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*)	Debell Property Pty Ltd as trustee for Debell Property Trust
Contact name *(only applicable for companies)*	Brendan Ferris
Postal address *(P.O. Box or street address)*	C/- Town Planning Alliance PO Box 7657
Suburb	East Brisbane
State	Qld
Postcode	4169
Country	Australia
Contact number	07 3361 9999
Email address *(non-mandatory)*	eda@tpalliance.com.au
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	22-0117

2) Owner's consent
2.1) Is written consent of the owner required for this development application?
☐ Yes – the written consent of the owner(s) is attached to this development application ☒ 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 (a*ll 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
	-	1299B	Mossman Daintree Road	Rocky Point
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4874	3	SP238245	Douglas Shire Council
b)	Unit No.	Street No.	Street Name and Type	Suburb
	-	1299A	Mossman Daintree Road	Rocky Point
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4874	2	SP238245	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)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

Easting(s)	Northing(s)	Zone Ref.	Datum	Local Government Area(s) *(if applicable)*
		☐ 54 ☐ 55 ☐ 56	☐ WGS84 ☐ GDA94 ☐ 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

☐ In or adjacent to a water body or watercourse or in or above an aquifer

Name of water body, watercourse or aquifer:

☐ On strategic port land under the *Transport Infrastructure Act 1994*

Lot on plan description of strategic port land:

Name of port authority for the lot:

☐ In a tidal area

Name of local government for the tidal area *(if applicable)*:

Name of port authority for tidal area *(if applicable)*:

☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*

Name of airport:

☐ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*	
EMR site identification:	
☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*	
CLR site identification:	

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)*:

Dwelling house

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)*:

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	☒ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☐ Yes – complete division 2
Operational work	☐ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

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)*
Dwelling	Dwelling house	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?

9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
☐ Subdivision *(complete 10))*	☐ Dividing land into parts by agreement *(complete 11))*
☐ Boundary realignment *(complete 12))*	☐ 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:
Number of parts created				

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?		
☐ Road work	☐ Stormwater	☐ Water infrastructure
☐ Drainage work	☐ Earthworks	☐ Sewage infrastructure
☐ Landscaping	☐ Signage	☐ Clearing vegetation
☐ Other – please specify:		

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*	
☐ Yes – specify number of new lots:	
☐ No	

14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*
$

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?
☐ 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

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).*

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
☒ Approval ☐ Development application	8/37/79(2372305)	2009	Douglas Shire Council
☐ Approval ☐ 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 Form1 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 ***Note**: See the Planning Regulation 2017 for referral requirements*	☒ Yes
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			

TownPlanning ALLIANCE

TOWN PLANNING REPORT
CODE ASSESSABLE
DEVELOPMENT APPLICATION

MATERIAL CHANGE OF USE (DEVELOPMENT PERMIT)
FOR A DWELLING HOUSE

UPON LAND AT 1299B MOSSMAN DAINTREE ROAD, ROCKY POINT
LOT 3 ON SP238245

ON BEHALF OF
DEBELL PROPERTY PTY LTD ATF DEBELL PROPERTY TRUST

OUR REFERENCE: 22-0117

PROJECT DETAILS

CLIENT:	Debell Property Pty Ltd as trustee for Debell Property Trust
PROJECT ADDRESS:	1299B Mossman Daintree Road, Rocky Point
PROJECT NUMBER:	22-0117
TPA PROJECT CONTACT:	Jessica Robson
	Brendan Ferris

TOWN PLANNING ALLIANCE CONTACT DETAILS

Brisbane
07 3361 9999
57 Manilla Street
EAST BRISBANE Q 4169

Byron Bay
02 6637 9110
Office 11, 1 Porter Street
BYRON BAY NSW 2471

Gold Coast
07 5613 2499
Office 6, 155 Varsity Parade
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DOCUMENT CONTROL

Document Control

VERSION	DATE	AUTHOR	VERSION DESCRIPTION	REVIEWED BY
1	01/07/2022	OS	Draft	BF
2	04/07/2022	OS	Final	BF

Distribution

NO OF COPIES	VERSION NO	DESTINATION
1	**2**	Town Planning Alliance Pty Ltd
1	**2**	Douglas Shire Council
1	**2**	Debell Property Pty Ltd ATF Debell Property Trust

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1 EXECUTIVE SUMMARY

This report is submitted on behalf of *Debell Property Pty Ltd as trustee for Debell Property Trust* (the applicant) in support of a Material Change of Use (Development Permit) for a Dwelling house upon land at 1299B Mossman Daintree Road, Rocky Point legally described as Lot 3 on SP238245. Lot 2 on SP238245 is also included in the application for access purposes only.

This report addresses the merits of the proposed development with respect to the provisions of the *Douglas Shire Planning Scheme 2018* and the relevant components of the *Planning Act 2016.*

Under the *Douglas Shire Planning Scheme 2018*, the site is identified as being located within the Environmental management zone, which is intended to recognise environmentally sensitive areas and provide for houses on lots and other low impact activities where suitable. The Environmental management zone code prescribes development to be generally restricted to a Dwelling house.

The proposal seeks to establish a Dwelling house upon the subject site, delivering an anticipated use in accordance with the intent of the Environmental Management Zone. The proposal seeks to deliver a two-storey product that adopts a high-quality architectural style, with significant articulation, building recesses, modulation, as well as the use of a variation of materials and finishes to present as a development with high aesthetic value. The proposal dedicates a suitable portion of the site to landscaping to soften the built form, creating a balance between the built and natural form, positively contributing to the surrounding streetscape.

The proposal is identified as being consistent with the overall outcomes of the Environmental management zone, as the development -

- *Is solely for a single residential dwelling house on a subdivided lot;*
- *The Dwelling house is strategically designed and sited to manage any potential environmental impacts on both the site and adjoining properties;*
- *Remains commensurate to pre-existing residential development in the area, with a compatible scale and design that appropriately utilises the subject allotment;*
- *The proposed design results in a high quality urban design which is functional and provide generous private open space for residential living; and*
- *Appropriately responds to site-specific constraints, and mitigates potential natural hazards.*

The proposed development provides a built form and scale that is identified as achieving the relevant assessment benchmarks applicable to the application. Overall, the proposal is identified as meeting the relevant requirements of the *Douglas Shire Planning Scheme 2018*. As such, the application should be approved subject to reasonable and relevant conditions.

2 PROJECT OVERVIEW

Applicant Name:	Debell Property Pty Ltd as trustee for Debell Property Trust				
Site Address:	1299B Mossman Daintree Road, Rocky Point				
RPD:	Lot 3 on SP238245 & Lot 2 on SP238245 for access purposes				
Area of Site:	3042m^2				
Local Government Area:	Douglas Shire Council				
Zone	Environmental Management				
Precinct	N/A				
Overlays:	Acid sulfate soils overlay Bushfire hazard overlay Hillslopes overlay Natural areas overlay Potential landslide hazard overlay Transport network overlay				
Existing Use	Vacant				
Details of Proposal:	**Material Change of Use**				
	Gross floor area	N/A	**Site cover**	7.1%	
	Building height	8.3m	**No. of storeys**	2 storeys	
	Number of units	N/A	**Car parks**	2 spaces	
	Reconfiguration of Lots				
	Existing Lots	N/A	**New Lots**	N/A	
Application Type:	**Aspects of Development**	**Type of Approval Requested**			
		Preliminary Approval	**Development Permit**		
	Material Change of Use		✓		
	Reconfiguration of a Lot				
	Building Work				
	Operational Work				
Level of Assessment:	Code Assessable	**Pre-Lodgement Advice**	N/A		
Public Notification:	No				
Referral Agencies:	**Agency**	**Concurrence/ Advice**			
	N/A	N/A			
Specialist Plans & Reports Provided:	Proposal Plans prepared by *Office Deicke*; Geotechnical Report by *Douglas Partners;* Onsite Sewerage Management Report by *Acor Consultants* Water Pressure Evaluation Report by *Acor Consultants* Bushfire Report by *Litoria*				
Applicant Contact:	Brendan Ferris / Jessica Robson				
Applicant Email:	eda@tpalliance.com.au				

3 BACKGROUND & SITE CHARACTERISTICS

3.1 Site Details

Site address:	1299B Mossman Daintree Road, Rocky Point
RPD:	Lot 3 on SP238245 & Lot 2 on SP238245 for access purposes
Site area:	3,042m^2

Figure 1: *1299B Mossman Daintree Road, Rocky Point*

3.2 Site History

As shown in Figure 1 (above), the subject site is currently vacant and is not improved by any built structures. A sealed road exists to the end of the battle-axe handle.

The subject site is a result of a residential subdivision in 2009 (Council Ref: 8/37/79(2372305)) which created 3 residential allotments and an access easement. An excerpt of the approved subdivision plan is provided further below.

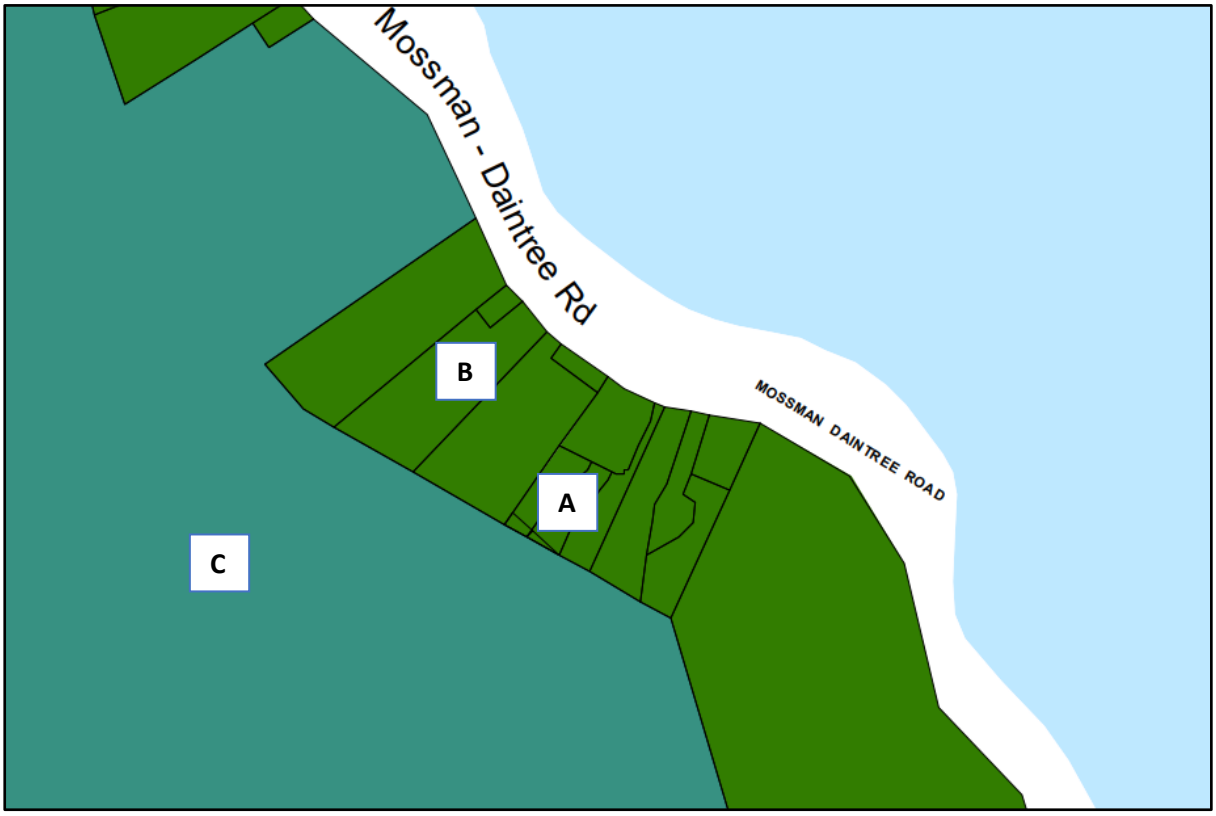
The applicant seeks to establish a Dwelling house on each of the 3 allotments, however this application is limited to Lot 2 from the resultant subdivision.

It is noted that the subject development application also includes Lot 2 SP238245 for access purposes only given the subject site requires access through Lot 2 to obtain access to Mossman Daintree Road.

Figure 2: *Excerpt of approved subdivision plan*

3.3 Location

The subject site is located at 1299B Mossman Daintree Road, Rocky Point, formally described as Lot 3 on SP238245. In accordance with *Douglas Shire Planning Scheme 2018*, the subject site is identified within the Environmental management zone. The surrounding area is also primarily identified within the Environmental management zone and Conservation zone.



A Subject Site
B Environmental zone
C Conservation zone

Figure 3: *Surrounding Zoning*

3.4 Site Characteristics

The subject site represents a rear allotment, 3,042m^2 in area currently vacant and not encumbered by existing structures. The site will obtain access to Mossman Daintree Road via a sealed road to the end of the battle-axe handle and access easment over Lot 2 on SP238245.

Topography
The subject site possesses a significant change in level from the proposed house pad towards the rear of the site at 118m AHD to 93m at the front.

Flooding
Douglas Shire Council Planning Scheme 2018 indicates the subject site is not susceptible to a flood hazard from any source.

Vegetation
The subject site is devoid of any significant vegetation. It is further noted the Dwelling house will be situated within an existing house pad to minimise the amount of site works required to reduce the impacts on the surrounding vegetation.

3.5 Pre-Lodgement History

A Prelodgement meeting was not undertaken for the proposed development.

4 PROPOSAL

The report is submitted in support of the proposed development for a new Dwelling house in the Environmental management zone.

4.1 Proposed Design

The design of the new Dwelling house has extensively considered the character of the surrounding area through architectural form and material selection. The proposal involves the following design features:

Ground Floor		
• Double car garage	• 2 x Bedrooms	• Laundry
• Living room	• Swimming pool	• Outdoor courtyard
Second Floor		
• Living / dining	• Study	• Kitchen
• Upper level balcony	• Master bedroom w/ Ensuite	

The proposed dwelling is accessed via an access handle and crossover onto Mossman Daintree Road. The location of the proposed car accommodation is designed to allow for safe and efficient vehicle manoeuvring within the site and will be consistent with Council standards.

