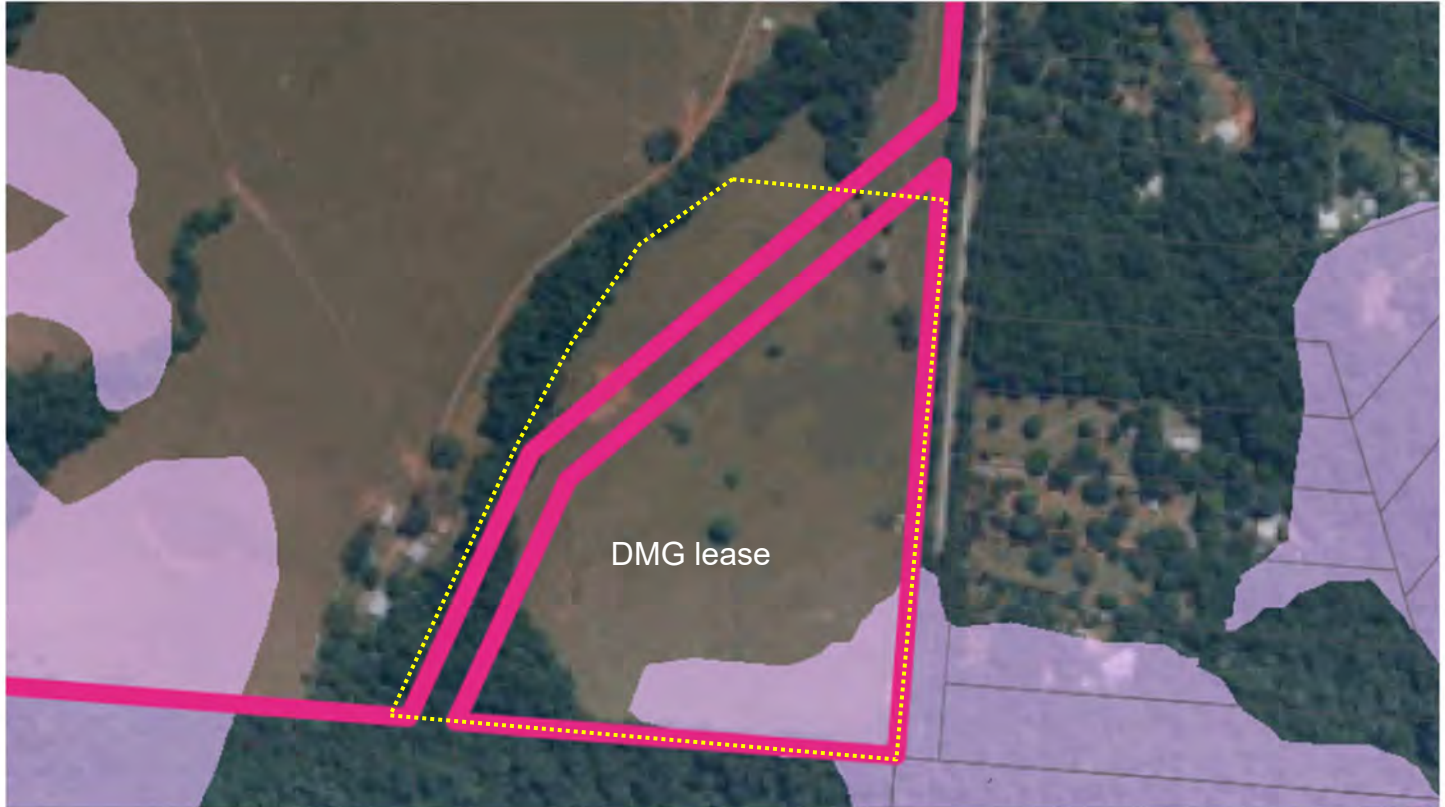
Hillslopes

Applicable Precinct or Area

Area Affected by Hillslopes

More Information

- [View Section 8.2.5 Hillslopes Overlay Code](#)
- [View Section 8.2.5 Hillslopes Overlay Compliance table](#)