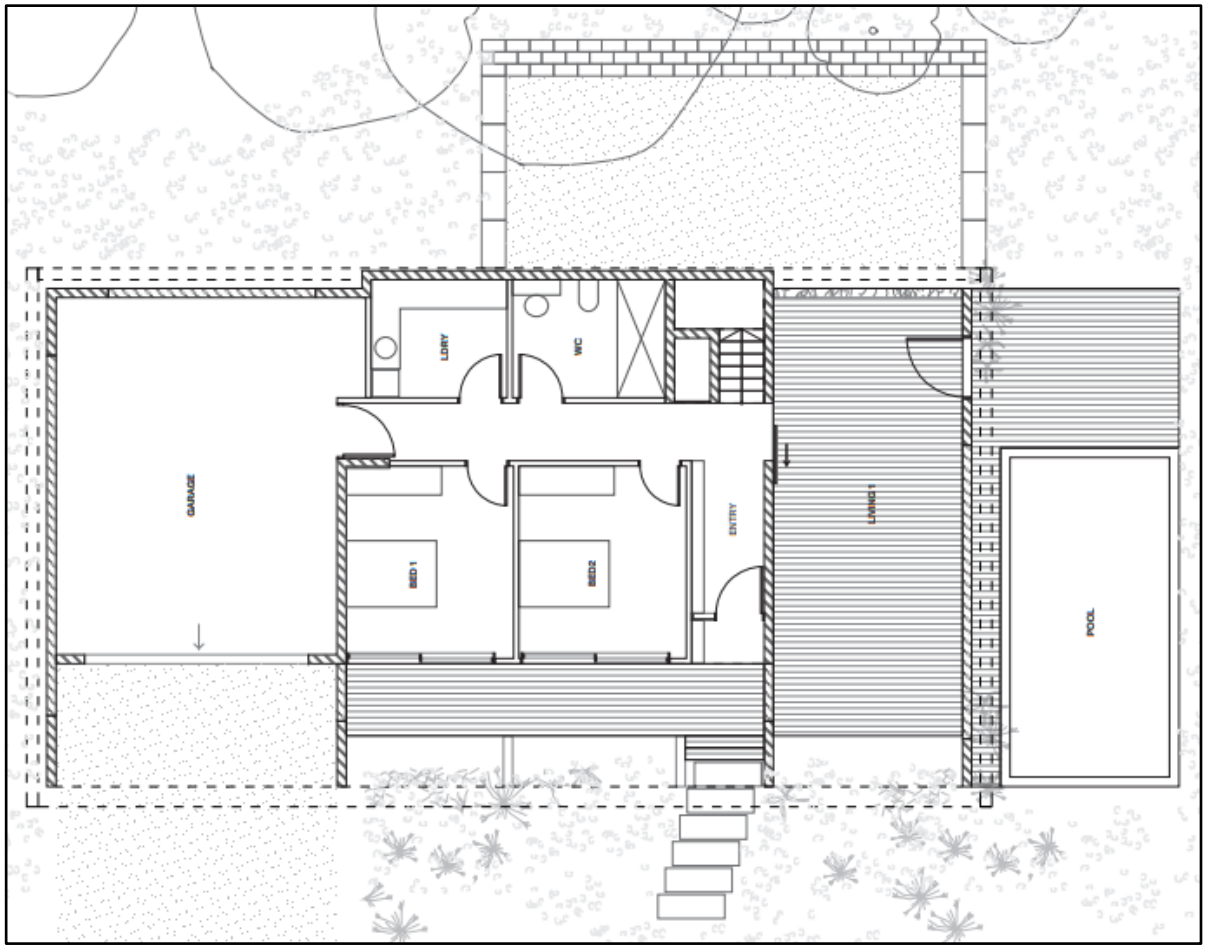


Figure 4: *Ground Floor*

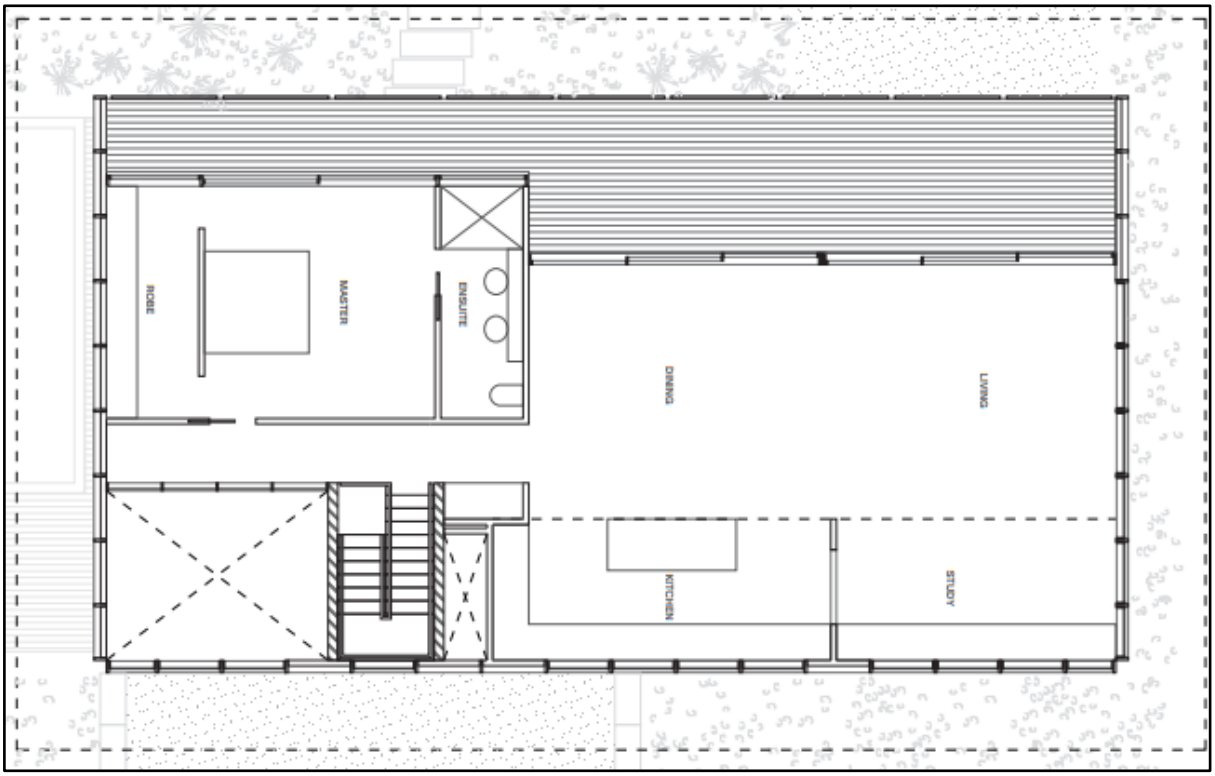


Figure 5: *Second Floor*

4.2 Building Envelope

The proposed design results in a maximum building height that is maintained under 8.5m and two (2) storeys in accordance with the Environmental management zone code. To this end, the proposed building height complies with the acceptable outcome of the *Douglas Shire Planning Scheme 2018*.

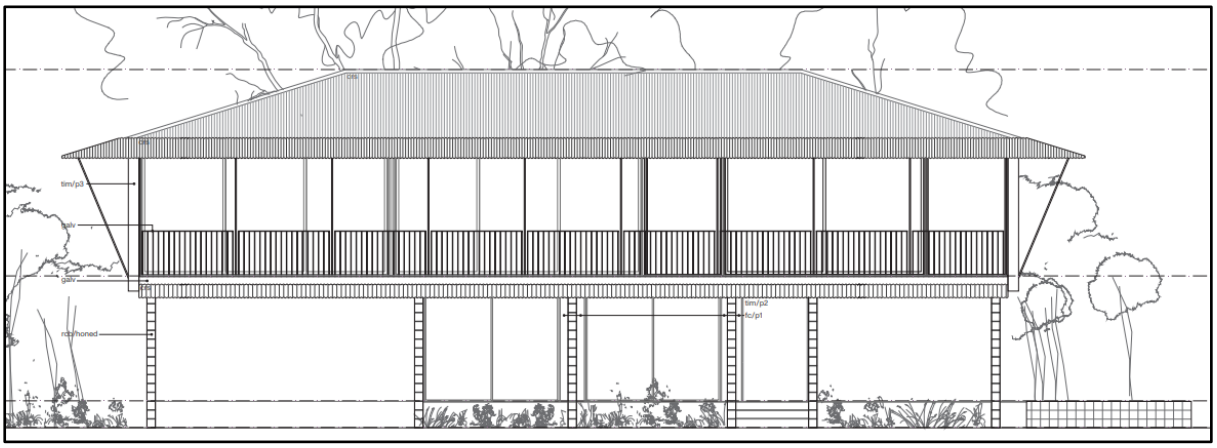


Figure 6: *Side Elevation*

In addition to the above, the proposed Dwelling house is strategically designed and located within the existing house pad which is centred in the lot and appropriately sited to provide generous setbacks to all boundaries. The proposed building envelope is well-located away from the property boundary and achieves the relevant setback provisions applicable under the assessment benchmarks.

4.3 Car Parking and Access

Access to the development will be provided via the access handle and crossover from Mossman Daintree Road from the previous subdivision. It is noted that the subject development application also includes Lot 2 SP238245 for access purposes only given the subject site requires access through Lot 2 to obtain access to Mossman Daintree Road.

The driveway arrangement is suitable for access and will allow for the necessary spacing for internal manoeuvring for residents of the site. The development seeks to provide two (2) private car parking spaces in the form of a double garage. As such, the proposal provides sufficient car parking in accordance with the provisions identified under the assessment benchmarks.

4.4 Natural Areas Overlay & Bushfire Hazard Overlay

Given the site's significance within the Environmental management zone, the subject site is also encumbered by the Natural areas overlay and Bushfire hazard overlay as illustrated below in Figures 7 & 8. Notwithstanding, the proposed Dwelling house has been designed to ensure the siting and built form results in minimal impacts on the existing vegetation. The proposal will be wholly contained within the existing house pad from the previous subdivision and will not result in the removal of significant vegetation. With regards to the bushfire provisions, the Dwelling house is appropriately separated from the bushfire hazard and will utilize fitting materials to minimise any further potential risk. Please refer to the Bushfire report prepared by *Litoria* for further details.

Figure 7 *– Natural areas overlay*

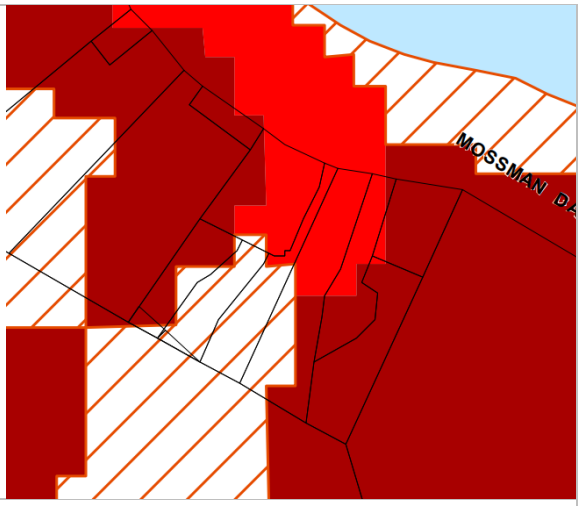


Figure 8 *– Bushfire hazard overlay*

4.5 Potential Landslide Hazard Overlay & Hillslopes Overlay

In accordance with the *Douglas Shire Planning Scheme 2018*, the subject site is impacted by the Potential landslide hazard overlay and Hillslopes overlay as illustrated below in Figure 9 & 10. As such, the proposed dwelling house has been designed in accordance with consultant supporting documentation to ensure any landslide risk is appropriately mitigated and not result in further adverse impacts on the subject site and adjoining properties. Please refer to the Geotechnical report prepared by *Douglas Partners*.

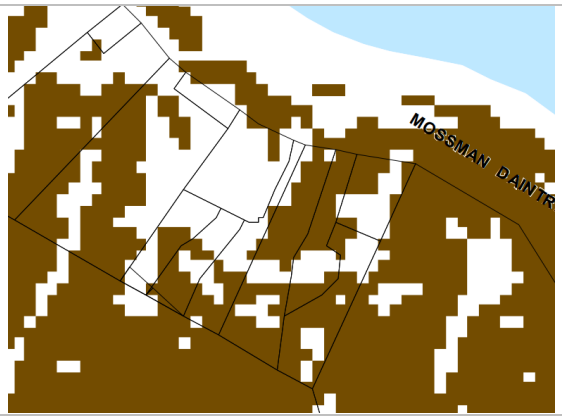


Figure 9 *– Potential landslide hazard overlay*

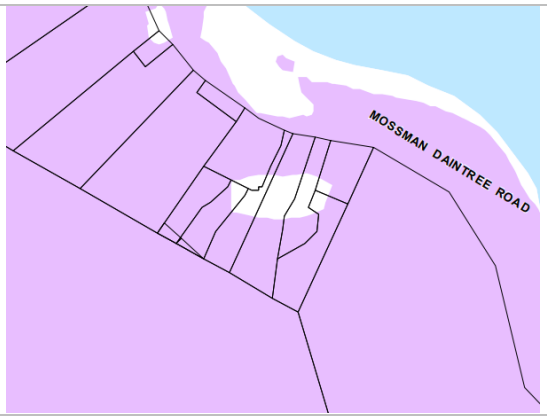


Figure 10 *– Hillslopes Overlay*

4.6 Infrastructure Services

The subject site is located within a rural setting and does not have direct access to reticulated sewer. Notwithstanding, the proposed Dwelling house will be supported by an onsite effluent system to service the dwelling house. Please refer to the Onsite sewerage management report prepared by *Acor Consultants*.

Similarly due to the rural setting, the subject site also has limited access to reticulated water. Notwithstanding, a suitable solution is proposed as demonstrated in the Water Pressure Evaluation Report prepared by *Acor Consultants* to ensure the Dwelling house can be appropriately serviced with water supply.

Overall, the proposal is identified as meeting the relevant requirements of the *Douglas Shire Planning Scheme 2018*. As such, the application should be approved subject to reasonable and relevant conditions.

5 STATE PLANNING FRAMEWORK

5.1 Planning Act 2016 – Framework

The *Planning Act 2016* provides the statutory planning framework for the State of Queensland and outlines the statutory process for preparing, assessing and deciding development applications. This proposal will be assessed in accordance with the relevant components of the *Planning Act 2016.*

The proposal will be assessed in accordance with the Development Assessment Rules under section 68(1) of the *Planning Act 2016.*

5.2 State Planning Policies

A new State Planning Policy was introduced on 3 July 2017, expressing the state's interests in land use planning and development. The new State Planning Policy has replaced the existing State Planning Policy 2006.

Part E of the State Planning Policy outlines the State interest policies and assessment benchmarks. These policies and assessment benchmarks are applicable to the assessment of development applications to the extent that the new State Planning Policy has not been identified in a Planning Scheme as being appropriately integrated.

The new State Planning Policy is identified in the *Douglas Shire Planning Scheme* 2018 as being appropriately integrated. As such, an assessment of the State interest policies is not required in this instance.

5.3 Referral Agency

As of 3 July 2017, the Department of State Development, Infrastructure and Planning launched the State Assessment and Referral Agency (SARA). In accordance with the *Planning Act 2016*, a Referral Agency is responsible for the assessment of development applications.

It is acknowledged that the subject site adjoins a State transport corridor, however given the Dwelling house does not require a new or changed access to the State transport corridor as thus is considered to be an excluded material change of use, as defined by Schedule 24 of the *Planning Regulation 2017*.

As such, in accordance with the *Planning Regulation 2017*, the application does not trigger any referrals.

5.4 State Development Assessment Provisions

The State Development Assessment Provisions came into effect on 01 July 2013 and set out matters of interest to the State for development assessment where the State has justification as an assessment manager or referral agency. The State Development Assessment Provisions Versions 2.0 came into effect on 3 July 2017.

The State Assessment and Referral Agency is not triggered as the assessment manager or a referral agency for this application under the *Planning Regulation 2017.* As such, the State Development Assessment Provisions are not applicable to the proposal.

5.5 Far North Queensland Regional Plan 2009-2031

As outlined in part 2.2 of the *Douglas Shire Planning Scheme 2018*, the planning scheme appropriately advances the *Far North Queensland Regional Plan 2009-2031*, as it applies in the planning scheme area.

Given the proposal is generally consistent with the provisions of the planning scheme, no further action is required in addressing the regional plan.

6 LOCAL PLANNING FRAMEWORK

6.1 Definition

The *Douglas Shire Planning Scheme 2018* defines a Dwelling house as follows:

> *"A residential use of premises for one household that contains a single dwelling. The use includes domestic outbuildings and works normally associated with a dwelling and may include a secondary dwelling."*

In view of the above, the proposal is consistent with the definition of a Dwelling house.

6.2 Level of Assessment

Under the *Douglas Shire Planning Scheme 2018*, the site is located within the Environmental management zone. In addition, the site is subject to the following Overlays:

- Acid sulfate soils overlay;
- Bushfire hazard overlay;
- Hillslopes overly;
- Natural areas overlay;
- Potential landslide hazard overlay;
- Transport network overlay.

In accordance with Part 5 of the *Douglas Shire Planning Scheme 2018*, the application is subject to Code Assessment on the following basis:

LEVEL OF ASSESSMENT	
ZONE	
ENVIRONMENTAL MANAGEMENT ZONE	
Code Assessable	In accordance with Table 5.6.D – Levels of Assessment for Environmental management zone, a new Dwelling house is Code Assessable and subject to the assessment of various codes. As such, the application is code assessable and the Environmental management zone code and associated codes are addressed as part of this application.
OVERLAYS	
No change	The applicable overlays mentioned above do not vary the level of assessment for the proposed Dwelling house.

In light of the above, the prevailing level of assessment for the application is **Code Assessable.**

6.3 Applicable Codes and Provisions

In accordance with Part 5 of the *Douglas Shire Planning Scheme 2018*, the following codes are identified as being applicable to the proposal:

APPLICABLE CODES	
Zone Codes	Environmental management zone code
Use Codes	Dwelling house code
Secondary Codes	Access, parking and servicing code Filling and excavation code Infrastructure code Vegetation management code
Overlay Codes	Acid sulfate soils overlay code Bushfire hazard overlay code Hillslopes overlay code Natural areas overlay code Potential landslide hazard overlay code

The abovementioned applicable Codes have been addressed in **Appendix 1** and the attached consultant reports.

7 CONCLUSION

This report is submitted on behalf of *Debell Property Pty Ltd as trustee for Debell Property Trust* (the applicant) in support of a Material Change of Use (Development Permit) for a Dwelling house upon land at 1299B Mossman Daintree Road, Rocky Point legally described as Lot 3 on SP238245. . Lot 2 on SP238245 is also included in the application for access purposes only.

This report has addressed the merits of the proposed development with respect to the provisions of the *Douglas Shire Planning Scheme 2018* and the relevant components of the *Planning Act 2016.*

The proposal seeks to establish a Dwelling house upon the subject site, delivering an anticipated use in accordance with the intent of the Environmental Management Zone. The proposal seeks to deliver a two-storey product that adopts a high-quality architectural style, with significant articulation, building recesses, modulation, as well as the use of a variation of materials and finishes to present as a development with high aesthetic value. The proposal dedicates a suitable portion of the site to landscaping to soften the built form, creating a balance between the built and natural form, positively contributing to the surrounding streetscape.

Overall, the proposal is identified as meeting the relevant requirements of the *Douglas Shire Planning Scheme 2018*. As such, the application should be approved subject to reasonable and relevant conditions.

8 APPENDIX 1 – CODE ASSESSMENT

APPENDIX 1 – CODE ASSESSMENT

TABLE OF CONTENTS

1 Zone Codes

1.1 Environmental Management Zone Code

1.1.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Environmental management zone code is to recognise environmentally sensitive areas and provide for houses on lots and other low impact activities where suitable. These areas are protected from intrusion of any urban, suburban, centre or industrial land use.		
2) The local government purpose of the code is to: a) implement the policy direction set in the Strategic Framework, in particular: (i) Theme 2 : Environment and landscape values, Element 3.5.3 – Biodiversity, Element 3.5.5 – Scenic amenity. b) protect and buffer areas of environmental significance from inappropriate development.		
3) The purpose of the code will be achieved through the following overall outcomes:		
a) Development is generally restricted to a dwelling house; b) Adverse impacts on natural systems, both on-site and on adjoining land are minimised through the location, design and management of development; c) Development reflects and responds to the natural features and environmental values of the area; d) Visual impacts are minimised through the location and design of development; e) Development does not adversely affect water quality; f) Development responds to land constraints, including but not limited to topography, vegetation, bushfire, landslide and flooding.	a) The proposal is for a new Dwelling house within an approved subdivision; b) The proposal has been designed to ensure the Dwelling house does not adversely impact upon the site and adjoining land; c) The proposal appropriately responds to the natural features and environmental values of the area; d) The proposal will not result in visual impacts; e) The dwelling house will not impact upon water quality; f) The proposed dwelling house has been designed in accordance with supporting consultant documentation to ensure compliance is achieved against the land constraints.	☒Compliant ☐N/A ☐Performance Solution

1.1.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
For assessable development			
PO1 The height of all buildings and structures is in keeping with the natural characteristics of the site. Buildings and structures are low-rise and not unduly visible from external sites.	**AO1.1** Buildings and structures are not more than 8.5 metres and two storeys in height.	**AO1.1** The proposal achieves a building height no greater than 8.5m and 2 storeys.	☒Compliant ☐N/A ☐Performance Solution
	AO1.2 Buildings have a roof height not less than 2 metres.	**AO1.2** The proposal does not have a roof height less than 2m.	☒Compliant ☐N/A ☐Performance Solution
PO2 Buildings and structures are set back to: a) maintain the natural character of the area; b) achieve separation from neighbouring buildings and from road frontages.	**AO2** Buildings and structures are set back not less than: a) 40 metres from the frontage of a state controlled road; b) 25 metres from the frontage to Cape Tribulation Road; c) 6 metres from any other road; d) 6 metres from the side and rear boundaries of the site.	**AO2** The subject site is appropriately setback from the street frontage meeting the acceptable outcome.	☒Compliant ☐N/A ☐Performance Solution
PO3 Development is consistent with the purpose of the Environmental management zone and protects the zone from the intrusion of inconsistent uses.	**AO3** Inconsistent uses as identified in Table 6.2.4.3.b are not established in the Environmental management zone.	**AO3** The proposal is for a dwelling house which is identified as a consistent use within the Environmental management zone.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
PO4 The site coverage of all buildings and structures and associated services do not have an adverse effect on the environmental or scenic values of the site.	**PO4** No acceptable outcomes are prescribed.	**AO4** The proposal generates a site cover of approximately 7% which will not have an adverse impact on the scenic values of the site.	☒Compliant ☐N/A ☐Performance Solution
PO5 Development is located, designed, operated and managed to respond to the characteristics, features and constraints of the site and its surrounds.	**AO5.1** Buildings, structures and associated access, infrastructure and private open space are sited: a) within areas of the site which are already cleared; or b) within areas of the site which are environmentally degraded; c) to minimise additional vegetation clearing.	**AO5.1** The proposed siting of the dwelling house is located within generally clear areas of the site along the house pad.	☒Compliant ☐N/A ☐Performance Solution
	AO5.2 Buildings and structures and associated infrastructure are not located on slopes greater than 1 in 6 (16.6%) or on a ridgeline.	**AO5.2** The proposed dwelling is not located on a slope that is greater than 1 in 6.	☒Compliant ☐N/A ☐Performance Solution
PO6 Buildings and structures are responsive to steep slope through innovative construction techniques so as to: a) maintain the geotechnical stability of slopes;	**AO6.1** Where development on land steeper than 1 in 6 (16.6%) cannot be avoided, development follows the natural contours of the land and single plane concrete slab on-ground methods of construction are not utilised.	**AO6.1** The proposed dwelling house is located on a house pad that is not steeper than 1 in 6.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
b) minimise cut and/or fill; c) minimise the overall height of development.	**AO6.2** Access and vehicle manoeuvring and parking areas are constructed and maintained to: a) minimise erosion; b) minimise cut and fill; follow the natural contours of the site.	**AO6.2** Access to the site will be granted in accordance with the approved subdivision via the access handle.	☒Compliant ☐N/A ☐Performance Solution
PO7 The exterior finishes of buildings and structures are consistent with the surrounding natural environment.	**PO7** The exterior finishes and colours of buildings and structures are non-reflective and are moderately dark to darker shades of grey, green, blue and brown or the development is not visible external to the site.	**AO7** The exterior finishes of the building will be consistent with the surrounding natural environment.	☒Compliant ☐N/A ☐Performance Solution
PO8 Development does not adversely affect the amenity of the zone and adjoining land uses in terms of traffic, noise, dust, odour, lighting or other physical or environmental impacts.	**AO8** No acceptable outcomes are prescribed.	**AO8** The proposal does not adversely impact the amenity of the zone and adjoining land uses.	☒Compliant ☐N/A ☐Performance Solution
PO9 The density of development ensures that the environmental and scenic amenity values of the site and surrounding area are not adversely affected.	**AO9** The maximum residential density is one dwelling house per lot.	**AO9** The proposal is limited to one dwelling house per lot.	☒Compliant ☐N/A ☐Performance Solution
PO10 Lot reconfiguration results in no additional lots.	**AO10** No acceptable outcomes are prescribed.	**AO10** The proposal is not for a reconfiguring a lot.	☐Compliant ☒N/A

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
			☐Performance Solution

2 Use / Development Codes

2.1 Dwelling House Code

2.1.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Dwelling house code is to assess the suitability of development to which this code applies.		
2) The purpose of the code will be achieved through the following overall outcomes:		
a) The dwelling house, including all habitable buildings on site, is occupied by a single household; b) A dwelling house, including a secondary dwelling or domestic out-buildings; ensures that the secondary dwelling is sub-ordinate to the primary dwelling house; c) Development of a dwelling house provides sufficient and safe vehicle access and parking for residents; d) The built form, siting, design and use of each dwelling is consistent with the desired neighbourhood character and streetscape elements of the area	a) The proposed dwelling house will be occupied by a single household. b) The proposal is limited to a single dwelling house and does not propose a secondary dwelling. c) The proposal provides safe and sufficient vehicle access for the parking of residents. d) The dwelling house is designed and sited to be consistent with the character and outcomes sought in the Environmental management zone.	☒Compliant ☐N/A ☐Performance Solution

2.1.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
For self-assessable and assessable development			
PO1 Secondary dwellings: a) are subordinate, small-scaled dwellings; b) contribute to a safe and pleasant living environment; c) are established on appropriate sized lots; d) do not cause adverse impacts on adjoining properties.	**AO1** The secondary dwelling: a) has a total gross floor area of not more than 80m2, excluding a single carport or garage; b) is occupied by 1 or more members of the same household as the dwelling house.	**AO1** The proposal does not include a secondary dwelling.	☐Compliant ☒N/A ☐Performance Solution
PO2 Resident's vehicles are accommodated on- site.	**AO2** Development provides a minimum number of on- site car parking spaces comprising: a) 2 car parking spaces which may be in tandem for the dwelling house; b) 1 car parking space for any secondary dwelling on the same site.	**AO2** The dwelling house includes double car accommodate in the form of a garage.	☒Compliant ☐N/A ☐Performance Solution
PO3 Development is of a bulk and scale that: a) is consistent with and complements the built form and front boundary setbacks prevailing in the street and local area; b) does not create an overbearing development for adjoining	**AO3** Development meets the acceptable outcome for building height in the applicable Zone code associated with the site.	**AO3** The proposal achieves a compliant building height in accordance with the Environmental management zone.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
dwelling houses and their private open space; c) does not impact on the amenity and privacy of residents in adjoining dwelling houses; d) ensures that garages do not dominate the appearance of the street.			

3 Secondary Codes

3.1 Access, Parking and servicing Code

3.1.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Access, parking and servicing code is to assess the suitability of access, parking and associated servicing aspects of a development.		
2) The purpose of the code will be achieved through the following overall outcomes:		
a) sufficient vehicle parking is provided on-site to cater for all types of vehicular traffic accessing and parking on-site, including staff, guests, patrons, residents and short term delivery vehicles; b) sufficient bicycle parking and end of trip facilities are provided on-site to cater for customer and service staff; c) on-site parking is provided so as to be accessible and convenient, particularly for any short term uses; d) development provides walking and cycle routes through the site which link the development to the external walking and cycling network; e) the provision of on-site parking, loading / unloading facilities and the provision of access to the site do not impact on the efficient function of street network or on the area in which the development is located; f) new vehicular access points are safely located and are not in conflict with the preferred ultimate streetscape character and local character and do not unduly disrupt any current or future on-street parking arrangements.	a) The proposal provides sufficient parking for the proposed dwelling house; b) The proposal is for a dwelling house. As such, this element is not applicable; c) On-site car parking is provided in the form of a garage and is easily accessible to the residents; d) The proposal is for a dwelling house. As such, this element is not applicable; e) The proposal is for a dwelling house. As such, this element is not applicable; f) The proposal will utilise the access points in accordance with the previous subdivision approval.	☒Compliant ☐N/A ☐Performance Solution

3.1.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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: 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;	**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.	**AO1.1** The proposal provides on-site car parking in accordance with Table 9.4.1.3.B.	☒Compliant ☐N/A ☐Performance Solution
	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.	**AO1.2** The proposed garage will be freely available for the parking of vehicles.	☒Compliant ☐N/A ☐Performance Solution
	AO1.3 Parking for motorcycles is substituted for ordinary vehicle parking to a maximum level of 2% of total ordinary vehicle parking.	**AO1.3** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	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.	**AO1.4** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
h) whether or not the proposed use involves the retention of significant vegetation.			
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.	**AO2** Vehicle parking areas will be in accordance with the Australian standards.	☒Compliant ☐N/A ☐Performance Solution
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;	**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.	**AO3.1** Access to the site will be in accordance with the existing subdivision approval granted over the site.	☒Compliant ☐N/A ☐Performance Solution
	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	**AO3.2** Access to the site will be in accordance with the existing subdivision approval granted over the site.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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, cutting of the adjoining road reserve or any built structures (other than what may be necessary to cross over a stormwater channel).	adjacent footpath; c) adhere to minimum sight distance requirements in accordance with AS2980.1.		
	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 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.	**AO3.3** Access to the site will be in accordance with the existing subdivision approval granted over the site.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	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.	**AO3.4** Access to the site will be in accordance with the existing subdivision approval granted over the site.	☒Compliant ☐N/A ☐Performance Solution
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.	**AO4** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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	**AO5** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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.	**AO6** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
PO7 Development provides secure and convenient bicycle parking which:	**AO7.1** Development provides bicycle parking spaces for employees which are co-located with end-of-trip facilities (shower cubicles and lockers);	**AO7.1** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	**AO7.2** Development ensures that the location of visitor bicycle parking is discernible either by direct view or using signs from the street.	**AO7.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO7.3 Development provides visitor bicycle parking which does not impede pedestrian movement.	**AO7.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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; c) ensure pedestrian and cyclist safety.	**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.	**AO8** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
PO9 Access, internal circulation and on-site parking for service vehicles are designed and constructed:	**AO9.1** Access driveways, vehicle manoeuvring and on- site parking for service vehicles are designed and constructed in accordance	**AO9.1** Access to the site will be in accordance with the existing subdivision approval granted over the site.	☒Compliant ☐N/A

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	with AS2890.1 and AS2890.2.		☐Performance Solution
	AO9.2 Service and loading areas are contained fully within the site.	**AO9.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO9.3 The movement of service vehicles and service operations are designed so they: a) do not impede access to parking spaces; b) do not impede vehicle or pedestrian traffic movement.	**AO9.3** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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	**AO10.1** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	facility; g) service station.		
	AO10.2 Queuing and set-down areas are designed and constructed in accordance with AS2890.1.	**AO10.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

3.2 Infrastructure Works Code

3.2.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Infrastructure works code is to ensure that development is safely and efficiently serviced by, and connected to, infrastructure.		
2) The purpose of the Infrastructure works code is to ensure that development is safely and efficiently serviced by, and connected to, infrastructure.		
a) the standards of water supply, waste water treatment and disposal, stormwater drainage, local electricity supply, telecommunications, footpaths and road construction meet the needs of development and are safe and efficient; b) development maintains high environmental standards; c) development is located, designed, constructed and managed to avoid or minimise impacts arising from altered stormwater quality or flow, wastewater discharge, and the creation of non-tidal artificial waterways; d) the integrity of existing infrastructure is maintained;	a) The proposed dwelling house will be serviced by on-site effluent treatment as well as sufficient water supply. Please refer to the supporting consultant reports for further details; b) The proposal will maintain the high environmental standards; c) The proposed Dwelling house will not result in significant impacts on the stormwater quality or flow; d) The proposal will not impact on existing infrastructure; e) The Dwelling house does not detract from any environmental values or desired character and amenity of the area.	☒Compliant ☐N/A ☐Performance Solution

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
e) development does not detract from environmental values or the desired character and amenity of an area.		