Selected Property



Property

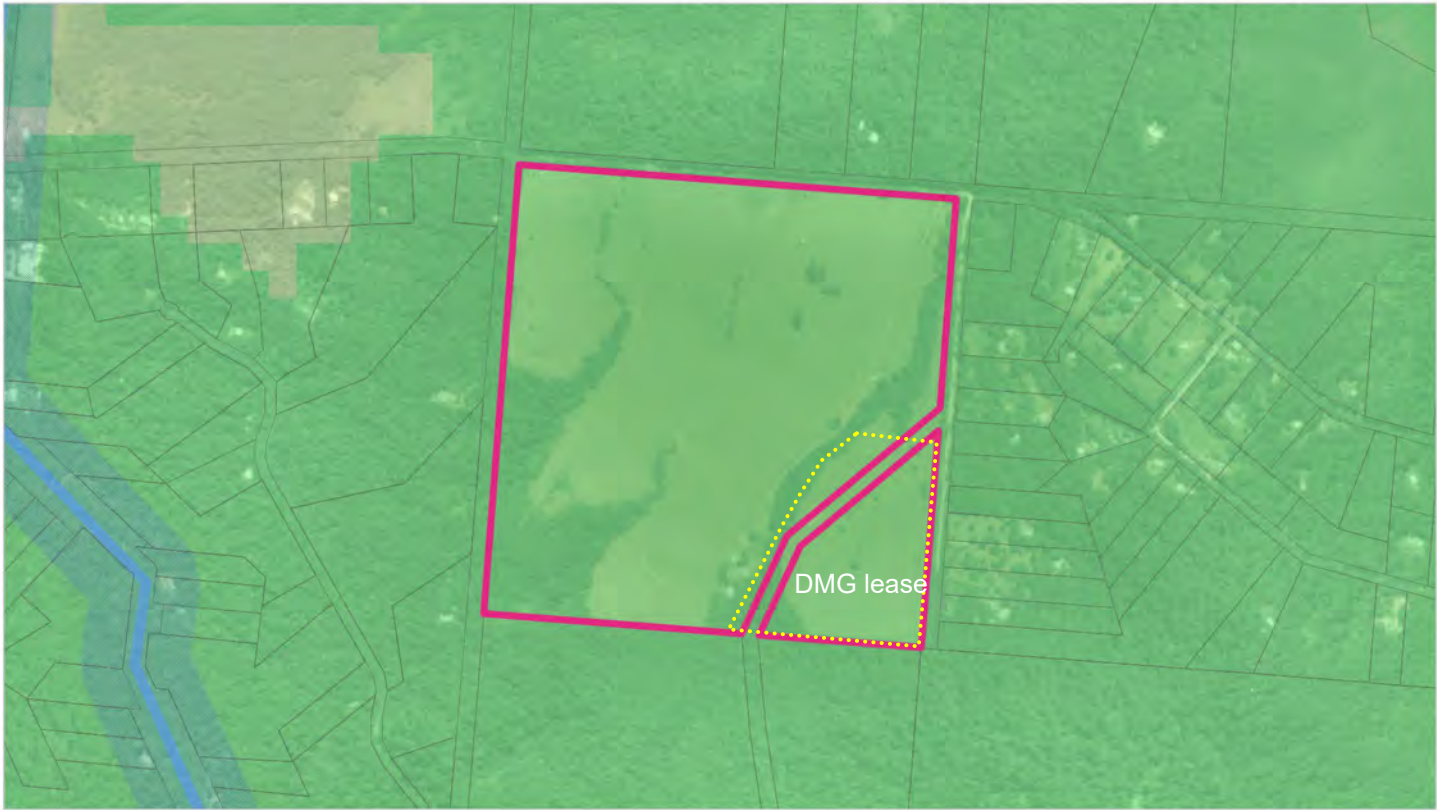


Area Affected by Hillslopes

Landscape Values

Landscape Values
High landscape values

- More Information
- [View Section 8.2.6 Landscape Values Overlay Code](#)
 - [View Section 8.2.6 Landscape Values Overlay Compliance table](#)



<input checked="" type="checkbox"/> Selected Property	<input type="checkbox"/> Property	Scenic Buffer Area			
		<input checked="" type="checkbox"/> Gateway	<input checked="" type="checkbox"/> Lookout	<input checked="" type="checkbox"/> Scenic route	<input checked="" type="checkbox"/> Scenic route buffer
		<input checked="" type="checkbox"/> View corridor	<input type="checkbox"/> all others		

Landscape Values			
<input checked="" type="checkbox"/> Coastal scenery	<input checked="" type="checkbox"/> High landscape values	<input checked="" type="checkbox"/> Medium Landscape Value	<input type="checkbox"/> all others