3.2.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
For self-assessable and assessable development			
Works on a local government road			
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.	**AO1.1** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO1.2 Kerb ramp crossovers are constructed in accordance with Planning scheme policy SC 5 – FNQROC Regional Development Manual.	**AO1.2** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO1.3 New pipes, cables, conduits or other similar infrastructure required to cross existing footpaths: a) are installed via trenchless	**AO1.3** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	methods; or b) where 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 not less than a 1.2 metre section.		
	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 and existing sections; c) new sections are matched to existing in terms of dimension and reinforcement.	**AO1.4** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO1.5 Decks, verandahs, stairs, posts and other structures located in the road reserve do not restrict or impede pedestrian movement on footpaths or change the level of the road verges.	**AO1.5** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
Accessibility structures			
PO2 Development is designed to ensure it is accessible for people of all abilities and accessibility features do not	**AO2.1** Accessibility structures are not located within the road reserve.	**AO2.1** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
impact on the efficient and safe use of footpaths.	**AO2.2** Accessibility structures are designed in accordance with AS1428.3.	**AO2.2** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	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.	**AO2.3** The proposal is for a new Dwelling house on a residential lot. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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;	**AO3.1** Please refer to the Water pressure evaluation report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
	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 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	**AO3.2** Please refer to the Water pressure evaluation report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	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.		
Treatment and disposal of effluent			
PO4 Provision is made for the treatment and disposal of effluent to ensure that there are no adverse impacts on water quality and no adverse ecological impacts as a result of the system or as a result of increasing the cumulative effect of systems in the locality.	**AO4.1** The site is connected to Council's sewerage system and the extension of or connection to the sewerage system is designed and constructed in accordance with the Design Guidelines set out in Section D7 of the Planning scheme policy SC5 – FNQROC Regional Development Manual;	**AO4.1** Please refer to the onsite sewerage evaluation report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
	AO4.2 Where not in a sewerage scheme area, the proposed disposal system meets the requirements of Section 33 of the *Environmental Protection Policy (Water) 1997* and the proposed on site effluent disposal system is designed in accordance with the *Plumbing and Drainage Act (2002).*	**AO4.2** Please refer to the onsite sewerage evaluation report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
Stormwater quality			
PO5 Development is planned, designed, constructed and operated to avoid or minimise adverse impacts on stormwater quality in natural and	**AO5.1** A connection is provided from the premises to Council's drainage system;	**AO5.1** The proposed dwelling house will be connected to Council's drainage system.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
developed catchments by: a) achieving stormwater quality objectives; b) protecting water environmental values; c) maintaining waterway hydrology.	**AO5.2** An underground drainage system is constructed to convey stormwater from the premises to Council's drainage system in accordance with the Design Guidelines set out in Sections D4 and D5 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.	**AO5.2** The proposed dwelling house will be connected to Council's drainage system.	☒Compliant ☐N/A ☐Performance Solution
	AO5.3 A stormwater quality management plan is prepared, and provides for achievable stormwater quality treatment measures meeting design objectives listed in Table 9.4.5.3.b and Table 9.4.5.3.c, reflecting land use constraints, such as: a) erosive, dispersive and/or saline soil types; b) landscape features (including landform); c) acid sulfate soil and management of nutrients of concern; d) rainfall erosivity.	**AO5.3** The proposed dwelling house will be connected to Council's drainage system.	☒Compliant ☐N/A ☐Performance Solution
	AO5.4 Erosion and sediment control practices are designed, installed, constructed, monitored, maintained, and carried out in accordance with an erosion and sediment control plan.	**AO5.4** Erosion and sediment control practices will be carried out in accordance with an erosion and sediment control plan.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	AO5.5 Development incorporates stormwater flow control measures to achieve the design objectives set out in Table 9.4.5.3.b and Table 9.4.5.3.c, including management of frequent flows, peak flows, and construction phase hydrological impacts.	**AO5.5** The proposed dwelling house will be connected to Council's drainage system.	☐Compliant ☐N/A ☐Performance Solution
Non-tidal artificial waterways			
PO6 Development involving non-tidal artificial waterways is planned, designed, constructed and operated to: 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; e) achieve water quality objectives.	**AO6.1** Development involving non-tidal artificial waterways ensures: 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.	**AO6.1** The proposal does not involve non-tidal artificial waterways. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	AO6.2 Non-tidal artificial waterways are located: 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.	**AO6.2** The proposal does not involve non-tidal artificial waterways. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	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 ensures: a) there is sufficient flushing or a tidal range of b) >0.3 m; or c) any tidal flow alteration does not adversely impact on the tidal waterway; or d) there is no introduction of salt water into freshwater environments.	**AO6.3** The proposal does not involve non-tidal artificial waterways. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO6.4 Non-tidal artificial waterways are designed and managed for any of the following end-use purposes: a) amenity (including aesthetics), landscaping or recreation; or b) flood management, in accordance with	**AO6.4** The proposal does not involve non-tidal artificial waterways. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	a drainage catchment management plan; or c) stormwater harvesting plan as part of an integrated water cycle management plan; or d) aquatic habitat.		
	AO6.5 The end-use purpose of the non-tidal artificial waterway is designed and operated in a way that protects water environmental values.	**AO6.5** The proposal does not involve non-tidal artificial waterways. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO6.6 Monitoring and maintenance programs adaptively manage water quality to achieve relevant water quality objectives downstream of the waterway.	**AO6.6** The proposal does not involve non-tidal artificial waterways. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO6.7 Aquatic weeds are managed to achieve a low percentage of coverage of the water surface area, and pests and vectors are managed through design and maintenance.	**AO6.7** The proposal does not involve non-tidal artificial waterways. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
Wastewater discharge			
PO7 Discharge of wastewater to waterways, or off site:	**AO7.1** A wastewater management plan is prepared and addresses: a) wastewater type; b) climatic conditions;	**AO7.1** Please refer to the onsite sewerage evaluation report for further details.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	c) water quality objectives; d) best practice environmental management.		
	AO7.2 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.	**AO7.2** Please refer to the onsite sewerage evaluation report for further details.	☒Compliant ☐N/A ☐Performance Solution
	AO7.3 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.	**AO7.3** Please refer to the onsite sewerage evaluation report for further details.	☒Compliant ☐N/A ☐Performance Solution
	AO7.4 Development in coastal catchments avoids or minimises and appropriately manages soil disturbance or altering natural hydrology and: a) avoids lowering ground water levels where potential or actual acid sulfate soils are present;	**AO7.4** Please refer to the onsite sewerage evaluation report for further details.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	b) manages wastewater so that: (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; (ii) holding times of neutralised wastewater ensures the flocculation and removal of any dissolved iron prior to release; (iii) visible iron floc is not present in any discharge; (iv) precipitated iron floc is contained and disposed of; (v) 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.		
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;	**AO8.1** The dwelling house will be connected with a power source from the electricity distribution network.	☒Compliant ☐N/A ☐Performance Solution
	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	**AO8.2** The dwelling house will be connected with a power source from the electricity distribution network.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	Regional Development Manual.		
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.	**AO9.1** A pad-mount electricity infrastructure is not proposed as part of the application.	☐Compliant ☒N/A ☐Performance Solution
	AO9.2 Pad-mount electricity infrastructure within a building, in a Town Centre is designed and located to enable an active street frontage.	**AO9.2** A pad-mount electricity infrastructure is not proposed as part of the application.	☐Compliant ☒N/A ☐Performance Solution
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.	**AO10** The dwelling house will be connected to telecommunication infrastructure.	☒Compliant ☐N/A ☐Performance Solution
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.	**AO11** The dwelling house will be connected to telecommunication infrastructure.	☒Compliant ☐N/A ☐Performance Solution
Road construction			

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	**AO12.1** Road construction is not proposed or required as part of the application.	☐Compliant ☒N/A ☐Performance Solution
	AO12.2 There is existing road, kerb and channel for the full road frontage of the site.	**AO12.2** Road construction is not proposed or required as part of the application.	☐Compliant ☒N/A ☐Performance Solution
	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.	**AO12.3** Road construction is not proposed or required as part of the application.	☐Compliant ☒N/A ☐Performance Solution
Alterations 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.	**AO13** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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;	**AO14.1** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
			☐Performance Solution
	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.	**AO14.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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.	**AO15** The proposed dwelling house will be undertaken to minimise adverse impacts on existing vegetation over the site.	☒Compliant ☐N/A ☐Performance Solution
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.	**AO16** The proposed dwelling house will be undertaken in accordance with the planning scheme policy.	☒Compliant ☐N/A ☐Performance Solution
For assessable development			

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
High speed telecommunication infrastructure			
PO17 Development provides infrastructure to facilitate the roll out of high speed telecommunications infrastructure.	**AO17** No acceptable outcomes are prescribed.	**AO17** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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.	**AO18** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
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.	**AO19.1** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	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. Above ground fire hydrants have dual-valved outlets.	**AO19.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
PO20 Hydrants are suitable identified so that fire services can locate them at all hours.	**AO20** No acceptable outcomes are prescribed.	**AO20** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

3.3 Vegetation management Code

3.3.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Vegetation management code is achieved through the overall outcomes.		
2) The purpose of the code will be achieved through the following overall outcomes:		
a) vegetation is protected from inappropriate damage; b) where vegetation damage does occur it is undertaken in a sustainable manner; c) significant trees are maintained and protected; d) biodiversity and ecological values are protected and maintained; e) habitats for rare, threatened and endemic species of flora and fauna are protected and maintained; f) landscape character and scenic amenity is protected and maintained; g) heritage values are protected and maintained.	a) The proposed dwelling house ensures vegetation is protected from inappropriate damages; b) Where vegetation damage is required, it will be undertaken in a sustainable manner; c) The proposal does not impact upon significant trees; d) The proposed dwelling house is of a built form and scale that will protect and maintain biodiversity and ecological values; e) The proposed dwelling house does not impact upon rare, threatened and endemic species of flora and fauna; f) The proposed dwelling house protects the landscape character and scenic amenity; g) The subject site is not identified to contain heritage values.	☒Compliant ☐N/A ☐Performance Solution

3.3.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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;	**AO1.1** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	AO1.2 Vegetation damage is undertaken by or on behalf of the local government on land controlled, owned or operated by the local government;	**AO1.2** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	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 Land Protection (Pest and Stock Route Management) Act 2002; or b) vegetation identified within the local govern- ment's register of declared plants pursuant to the local government's local laws; or	**AO1.3** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	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;.		
	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;	**AO1.4** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	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;	**AO1.5** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	AO1.6 Vegetation damage is in accordance with an approved Property Map of Assessable Vegetation issued under the *Vegetation Management Act 1999;*	**AO1.6** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	AO1.7 Vegetation damage is essential to the maintenance of an existing fire break;	**AO1.7** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	AO1.8 Vegetation damage is essential to prevent interference to overhead service cabling;	**AO1.8** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	AO1.9 Vegetation damage is for an approved Forest practice, where the lot is subject to a scheme approved under the *Vegetation Management Act 1999;*	**AO1.9** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	AO1.10 Vegetation damage is undertaken in accordance with section 584 of the *Sustainable Planning Act 2009.*	**AO1.10** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
		dwelling house.	
	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).	**AO1.11** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	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.	**AO1.12** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
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;	**AO2.1** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution
	AO2.2 Damaged vegetation is mulched or chipped if used onsite.	**AO2.1** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	**AO3** The proposed dwelling house requires minimal site works as it will be constructed over the existing house pad. Vegetation clearing will not be required to support the dwelling house.	☐Compliant ☒N/A ☐Performance Solution

4 Overlay Codes

4.1 Acid Sulfate Soils Overlay Code

4.1.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the acid sulfate soils overlay code is to: a) implement the policy direction in the Strategic Framework, in particular: (i) Theme 2: Environment and landscape values, Element 3.5.4 Coastal zones. (ii) Theme 3: Natural resource management, Element 3.6.2 land and catchment management, Element 3.6.3 Primary production, forestry and fisheries.		
2) enable an assessment of whether development is suitable on land within the Acid sulfate soils overlay sub-categories.		
3) The purpose of the code will be achieved through the following overall outcomes:		
a) Development ensures that the release of any acid and associated metal contaminant is avoided by not disturbing acid sulfate soils when excavating, removing soil or extracting ground water or filling land; b) Development ensures that disturbed acid sulfate soils, or drainage waters, are treated and, if required, on-going management practices are adopted that minimise the potential for environmental harm from acid sulfate soil and protect corrodible assets from acid sulfate soil.	A) The proposal will ensure any release of acid and associated metal contaminants is avoided; B) The proposal ensures any found disturbed acid sulfate soils, or drainage waters are treated to minimise environmental harm.	☒Compliant ☐N/A ☐Performance Solution

4.1.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	**AO1.1** The proposed dwelling house requires minimal site works as the house will be located on the existing house pad.	☒Compliant ☐N/A ☐Performance Solution
	AO1.2 An acid sulfate soils investigation is undertaken.	**AO1.2** The proposed dwelling house requires minimal site works as the house will be located on the existing house pad.	☒Compliant ☐N/A ☐Performance Solution
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.	**AO2.1** The proposed dwelling house requires minimal site works as the house will be located on the existing house pad.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	AO2.2 The disturbance of potential acid sulfate soils or actual acid sulfate soils is undertaken in accordance with an acid sulfate soils management plan and avoids the release of metal contaminants by: 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.	**AO2.2** The proposed dwelling house requires minimal site works as the house will be located on the existing house pad.	☒Compliant ☐N/A ☐Performance Solution
PO3 No environmental harm is caused as a result of exposure to potential acid sulfate soils or actual acid sulfate soils.	**AO3** No acceptable outcomes are prescribed.	**AO3** The proposed dwelling house requires minimal site works as the house will be located on the existing house pad.	☒Compliant ☐N/A ☐Performance Solution

4.2 Bushfire Hazard Overlay Code

4.2.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Bushfire overlay code is to: a) implement the policy direction in the Strategic Framework, in particular: (i) Theme 1 Settlement pattern: Element 3.4.7 Mitigation of hazards; (ii) Theme 6 Infrastructure and transport: Element 3.9.2 Energy. b) enable an assessment of whether development is suitable on land within the Bushfire risk overlay sub-categories.		
2) The purpose of the code will be achieved through the following overall outcomes:		
a) development avoids the establishment or intensification of vulnerable activities within or near areas that are subject to bushfire hazard; b) development is designed and located to minimise risks to people and property from bushfires; c) bushfire risk mitigation treatments are accommodated in a manner that avoids or minimises impacts on the natural environment and ecological processes; d) development involving the manufacture or storage of hazardous materials does not increase the risk to public safety or the environment in a bushfire event; e) development contributes to effective and efficient disaster management response and recovery capabilities.	a) The proposed dwelling house has been designed to avoid areas that are subject to bushfire hazard; b) The proposal strategically located to minimise the threat of bushfire; c) The development will incorporate bushfire risk mitigation treatments; d) The development does not involve the manufacture or storage of hazardous materials; e) The proposal will ensure the dwelling house has an effective and efficient disaster management response capability.	☒Compliant ☐N/A ☐Performance Solution

4.2.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
For self-assessable and assessable development			
Compatible development			
PO1 A vulnerable use is not established or materially intensified within a bushfire hazard area (bushfire prone area) unless there is an overriding need or other exceptional circumstances.	**AO1** Vulnerable uses are not established or expanded	**AO1** The proposed dwelling house is appropriately located to manage the bushfire risk applicable over the site. Please refer to the bushfire report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
PO2 Emergency services and uses providing community support services are able to function effectively during and immediately after a bushfire hazard event.	**AO2** Emergency Services and uses providing community support services are not located in a bushfire hazard sub-category and have direct access to low hazard evacuation routes.	**AO2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
PO3 Development involving hazardous materials manufactured or stored in bulk is not located in bushfire hazard sub-category.	**AO3** The manufacture or storage of hazardous material in bulk does not occur within bushfire hazard sub-category.	**AO3** The proposal does not involve the manufacture or storage of hazardous materials.	☐Compliant ☒N/A ☐Performance Solution
Development design and separation from bushfire hazard – reconfiguration of lots			
PO4.1 Where reconfiguration is undertaken in an urban area or is for urban purposes or smaller scale rural residential purposes, a separation distance from hazardous vegetation is provided to	**AO4.1** No new lots are created within a bushfire hazard sub-category.	**AO4.1** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
achieve a radiant heat flux level of 29kW/m^2 at the edge of the proposed lot(s).			
PO4.2 Where reconfiguration is undertaken for other purposes, a building envelope of reasonable dimensions is provided on each lot which achieves radiant heat flux level of 29kW/m2 at any point.	**AO4.2** Lots are separated from hazardous vegetation by a distance that: a) achieves radiant heat flux level of 29kW/m^2 at all boundaries; and b) is contained wholly within the development site.	**AO4.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
PO5 Where reconfiguration is undertaken in an urban area or is for urban purposes, a constructed perimeter road with reticulated water supply is established between the lots and the hazardous vegetation and is readily accessible at all times for urban fire fighting vehicles. The access is available for both fire fighting and maintenance/defensive works.	**AO5.1** Lot boundaries are separated from hazardous vegetation by a public road which: a) has a two lane sealed carriageway; b) contains a reticulated water supply; c) is connected to other public roads at both ends and at intervals of no more than 500m; d) accommodates geometry and turning radii in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; e) has a minimum of 4.8m vertical clearance above the road; f) is designed to ensure hydrants and water access points are not located within parking bay allocations; and **g)** incorporates roll-over kerbing.	**AO5.1** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	AO5.2 Fire hydrants are designed and installed in accordance with AS2419.1 2005, unless otherwise specified by the relevant water entity.	**AO5.2** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
PO6 Where reconfiguration is undertaken for smaller scale rural residential purposes, either a constructed perimeter road or a formed, all weather fire trail is established between the lots and the hazardous vegetation and is readily accessible at all times for the type of fire fighting vehicles servicing the area. The access is available for both fire fighting and maintenance/hazard reduction works.	**AO6** Lot boundaries are separated from hazardous vegetation by a public road or fire trail which has: a) a reserve or easement width of at least 20m; b) a minimum trafficable (cleared and formed) width of 4m capable of accommodating a 15 tonne vehicle and which is at least 6m clear of vegetation; c) no cut or fill embankments or retaining walls adjacent to the 4m wide trafficable path; d) a minimum of 4.8m vertical clearance; e) turning areas for fire-fighting appliances in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; f) a maximum gradient of 12.5%; g) a cross fall of no greater than 10 degrees; h) drainage and erosion control devices in accordance with the standards prescribed in a planning scheme policy; i) vehicular access at each end which is	**AO6** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	connected to the public road network at intervals of no more than 500m; j) designated fire trail signage; k) if used, has gates locked with a system authorised by Queensland Fire and Emergency Services; and l) if a fire trail, has an access easement that is granted in favour of Council and Queensland Fire and Emergency Services.		
PO7 Where reconfiguration is undertaken for other purposes, a formed, all weather fire trail is provided between the hazardous vegetation and either the lot boundary or building envelope, and is readily accessible at all times for the type of fire fighting vehicles servicing the area. However, a fire trail will not be required where it would not serve a practical fire management purpose.	**AO7** Lot boundaries are separated from hazardous vegetation by a public road or fire trail which has: a) a reserve or easement width of at least 20m; b) a minimum trafficable (cleared and formed) width of 4m capable of accommodating a 15 tonne vehicle and which is at least 6m clear of vegetation; c) no cut or fill embankments or retaining walls adjacent to the 4m wide trafficable path; d) a minimum of 4.8m vertical clearance; e) turning areas for fire-fighting appliances in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; f) a maximum gradient of 12.5%; g) a cross fall of no greater than 10	**AO7** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	degrees; h) drainage and erosion control devices in accordance with the standards prescribed in a planning scheme policy; i) vehicular access at each end which is connected to the public road network; j) designated fire trail signage; k) if used, has gates locked with a system authorised by Queensland Fire and Emergency Services; and l) if a fire trail, has an access easement that is granted in favour of Council and Queensland Fire and Emergency Services.		
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 d) /evacuation area in the event of an approaching bushfire; and e) ensures roads likely to be used in the event of a fire are designed to minimise traffic congestion.	**AO8** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
PO9 Critical infrastructure does not increase the potential bushfire hazard.	**AO9** Critical or potentially hazardous infrastructure such as water supply, electricity, gas and telecommunications are placed underground.	**AO9** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
Development design and separation from bushfire hazard – material change of use			
PO10 Development is located and designed to ensure proposed buildings or building envelopes achieve a radiant heat flux level at any point on the building or envelope respectively, of: a) 10kW/m^2 where involving a vulnerable use; or b) 29kW/m^2 otherwise. The radiant heat flux level is achieved by separation unless this is not practically achievable.	**AO10** Buildings or building envelopes are separated from hazardous vegetation by a distance that: a) achieves a radiant heat flux level of at any point on the building or envelope respectively, of 10kW/m^2 for a vulnerable use or 29kW/m^2 b) otherwise; and c) is contained wholly within the development site.	**AO10** The proposed dwelling house is appropriately located and separated from the bushfire risk. Please refer to the bushfire report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
PO11 A formed, all weather fire trail is provided between the hazardous vegetation and the site boundary or building envelope, and is readily accessible at all times for the type of fire fighting vehicles servicing the area. However, a fire trail will not be required where it would not serve a	**AO11** Development sites are separated from hazardous vegetation by a public road or fire trail which has: a) a reserve or easement width of at least 20m; b) a minimum trafficable (cleared and formed) width of 4m capable of accommodating a 15 tonne vehicle and which is at least 6m clear of vegetation;	**AO11** The proposed dwelling house is appropriately located and separated from the bushfire risk. Please refer to the bushfire report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
practical fire management purpose.	c) no cut or fill embankments or retaining walls adjacent to the 4m wide trafficable path; d) a minimum of 4.8m vertical clearance; e) turning areas for fire-fighting appliances in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; f) a maximum gradient of 12.5%; g) a cross fall of no greater than 10 degrees; h) drainage and erosion control devices in accordance with the standards prescribed in a planning scheme policy; i) vehicular access at each end which is connected to the public road network which is connected to the public road network at intervals of no more than 500m; j) designated fire trail signage; k) if used, has gates locked with a system authorised by Queensland Fire and Emergency Services; and l) if a fire trail, has an access easement that is granted in favour of Council and Queensland Fire and Emergency Services.		
All Development			
PO12	**AO12**	**AO12**	

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
All premises are provided with vehicular access that enables safe evacuation for occupants and easy access by fire fighting appliances.	Private driveways: a) do not exceed a length of 60m from the street to the building; b) do not exceed a gradient of 12.5%; c) have a minimum width of 3.5m; d) have a minimum of 4.8m vertical clearance; e) accommodate turning areas for fire-fighting appliances in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; and f) serve no more than 3 dwellings or buildings.	The proposed dwelling house is appropriately located and separated from the bushfire risk. Please refer to the bushfire report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
PO13 Development outside reticulated water supply areas includes a dedicated static supply that is available solely for fire fighting purposes and can be accessed by fire fighting appliances.	**AO13** A water tank is provided within 10m of each building (other than a class 10 building) which: a) is either below ground level or of non-flammable construction; b) has a take off connection at a level that allows the following dedicated, static water supply to be left available for access by fire fighters: i. 10,000l for residential buildings ii. 45,000l for industrial buildings; and iii. 20,000l for other buildings; c) includes shielding of tanks and pumps in accordance with the relevant standards; d) includes a hardstand area allowing	**AO13** The proposed dwelling house is appropriately located and separated from the bushfire risk. Please refer to the bushfire report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	medium rigid vehicle (15 tonne fire appliance) access within 6m of the tank; e) is provided with fire brigade tank fittings – 50mm ball valve and male camlock coupling and, if underground, an access hole of 200mm (minimum) to accommodate suction lines; and f) is clearly identified by directional signage provided at the street frontage.		
PO14 Landscaping does not increase the potential bushfire risk.	**AO14** Landscaping uses species that are less likely to exacerbate a bushfire event, and does not increase fuel loads within separation areas.	**AO14** The proposed dwelling house is appropriately located and separated from the bushfire risk. Please refer to the bushfire report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
PO15 The risk of bushfire and the need to mitigate that risk is balanced against other factors (such as but not limited to, biodiversity or scenic amenity).	**AO15** Bushfire risk mitigation treatments do not have a significant impact on the natural environment or landscape character of the locality where this has value.	**AO15** The proposed dwelling house is appropriately located and separated from the bushfire risk. Please refer to the bushfire report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution

4.3 Hillslopes Overlay Code

4.3.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Hillslopes overlay code is to: a) implement the policy direction in the Strategic Framework, in particular: (i) Theme 1 - Settlement pattern: Element 3.4.7 Mitigation of hazards; (ii) Theme 2 – Environment and landscape values: Element 3.5.5 Scenic amenity. b) enable an assessment of whether development is suitable on land within the Hillslopes sub-categories.		
2) The purpose of the code will be achieved through the following overall outcomes:		
a) development on hillslopes is safe, serviceable and accessible; b) the ecological values, landscape character and visual quality of the hillslopes are protected from development so as to retain the scenic backdrop to the region; c) Development on hillslopes is appropriate, having regard to the topographic constraints and environmental characteristics of the land; d) Development responds to the constraints of the site including gradient and slope stability; e) Works do not involve complex engineering solutions.	f) The proposal is for a new dwelling house on an approved subdivision over the site. g) The proposal does not adversely impact upon the ecological values of the site. h) The proposed dwelling house is located on a house pad which is appropriate with regards to topographic constraints. i) The proposed dwelling house is located on a house pad which is appropriate with regards to topographic constraints. j) The proposal does not involve complex engineering solutions.	☒Compliant ☐N/A ☐Performance Solution

4.3.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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** 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.	**AO1** The proposal is not located on parts of the site that are not within the Hillslopes constraints sub-category.	☒Compliant ☐N/A ☐Performance Solution
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%)	**AO2.1** The proposed dwelling house is on a house pad which does not occur in excess of 1 in 6.	☒Compliant ☐N/A ☐Performance Solution
	AO2.2 Where development on land steeper than 1 in 6 (16.6%) cannot be avoided, development follows the natural contours of the site.	**AO2.2** The proposed dwelling house is on a house pad which does not occur in excess of 1 in 6.	☒Compliant ☐N/A ☐Performance Solution
	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.	**AO2.3** The proposed access ways and driveway will be constructed with surface materials that blend with the surrounding environment.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	AO2.4 The clearing or disturbance of vegetation is limited to clearing and disturbance that: 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.	**AO2.4** The proposal is for a new dwelling house upon an approved and carried out subdivision and results in minimal vegetation clearing.	☒Compliant ☐N/A ☐Performance Solution
	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).	**AO2.5** The proposed dwelling house is on a house pad which does not occur in excess of 1 in 6.	☒Compliant ☐N/A ☐Performance Solution
	AO2.6 Development does not alter the sky line.	**AO2.6** The proposal does not alter the sky line.	☒Compliant ☐N/A ☐Performance Solution
	AO2.7 Buildings and structures: a) are finished predominantly in the following exterior colours or surfaces: i. moderately dark to darker shades	**AO2.7** The proposed dwelling house will be finished with exterior colours in accordance with the acceptable outcome.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	of olive green, brown, green, blue, or charcoal; or (i) moderately dark to darker wood stains that blend with the colour and hues of the surrounding vegetation and landscape; b) are not finished in the following exterior colours or surfaces: 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.		
	AO2.8 Exterior colour schemes limit the use of white or other light colours to exterior trim and highlighting of architectural features	**AO2.8** The proposed dwelling house will be finished with exterior colours in accordance with the acceptable outcome.	☒Compliant ☐N/A ☐Performance Solution
	AO2.9 Areas between the first floor (including outdoor deck areas) and ground level are screened from view.	**AO2.9** Any screening requirements can be conditioned by Council accordingly.	☒Compliant ☐N/A ☐Performance Solution
	AO2.10 Recreational or ornamental features (including tennis courts, ponds or swimming pools) do not occur on land: a) with a gradient of 1 in 6 (16.6%) or	**AO2.10** The proposed dwelling house including the pool is on a house pad which does not occur in excess of 1 in 6.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	more; **b)** are designed to be sited and respond to the natural constraints of the land and require minimal earthworks.		
PO3 Excavation or filling does not have an adverse impact on the amenity, safety, stability or function of the site or adjoining premises through: 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: 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.	**AO3** The proposal does not require excavation or fill nominated in the acceptable outcome.	☐Compliant ☒N/A ☐Performance Solution
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: 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.	**AO4.1** The proposal is for a new dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	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.	**AO4.2** The proposal is for a new dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO4.3 Development does not alter ridgelines.	**AO4.3** The proposal is for a new dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution
	AO4.4 Lots are designed to ensure rooflines of future buildings and structures do not protrude above a ridgeline.	**AO4.4** The proposal is for a new dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

4.4 Natural Areas Overlay Code

4.4.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Natural areas overlay code is to: a) implement the policy direction in the Strategic Framework, in particular: (i) Theme 2: Environment and landscape values, Element 3.5.3 Biodiversity, Element 3.5.4 Coastal zones; (ii) Theme 3: Natural resource management Element 3.6.2 Land and catchment management, Element 3.6.3 Primary production, forestry and fisheries. b) enable an assessment of whether development is suitable on land within the Biodiversity area overlay sub-categories.		
2) The purpose of the code will be achieved through the following overall outcomes:		
a) development is avoided within: i. areas containing matters of state environmental significance (MSES); ii. other natural areas; iii. wetlands and wetland buffers; iv. waterways and waterway corridors. b) where development cannot be avoided, development: i. protects and enhances areas containing matters of state environmental significance; ii. provides appropriate buffers; iii. protects the known populations and supporting habitat of rare and threatened flora and fauna species, as listed in the relevant State and Commonwealth legislation; iv. ensures that adverse direct or indirect impacts on areas of environmental significance are minimised through design, siting, operation, management and mitigation measures;	a) The proposed dwelling house is located outside of state environmental significance areas, natural areas, wetlands and wetland buffers and waterways; b) The proposed development results in minimal site works and has been designed to protect the environmental significance characteristics of the site.	☒Compliant ☐N/A ☐Performance Solution

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
v. does not cause adverse impacts on the integrity and quality of water in upstream or downstream catchments, including the Great Barrier Reef World Heritage Area; vi. protects and maintains ecological and hydrological functions of wetlands, waterways and waterway corridors; vii. enhances connectivity across barriers for aquatic species and habitats; rehabilitates degraded areas to provide improved habitat condition, connectivity, function and extent; viii. protects areas of environmental significance from weeds, pests and invasive species. c) strategic rehabilitation is directed to areas on or off site, where it is possible to achieve expanded habitats and increased connectivity.		