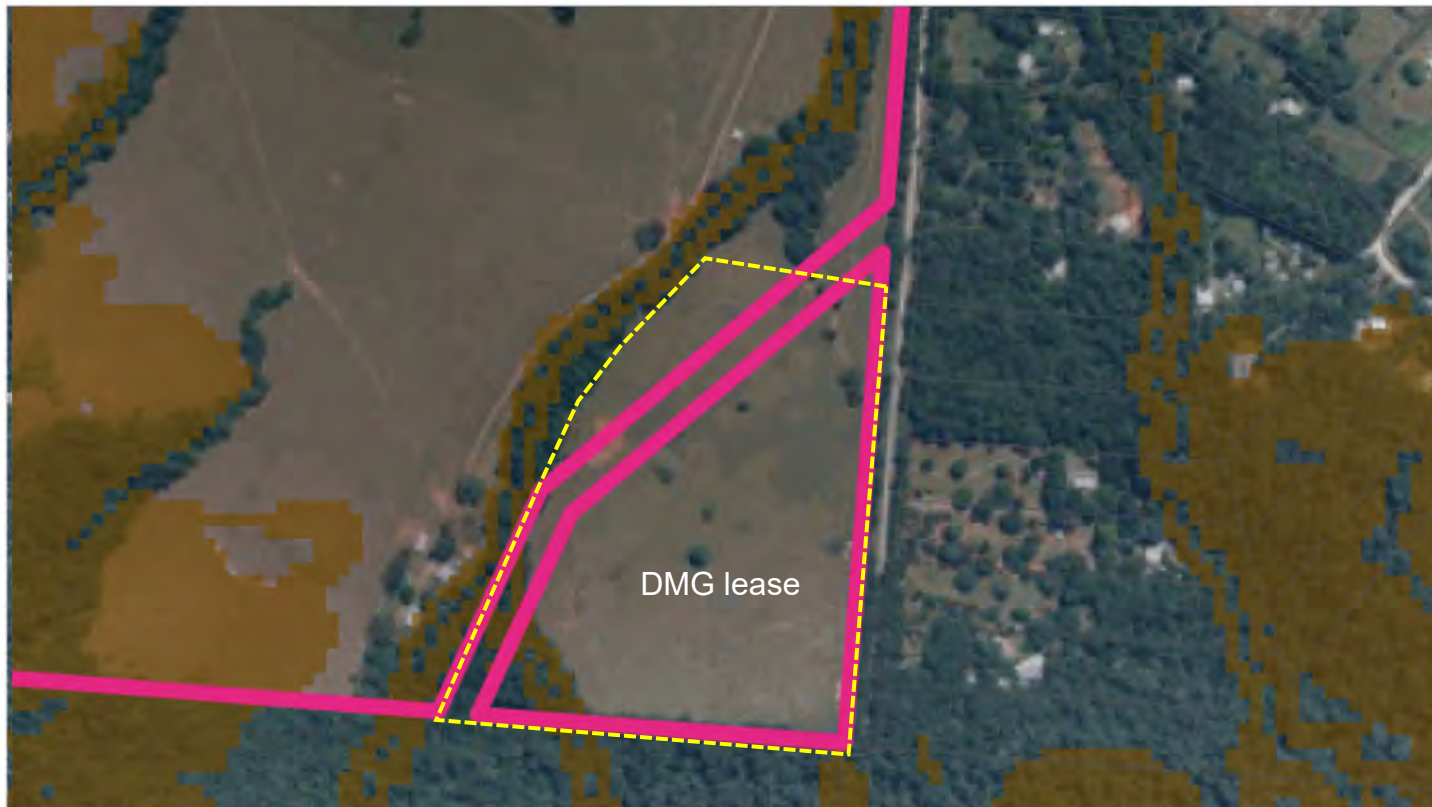
Landslide

Applicable Precinct or Area

Landslide Hazard (High & Medium Hazard Risk)

More Information

- [View Section 8.2.9 Potential Landslide Hazard Overlay Code](#)
- [View Section 8.2.9 Potential Landslide Hazard Overlay Compliance table](#)



☒ Selected Property

☐ Property

☒ Potential Landslide Hazard

Natural Areas

Applicable Precinct or Area

MSES - Regulated Vegetation (Intersecting a Watercourse)
MSES - High Ecological Value Waters (Watercourse)
MSES - Wildlife Habitat
MSES - Regulated Vegetation

More Information

- [View Section 8.2.7 Natural Areas Overlay Code](#)
- [View Section 8.2.7 Natural Areas Overlay Compliance table](#)



DMG lease

☒ Selected Property

☐ Property

MSES - Regulated Vegetation (Intersecting a Watercourse)

MSES - High Ecological Value Waters (Watercourse)

MSES - Wildlife Habitat

MSES - Regulated Vegetation

MSES - Protected Area

MSES - Marine Park

MSES - Legally Secured Offset Area

MSES - High Ecological Value Waters (Wetland)

MSES - High Ecological Significance Wetlands

Transport Pedestrian Cycle

Applicable Precinct or Area

Neighbourhood Route

More Information

- [View Section 8.2.10 Transport Network Overlay Code](#)
- [View Section 8.2.10 Transport Network Overlay Compliance table](#)



☒ Selected Property

☐ Property

Pedestrian and Cycle Network

- | | | | |
|------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------|
| — District Route | - - Future Principal Route | — Iconic Recreation Route | — Neighbourhood Route |
| — Principal Route | - - Strategic Investigation Route | — all others | |

Transport Road Hierarchy

Applicable Precinct or Area

Access Road

More Information

- [View Section 8.2.10 Transport Network Overlay Code](#)
- [View Section 8.2.10 Transport Network Overlay Compliance table](#)



☒ Selected Property

☐ Property

Road Hierarchy

— Access Road

— Arterial Road

— Collector Road

— Industrial Road

— Major Rural Road

— Minor Rural Road

— Sub Arterial Road

— Unformed Road

— all others

☐ Major Transport Corridor Buffer Area

Disclaimer

This report is not a substitute for a Planning and Development Certificate and should not be relied upon where the reliance may result in loss, damage or injury. While every effort is taken to ensure the information in this report is accurate and up to date, Douglas Shire Council makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs that may occur as a result of the report being inaccurate or incomplete in any way or for any reason.