4.4.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	**AO1.1** The proposal avoids significant impact on the relevant environmental values.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	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.	**AO1.2** The proposal avoids significant impact on the relevant environmental values.	☒Compliant ☐N/A ☐Performance Solution
	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.	**AO1.2** The proposal avoids significant impact on the relevant environmental values.	☒Compliant ☐N/A ☐Performance Solution
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	**AO2** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	not negatively affect ecologically important areas; e) ensuring that significant fauna habitats are protected in their environmental context; and f) incorporating measures that allow for the safe movement of fauna through the site.		
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.	**AO3.1** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution
	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.	**AO3.2** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution
PO4 Wetland and wetland buffer areas are maintained, protected and restored.	**AO4.1** Native vegetation within wetlands and wetland buffer areas is retained.	**AO4.1** The subject site is not located within a wetland or wetland buffer area.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	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.	**AO4.2** The subject site is not located within a wetland or wetland buffer area.	☐Compliant ☒N/A ☐Performance Solution
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.	**AO5.1** The proposal is for a dwelling house and does not introduce non-native species.	☐Compliant ☒N/A ☐Performance Solution
	AO5.2 The threat of existing pest species is controlled by adopting pest management practices for long-term ecological integrity.	**AO5.1** The proposal is for a dwelling house and does not introduce non-native species.	☐Compliant ☒N/A ☐Performance Solution
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.	**AO6.1** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution
	AO6.2 Development within an ecological corridor rehabilitates native vegetation.	**AO6.2** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	AO6.3 Development within a conservation corridor mitigates adverse impacts on native fauna, feeding, nesting, breeding and roosting sites and native fauna movements.	**AO6.3** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution
PO7 Development minimises disturbance to matters of state environmental significance (including existing ecological corridors).	**AO7.1** Development avoids shading of vegetation by setting back buildings by a distance equivalent to the height of the native vegetation.	**AO7.1** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution
	AO7.2 Development does not encroach within 10 metres of existing riparian vegetation and watercourses.	**AO7.2** The proposal is located upon an existing house pad and requires minimal site works to facilitate the dwelling house. The proposal will avoid significant impacts on matters of environmental significance.	☒Compliant ☐N/A ☐Performance Solution
Waterways in an urban area			
PO8 Development is set back from waterways to protect and maintain:	**AO8.1** Where a waterway is contained within an easement or a reserve required for that purpose, development does not occur	**AO8.1** The subject site is not located upon a waterway.	☐Compliant ☒N/A

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
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.	within the easement or reserve;		☐Performance Solution
	AO8.2 Development does not occur on the part of the site affected by the waterway corridor.	**AO8.2** The subject site is not located upon a waterway.	☐Compliant ☒N/A ☐Performance Solution
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.	**A9** The subject site is not located upon a waterway.	☐Compliant ☒N/A ☐Performance Solution

4.5 Potential Landslide overlay Code

4.5.1 Purpose

PURPOSE & OVERALL OUTCOMES	PROPOSAL	COMPLIANCE
1) The purpose of the Potential landslide hazard overlay code is: a) implement the policy direction of the Strategic Framework, in particular: (i) Theme 1: Settlement pattern Element 3.4.7 Mitigation of hazards. b) enable an assessment of whether development is suitable on land within the Potential landslip hazard overlay.		
2) The purpose of the code will be achieved through the following overall outcomes:		
a) development is located, designed and constructed to not put at risk the safety of people, property and the environment; b) development is not at risk from and does not pose a risk to adjacent and nearby sites from landslides; c) ensures that community infrastructure is protected from the effects of potential landslides; d) ensures that vegetation clearing, stormwater management and filling and/or excavation does not create a landslide hazard and/or rectifies potential pre-existing landslide risks; e) development does not occur where works to provide a solution for safety of people, property or the environment involves complex engineering solutions to overcome the risk, or would result in a built form or outcome that causes an adverse visual impact on the Hillslopes or Landscape values of Douglas Shire.	A) The proposed dwelling house is located, designed and constructed to reduce the risk of people, property and the environment; B) The proposal does not pose a risk to adjacent and nearby sites; C) The proposal is for a dwelling house; D) The development involves minimal site work as the dwelling house is to be positioned on the existing house pad. E) Please refer to the geotechnical report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution

4.5.2 Performance Outcomes & Acceptable Outcomes

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
For self-assessable and assessable development			
PO1 The siting and design of development does not involve complex engineering solutions and does not create or increase the potential landslide hazard risk to the site or adjoining premises through: a) building design; b) increased slope; c) removal of vegetation; d) stability of soil; e) earthworks; f) alteration of existing ground water or surface water paths; g) waste disposal areas.	**AO1.1** Development is located on that part of the site not affected by the Potential landslide hazard overlay.	**AO1** The proposed dwelling house is strategically positioned to minimise any potential landslide hazard impacts. Please refer to the geotechnical report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
	AO1.2 Development is on an existing stable, benched site and requires no further earthworks	**AO1.2** The proposed dwelling house is strategically positioned to minimise any potential landslide hazard impacts. Please refer to the geotechnical report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution
	AO1.3 A competent person certifies that: a) the stability of the site, including associated buildings and infrastructure, will be maintained during the course of the development and will remain stable for the life of the development; b) development of the site will not increase the risk of landslide hazard activity on other land, including land above the site; c) the site is not subject to the risk of landslide activity on other land; d) any measures identified in a site-specific	**AO1.3** The proposed dwelling house is strategically positioned to minimise any potential landslide hazard impacts. Please refer to the geotechnical report submitted as part of the application.	☒Compliant ☐N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
	geotechnical report for stabilising the site or development have been fully implemented; e) development does not concentrate existing ground water and surface water paths; f) development does not incorporate on-site waste water disposal.		
PO2 The siting and design of necessary retaining structures does not cause an adverse visual impact on landscape character or scenic amenity quality of the area.	**AO2** Excavation or fill: 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.	**AO2** The proposal does not require excavation or fill identified within the acceptable outcome.	☒Compliant ☐N/A ☐Performance Solution
Additional requirements for Community infrastructure			
PO3 Development for community infrastructure: a) is not at risk from the potential landslide hazard areas; b) will function without impediment	**AO3** Development is designed in accordance with the recommendations of a site-specific geotechnical assessment which makes reference to the community infrastructure and its needs and function.	**AO3** The proposal is for a dwelling house. As such, this criterion is not applicable.	☐Compliant ☒N/A ☐Performance Solution

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	PROPOSAL	COMPLIANCE
from a landslide; c) provides access to the infrastructure without impediment from the effects of a landslide; d) does not contribute to an elevated risk of a landslide to adjoining properties.			

1 - SITE PLAN

NOTE: EXACT LOCATION AND ORIENTATION OF DWELLING TO BE CONFIRMED

ARCHITECT

OFFICE Deicke

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ABN 66 655 606 858

AMENDMENTS

ISSUE	DATE	SUBJECT	AUTH
A	25.04.2022	CONSULTANT ISSUE	JD
B	04.05.2022	PRELIMINARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT

DEBELL PROPERTY TRUST

PROJECT NAME

MOSSMAN

DRAWING NAME

SITE PLAN

PROJECT NO. 21.004

SCALE 1:500 @ A1

DRAWING NO. DA_A0_0101

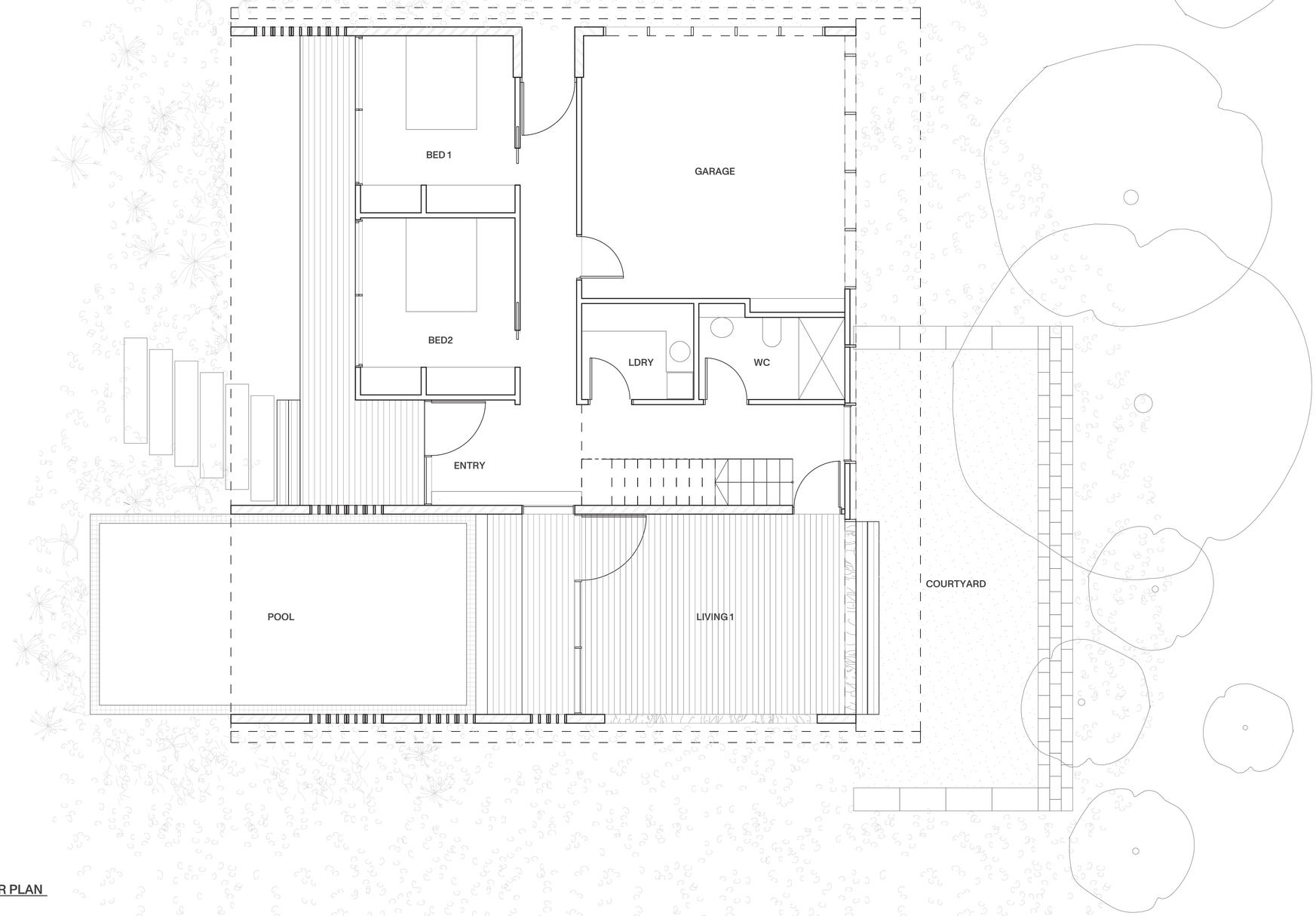
REVISION B

DRAWN CD

CHECKED JD

AUTH. JD

STATUS DEVELOPMENT APPLICATION



1 - GROUND FLOOR PLAN

ARCHITECT

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B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 3 HOUSE GROUND FLOOR PLAN

PROJECT NO.
21.004

SCALE
1:50 @ A1

DRAWING NO.
DA_A3_0201

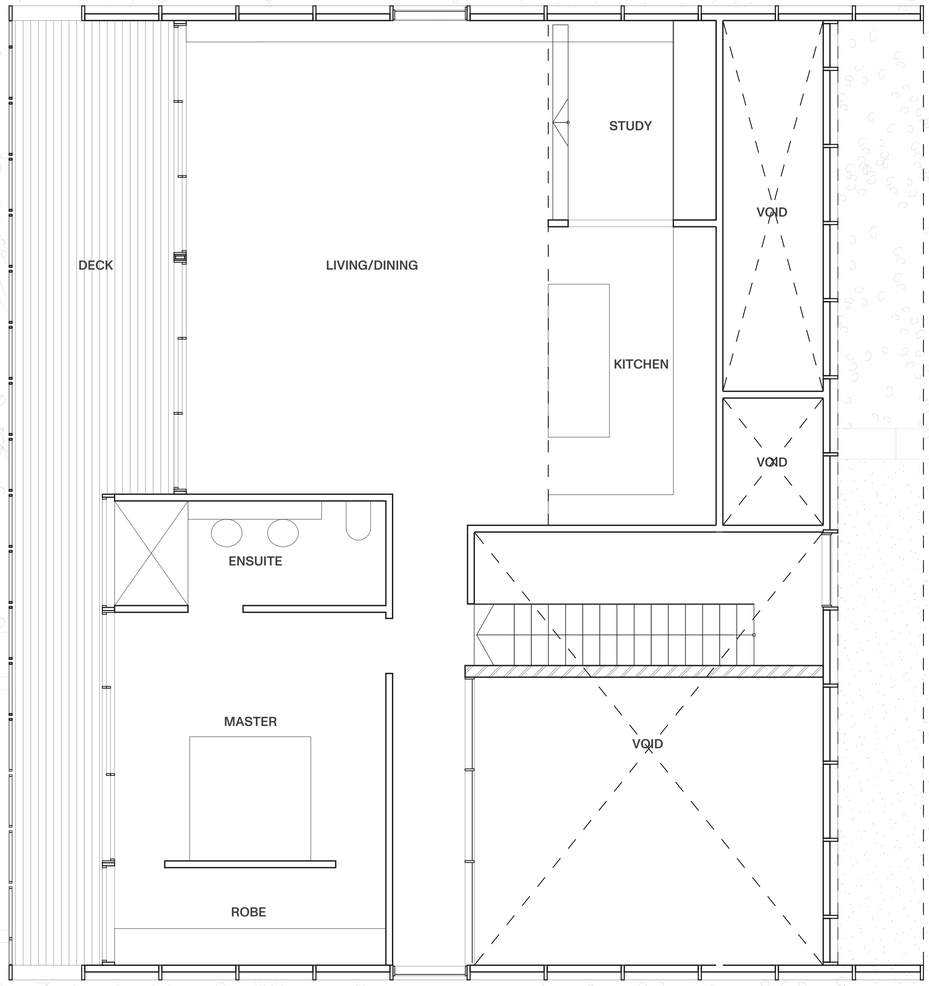
REVISION
B

DRAWN
CD

CHECKED
JD

AUTH.
JD

STATUS
DEVELOPMENT APPLICATION



2 - FIRST FLOOR PLAN

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B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 3 HOUSE FIRST FLOOR PLAN

PROJECT NO.
21.004

DRAWING NO.
DA_A3_0202

REVISION
B

SCALE
1:50 @ A1

DRAWN
CD

CHECKED
JD

AUTH.
JD

STATUS
DEVELOPMENT APPLICATION

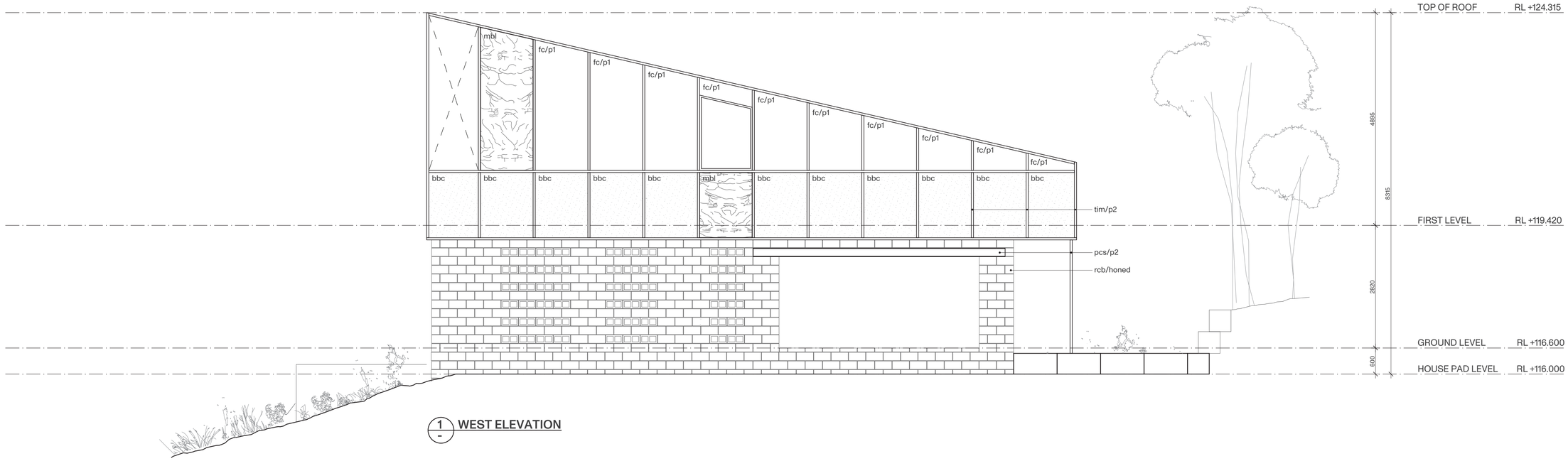
LEGEND

bbc	Blackbutt Cladding
crs	Colorbond Roof Sheeting
em	Expanded Metal Cladding
fc/p1	Fibre Cement Sheeting - Natural White
fc/p2	Fibre Cement Sheeting - Botanic
mbl	Marble
pcs/p2	Powdercoated Steel - Botanic
rcb/honed	Reinforced Concrete Block - Honed
tim	Timber - Unpainted
tim/p2	Timber - Botanic

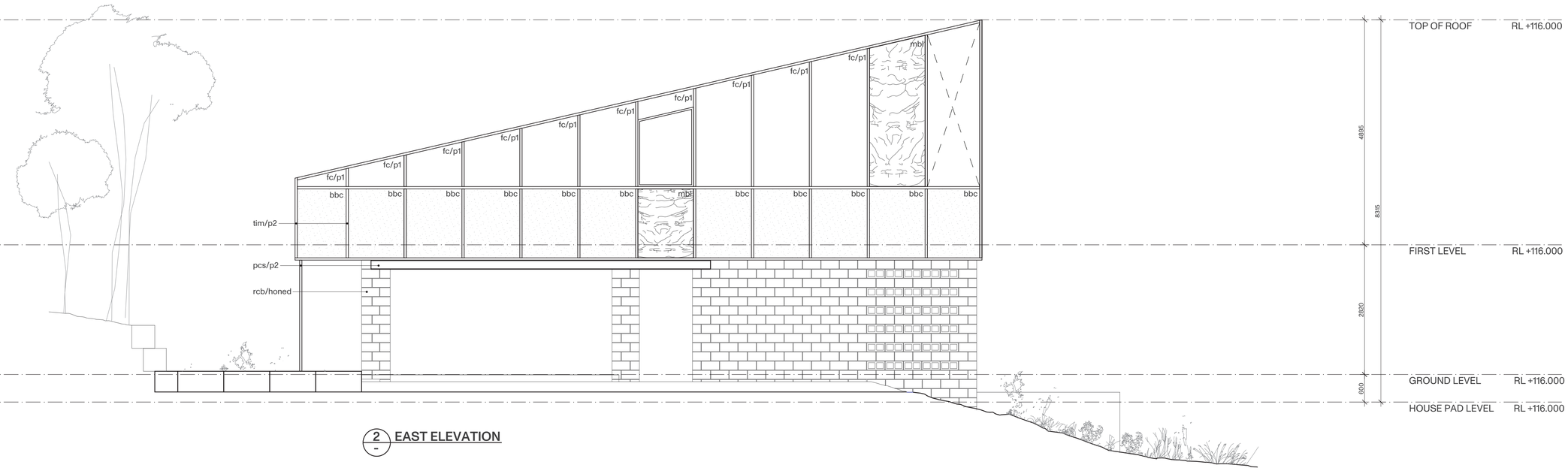
PAINT COLOURS

P1 - Dulux Natural White

P2 - Resene Botanic



1 - WEST ELEVATION



2 - EAST ELEVATION

ARCHITECT

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AMENDMENTS

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A	25.04.2022	CONSULTANT ISSUE	JD
B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 3 HOUSE ELEVATIONS

PROJECT NO. 21.004

SCALE 1:50 @ A1

DRAWING NO. DA_A3_0401

REVISION B

DRAWN CD

CHECKED JD

AUTH. JD

STATUS
DEVELOPMENT APPLICATION

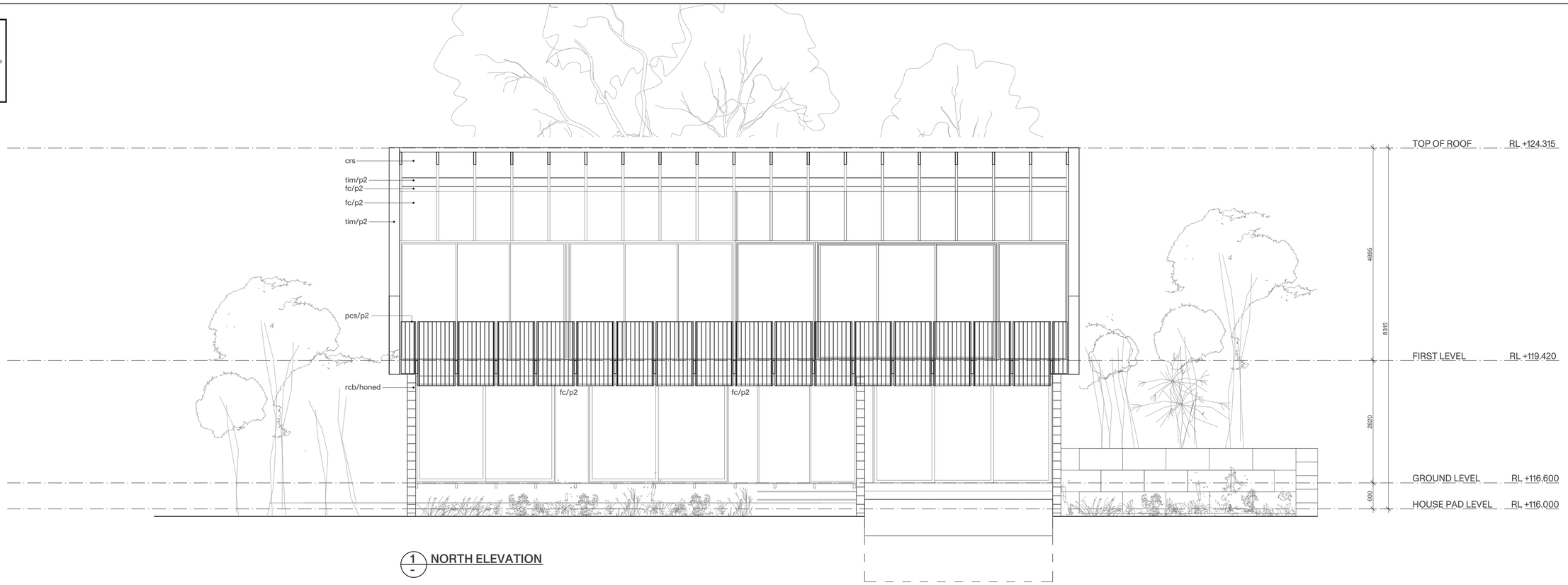
LEGEND

bbc	Blackbutt Cladding
crs	Colorbond Roof Sheeting
em	Expanded Metal Cladding
fc/p1	Fibre Cement Sheeting - Natural White
fc/p2	Fibre Cement Sheeting - Botanic
pcs/p2	Powdercoated Steel - Botanic
rcb/honed	Reinforced Concrete Block - Honed
tim	Timber - Unpainted
tim/p2	Timber - Botanic

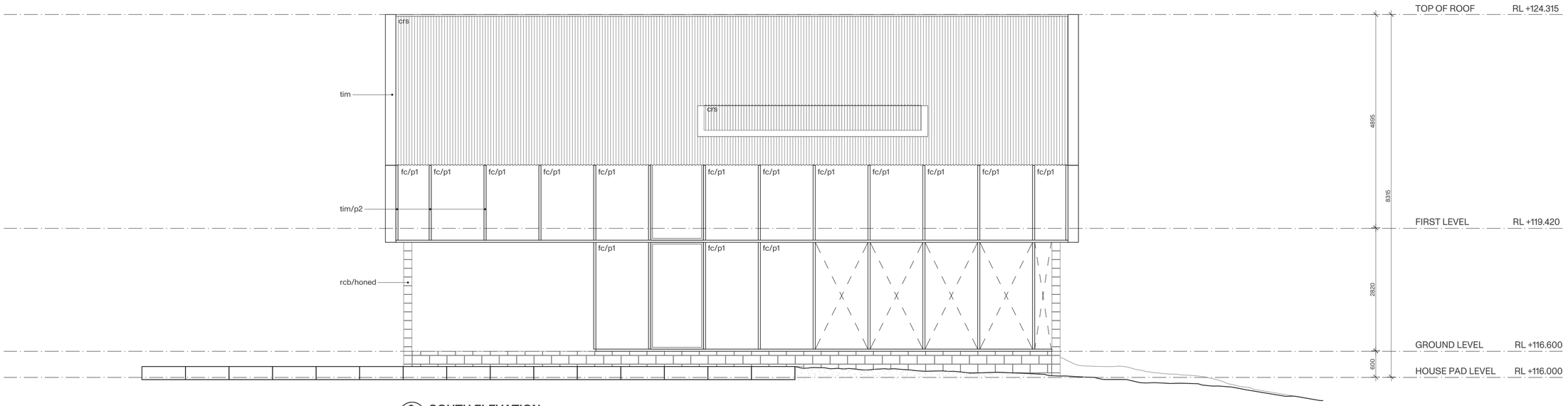
PAINT COLOURS

P1 - Dulux Natural White

P2 - Resene Botanic



1 - NORTH ELEVATION



2 - SOUTH ELEVATION

ARCHITECT

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AMENDMENTS

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B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 3 HOUSE ELEVATIONS

PROJECT NO. 21.004

DRAWING NO. DA_A3_0402

SCALE 1:50 @ A1

REVISION B

DRAWN CD

CHECKED JD

AUTH. JD

STATUS
DEVELOPMENT APPLICATION

LOT 2 HOUSE

Roof Sheeting

COLORBOND® steel Monument
RGB 19 32 43

Concrete Block

Austral Masonry GB Honed Porcelain

Paint Colour 1

Dulux® Natural White PN1E1
RGB 238 236 229

Paint Colour 2

Dulux Kelburn
RGB 168 92 96

Paint Colour 3

Resene Celestial Blue
RGB 26 32 47

Timber

Blackbutt

LOT 3 HOUSE

Roof Sheeting

COLORBOND® steel Surfmist
RGB 215 214 203

Concrete Block

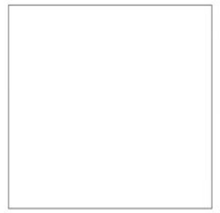
Austral Masonry GB Honed Porcelain

Paint Colour 1

Dulux® Natural White PN1E1
RGB 238 236 229

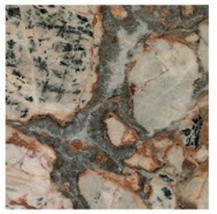
Paint Colour 2

Resene Botanic
RGB 33 64 43



Timber

Blackbutt



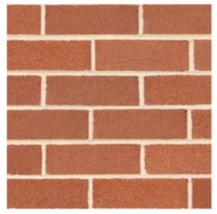
Marble

Cairns Marble 'Dreamtime'

LOT 4 HOUSE

Roof Sheeting

COLORBOND® steel Surfmist
RGB 215 214 203



Brick

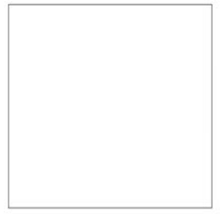
PGH Dry Pressed Arhictectural - Flinders Red

Paint Colour 1

Dulux® Natural White PN1E1
RGB 238 236 229

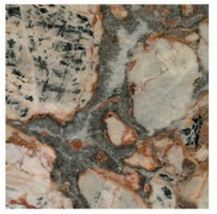
Paint Colour 2

Dulux Henna Red
RGB 109 51 48



Timber

Blackbutt



Marble

Cairns Marble 'Dreamtime'

ARCHITECT

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ABN 66 655 606 858

AMENDMENTS

ISSUE	DATE	SUBJECT	AUTH
A	29.06.2022	PRERLIMINARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

PROJECT NO.
21.004

SCALE
NTS

DRAWING NO.
DA_INFO_001

REVISION
A

DRAWING NAME
FINISHES SCHEDULE

DRAWN
CD

CHECKED
JD

AUTH.
JD

STATUS
DEVELOPMENT APPLICATION

29 June 2022

RE: MATERIAL CHANGE OF USE FOR 3 X DWELLING HOUSES UPON LAND AT 1299A, 1299B & 1299C MOSSMAN DAINTREE RD, ROCKY POINT

We, **DEBELL PROPERTY PTY LTD A.C.N 655 606 625 TRUSTEE UNDER INSTRUMENT** *721498908 the registered owners of 1299a, 1299b & 1299c Mossman Daintree rd, rocky point (Lot 2- 4 on SP238245) hereby grant consent for a development application to be lodged with Council under the Planning Act 2016 by Town Planning Alliance Pty Ltd.*

1.	
(Name of Sole Director)	*Signature of Sole Director*
SOLE DIRECTOR	
TITLE	*A B N / A C N*

OR

1. JOHN DEICKE	V. Deicke
(Name of Director/~~Secretary~~)	*Signature of Director/Secretary*
DIRECTOR	655 606 625
(TITLE)	*A B N / A C N*
2. FIONA CAMPBELL	F Campbell.
(Name of Director/Secretary)	*Signature of Director/Secretary*
	655 606 625
(TITLE: (Director or Secretary)	*A B N / A C N*

EXECUTED IN ACCORDANCE WITH SECTION 127 OF THE CORPORATIONS ACT 2001 (CTH)

NB:
If there are multiple companies that own the abovementioned property, this template will need to be duplicated and signed by the relevant signatories of each company under the Corporations Act 2001 (CTH)

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Geotechnical Investigation

Proposed Residences
Mossman Daintree Road, Rocky Point

Prepared for
Office Deicke

Project 214803.00
June 2022

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	214803.00	Document No.	R.001.Rev0
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Report prepared for	Office Deicke		
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Revision 0	1	0	Mr John Deicke, Office Deicke

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		10 June 2022
Reviewer		10 June 2022

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Appendix E: Laboratory test results

Report on Geotechnical Investigation
Proposed Residences
Mossman Daintree Road, Rocky Point

1. Introduction

This report presents the results of geotechnical investigation undertaken by Douglas Partners Pty Ltd (DP) for three proposed residential dwellings at Mossman Daintree Road, Rocky Point. The investigation was commissioned in an email dated 28 April 2022 by Mr John Deicke of Office Deicke and was undertaken in accordance with DP proposal 214803.00.P.001.Rev0 dated 23 April 2022.

It is understood that the project includes the construction of three residential dwellings on separate but adjoining allotments of the subdivided 1299 Mossman Daintree Road.

The aim of the investigation was to assess the subsurface soil and groundwater conditions at the field test locations to provide:

- site classification to AS 2870 (2011);
- excavation conditions and suitable temporary and permanent batter slopes;
- site preparation earthworks and suitability of site won materials for re-use as engineered fill;
- geotechnical retaining wall design parameters;
- footing options and footing design parameters; and
- allocation of soil categories and determination of design soil permeability and design effluent loading rates based on AS 1547 (2012).

Slope risk assessment was excluded from the requested scope of work.

The investigation included the excavation of ten test pits and laboratory testing of selected samples. The details of the field and laboratory work are presented in this report, together with comments and recommendations on the items listed above.

This report must be read in conjunction with the notes entitled 'About This Report' in Appendix A and other explanatory notes, and should be kept in its entirety without separation of individual pages or sections.

2. Proposed Development

DP was supplied with a preliminary site plan (Drawing SD_A01_0101 dated 4 February 2022) for the purposes of investigation planning which is included in Appendix B for ease of reference. This plan indicated the proposed development to comprise the construction of three, two-level residential dwellings on the existing building platforms. It is assumed the buildings will be constructed using lightweight materials, elevated above ground and supported by steel posts.

3. Site Description

The site (designated as 1299A to 1299C Mossman Daintree Road) comprises three adjoining allotments within a battle-axe area above an existing residence (refer Drawing 1 in Appendix B and Figure 1 below). Each lot is approximately rectangular in shape, and comprising an area of 3042 m^2 (Lots 3 and 4) or 4092 m^2 (Lot 2). For the purposes of this report, 'site' refers to the combined area of the three allotments.

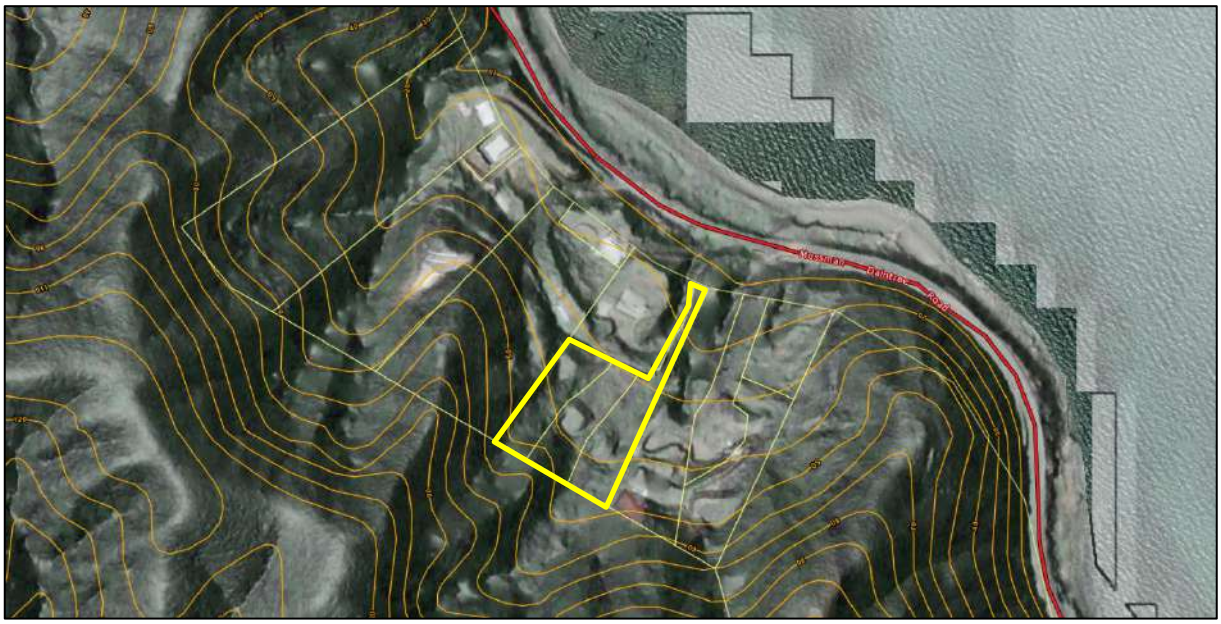

Figure 1: Qld Globe image showing site location in yellow outline.

The site is situated on the north-eastern facing foot slopes of the Dagmar Range and site elevations approximately range from 35 AHD to 55 AHD. Much of the southwestern portion of the site (approximately 25%) comprises steeply sloping hillside vegetated by dense rainforest.

Previous earthworks are evident on site including the preparation of building platforms using 'cut to fill' methodology, and an open unlined drain has been excavated along much of the site's eastern boundary, presumably to divert overland flows down to the road reserve. No structures were observed within site boundaries and other than that for the above earthworks, it appears that no previous site development has occurred.

The main portion of the site, below the south-western steep slopes, has mostly been cleared of native vegetation and is generally vegetated by short grass with several large trees and shrubs present mostly around the building platforms (refer Figures 2 to 5). The terrain in the cleared portions is generally uneven and hummocky, and the building platforms appear to have been created by localised cutting and filling. The natural slope gradients downhill of the of the building platforms generally range between 10° to 15°(ie 'moderately' sloping).

The site is bordered by residential properties downhill to the north, east and west, and steeply sloping, densely vegetated slopes uphill to the south.

Figure 2: Showing general site conditions. Photo is from the end of the shared driveway with a view towards the southwest.

Figure 3: View looking northeast showing the building platform at 1299A.

Figure 4: View looking northeast showing the building platform at 1299B.

Figure 5: View looking west showing the building platform at 1299C.

4. Geology

Reference to the Mossman 1:100,000 Geological Series Sheet (Department of Mines and Energy, 1999) indicates that the site is underlain by Hodgkinson Formation bedrock typically comprising siltstone and fine to coarse grained arenite, and residual soils thereof.

Investigation findings are generally consistent with the published findings however colluvial materials were commonly encountered, generally overlying residual soils in the majority of the test locations.

5. Field Work

5.1 Methods

The field work was completed on 4 May 2022 and comprised the excavation of ten test pits, designated as Pits 1 to 10, to depths ranging from 1.7 m to 3.9 m. Approximate test locations are shown on Drawing 1 in Appendix B.

The pits were excavated using a 5.5 tonne excavator. Strata identification was through observation of excavated spoil, and soil samples were taken at regular depth intervals for laboratory testing. Pocket penetrometer readings were taken in the walls of the pits and dynamic cone penetrometer (DCP) tests were undertaken alongside the pits to provide additional information for assessment of soil strength consistency. On completion of excavation, the pits were backfilled with excavated spoil in layers which were nominally compacted using the back of the excavator bucket. Any excess spoil was mounded and track rolled at the surface.

The field work was carried out in the presence of a DP engineering geologist.

A differential GPS unit was used to record UTM co-ordinates to GDA94. Surface levels were extrapolated from a supplied contour drawing. The co-ordinates and surface levels are presented on the test pit logs in Appendix D.

5.2 Results

The subsurface conditions encountered in the pits are detailed on the logs in Appendix D. Notes defining the sampling methods, soil descriptions, and symbols and abbreviations used in their preparation are given in Appendix A.

Subsurface conditions may be grouped into two areas for discussion, the building platform (ie modified) areas and downslope (ie natural) areas.

Fill, comprising medium dense clayey sandy gravel (similar to the naturally occurring colluvium encountered elsewhere on site) was encountered in Pits 2, 4 and 6 to depths of between 1.2 m and 2.2 m.

Natural materials encountered within the majority of the building platform test locations, either below the fill or from the surface (refer Pits 1, 2 and 4 to 6) are broadly characterised by colluvial clayey or silty

sandy gravel with cobbles (generally assessed to be medium dense or denser), underlain in Pits 5 and 6 by stiff or stronger residual clayey silt, transitioning to weathered siltstone within which virtual excavator refusal occurred on probable very low strength or stronger rock. Colluvium was not encountered in Pit 3, which encountered hard, residual clayey silt to 1.5 m depth, overlying siltstone to virtual excavator refusal at 1.7 m depth.

Within the downslope hillside test locations (refer Pits 7 to 10), ground conditions generally comprised a shallow (0.15 m or 0.2 m thick) layer of firm or stronger clayey silt topsoil overlying stiff or stronger clayey silt. The exception to this generalised profile description was the presence of very stiff silty clay encountered below 1.5 m depth in Pit 7, to the limit of investigation.

Free groundwater was not observed in any of the test pits, however it should be noted that groundwater depths and ground moisture conditions are affected by climatic conditions, soil permeability and human influences, and will therefore vary with time. Rocky Point is in the wet tropics and subject to wet and dry seasons, during which the groundwater levels may be prone to vary considerably.

Deeply eroded ephemeral water courses / surface drains were observed to the east and north of site indicating the likelihood of significant overland flows during and following significant rainfall events.

6. Laboratory Testing

6.1 Geotechnical Laboratory Testing

Geotechnical laboratory testing comprised:

- Atterberg limits, linear shrinkage, and field moisture content (three tests); and
- Particle size distribution, greater than 0.075 mm (two tests).

Geotechnical laboratory results are summarised in Tables 1 and 2, with laboratory certificates presented in Appendix E.

Table 1: Results of Laboratory Testing – Field Moisture, Atterberg Limits and Linear Shrinkage

Pit	Depth (m)	Primary Description	FMC (%)	LL (%)	PL (%)	PI (%)	LS (%)
4	0.5	Clayey Sandy GRAVEL	18.1	28	23	5	3.5
5	1.0	Clayey SILT	18.0	34	23	11	4.5
8	0.3	Clayey SILT	14.7	24	19	5	2.5

Notes to Table 3
FMC - Field Moisture Content LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index LS – Linear Shrinkage

Table 2: Results of Laboratory Testing - Gradings

Pit	Depth (m)	Primary Description	Gravel (%)	Sand (%)	Silt and clay (%)
1	0.4	Clayey Sandy GRAVEL	38	30	32
4	0.5	Clayey GRAVEL	52	19	29

6.2 Effluent Disposal Laboratory Testing

Effluent disposal laboratory testing comprised:

- Emerson class number, soil pH, electrical conductivity (EC), cation exchange capacity (three tests); and
- total nitrogen, sodium adsorption ratio, phosphorous absorption capacity (three tests).

Effluent disposal laboratory results are summarised in Tables 3 and 4, with laboratory certificates presented in Appendix E.

Table 3: Results of pH, EC, Phosphorous Ssorption and Emerson Class Number Testing

Pit	Depth (m)	Primary Description	Soil pH 1:5	EC (µS/cm)	Phosphorous Sorption Capacity (mgP/kg)	Total Nitrogen in Soil (mg/kg)	Sodium Adsorption Ratio	Emerson Class Number
7	1.7	Silty CLAY	5.9	48	670	170	1.2	5
9	1.5	Clayey SILT	5.2	51	560	180	1.8	6
10	1.0	Clayey SILT	5.4	45	530	270	0.56	5

Table 4: Results of Cation Exchange Capacity Testing

Pit	Depth (m)	Description	Calcium (meq%)	Potassium (meq%)	Magnesium (meq%)	Sodium (meq%)	CEC (meq%)	ESP (%)
7	1.7	Silty CLAY	0.2	<0.1	0.1	<0.1	<1	<1
9	1.5	Clayey SILT	0.1	<0.1	<0.1	<0.1	<1	<1
10	1.0	Clayey SILT	0.5	<0.1	0.2	<0.1	<1	<1

Legend: CEC – cation exchange capacity
ESP – exchangeable sodium percentage

7. Comments

7.1 Appreciation of Site Geotechnical Conditions

The natural ground conditions at the field test locations are generally characterised as comprising medium dense or denser colluvial soils consisting of varying proportions of clayey silt, sand, gravel and cobbles, generally overlying residual stiff or stronger clayey silt transitioning with depth to weathered siltstone bedrock. Fill of similar properties to the colluvial soils was encountered to depths of between 1.2 m and 2.2 m within the north-western portions of each of the building platforms. It is assumed that the fill has been site-won from the uphill (south-western) sides of the building platform areas.

In isolation of upslope instability risk, the assessment of which was not requested by the client but is assumed to have been completed by others, the primary geohazard for this project is anticipated to be that of the existing uncontrolled fill, which should not be relied upon for structural support. The design of on-site effluent disposal systems should only be undertaken by appropriately experienced personnel familiar with the site and climatic conditions, giving particular consideration to hydraulic balance during the wet season.

Further comments on design and construction are given in the following sections of the report.

7.2 Site Classification

AS 2870 (2011) states that site classification is based on expected ground surface movement. Surface movement is usually due to soil reactivity under normal moisture conditions, however in some cases the level of ground movement may be controlled by other factors. Sites where ground movements may be significantly affected by factors other than reactive soil movements under normal moisture conditions are classified as 'Class P' under the standard and footing design must by based on engineering principles.

AS2870 (2011) provides a list of scenarios that would require a 'Class P' classification, including the presence of 'uncontrolled' fill, which applies to the existing building platforms in their current conditions.

7.3 Excavation Conditions

Excavations for high level footings and trenches for effluent disposal are anticipated to encounter either colluvial clayey/silty sandy gravel or residual clayey silt transitioning to very low strength weathered siltstone. It is considered that the colluvial and residual soils should be readily excavatable by standard small sized (ie 12 – 20 tonne) earthmoving equipment. Ripping would likely be required for excavations within low strength or stronger siltstone, depending on fracturing and strength variability.

7.4 Batter Slopes

Short-term temporary batter slopes of 1.5H:1V are suggested for unsurcharged, dry, temporary excavations in natural in-situ soils or existing fill up to 3 m deep. Permanent batter slope angles of no steeper than 3H:1V are suggested, with steeper slopes requiring additional geotechnical assessment, possibly requiring the construction of engineer designed retaining walls (refer Section 7.6).

Stockpiles or heavy plant should not be placed near the batter crests, as this may instigate slope failure. Further advice should be sought from DP if such surcharge is located within the batter vertical height laterally behind the crest.

Surface runoff should be diverted away from the crests and toes of the batters to reduce the potential for scour erosion. It is also recommended that all batters incorporate crest and toe drains and be appropriately vegetated with respect to erosion control.

7.5 Site Preparation

It is suggested that site preparation and fill for the support of ground slabs, pavements and upper level footings be carried out in accordance with the following guidelines::

- Remove all existing uncontrolled fill, surface vegetation, organic topsoil, and any deleterious soft, wet or highly compressible material;.
- Tine the subgrade and adjust the moisture content to within 2% of optimum moisture content for standard compaction (SOMC);
- Compact the subgrade with at least six passes of a minimum 12 t static weight smooth drum roller. Test roll the compacted subgrade under careful inspection by a geotechnical engineer to detect any remaining relatively soft or loose zones, which should be excavated out and replaced with approved engineered fill under ‘Level 1’ inspection and testing;
- If additional fill is required, place approved engineered fill in layers not exceeding 200 mm loose thickness, and compact to at least 98% standard dry density ratio or density index of at least 75%. Moisture contents within cohesive fill should be maintained within 2% of SOMC, during and after compaction; and
- Undertake ‘Level 1’ inspection and testing for all additional fill placement works, in accordance with AS 3798 (2007).

It is important to note that dry, over-compacted cohesive fill or cohesive subgrade (ie compacted to move than 102% SMDD and dry of OMC) is generally more prone to swelling and softening. For this reason, fill compaction and moisture should be carefully controlled on site, with both compaction and moisture control criteria included in the bulk earthworks specification.

Fill placement and compaction under ‘Level 1’ inspection and testing in accordance with AS 3798 (2007), is required where structural loads are to be supported by fill. A ‘Level 1’ inspection and test report must also be prepared at the completion of the works stating that the fill has been completed as recommended above and as required by AS 3798 (2007).

7.6 Retaining Walls

Table 5 presents lateral earth pressure, bulk density and sliding coefficient for the various soils encountered.

Table 5: Geotechnical Retaining Wall Design Parameters

Material	Strength Consistency /Relative Density	Ka	Ko	Kp	Bulk Unit Weight (kN/m^3)	tanδ*
Clayey Silt / Silty Clay	Stiff	0.4	0.55	2.5	18	0.3
	Very stiff or hard	0.4	0.55	2.5	20	
Granular	Medium dense (or denser)	0.28	0.45	3.5	20	0.4

Notes: * for concrete cast directly onto the clean soil surface

For design of retaining walls, due allowance should be made for the following:

- Surcharge loadings (over and above the lateral earth pressure coefficients presented above) where the finished ground level above retaining walls is above horizontal and where additional loading is likely to be applied from existing or future upslope structures, or from traffic.
- Drainage material installed for the full height behind the wall, to a width of at least 0.3 m. The material must be free draining and granular and have a perforated or slotted drainage pipe at the heel of the wall to rapidly remove the water into the stormwater system. If drainage is not provided, the wall loading caused by flooding or inundation, must be considered. Such flooding may penetrate up to 0.9 m depth into cracks behind the wall and result in a hydrostatic load.

Care should be taken when placing soils behind retaining walls, to reduce the risk of damage associated with the use of heavy compaction plant and swelling. Compaction should not exceed 95% to 98% standard maximum dry density ratio and all filling should be placed within 2% of OMC.

It is recommended that factors of safety of 2 against overturning and sliding stability and 1.5 for global stability, be adopted in the design of all retaining walls.

For limit state design methods, the ultimate parameters provided above in Table 5 will need to be factored in accordance with (AS 4678, 2002). Guidance on the selection of material strength partial factors is provided in Section 5.2 of (AS 4678, 2002) and is dependent upon the nature and state of the natural in-situ soil.

7.7 Footings

High level pad and strip footings up to 1 m and 0.6 m wide, respectively, founding in 'controlled' fill, medium dense or denser colluvium or stiff or stronger clayey silt may be sized for a maximum allowable bearing pressure of 100 kPa.

Settlements of approximately 10 mm to 15 mm are estimated for properly designed and constructed pad or strip footings dimensioned and supported as above. Wider footings are possible but would be subject to specific settlement assessment.

7.8 Soil and Site Assessment

The suitability of the site to accept effluent is dependent on a number of factors, including:

- the subsurface profile (soil and groundwater) within the proposed application area;
- the type and output nutrient quality of the treatment system utilised;
- the physical characteristics such as topography, landform, distances to water bodies, etc; and
- prevailing climatic conditions.

The controlling soil for on-site effluent disposal by traditional systems is likely to be the residual clayey silt due to its low permeability and poor soil structure. Based on Table 5.1 of (AS 1547, 2012), for a weakly structured Category 4 soil an indicative permeability of between 0.12 and 0.5 m/day is suggested.

Site and soil characteristics observed during the field work are assigned either a minor, moderate or major limitation depending on the restrictions to the disposal area in accordance with (AS 1547, 2012). The moderate/major limitations for effluent disposal within the site are shown below. Soil and site assessment summaries are provided in Appendix C.

Cation Exchange Capacity (CEC)

The CEC results of <1 meq% fall into the major limitation category due to the inability of these soils to hold plant nutrients.

Soil pH

Soil pH test results of 5.2 and 5.4 fall into the moderate limitation category due to non-optimal plant growth conditions.

Slope Angle

Slope angle of between 10° and 20° (approximately 20% to 40% grade) is a major limiting factor for all disposal systems due to the risk of runoff.

Landform and Site Drainage

The site topography presents a moderate risk of groundwater pollution and transport of waste offsite.

Upslope seepage

The run on and upslope seepage potential is a moderate risk due to transport of wastewater off site.

7.9 Design Effluent Loading Rates

For Category 4 soil it is recommended that the effluent design loading rates and design irrigation rates (DLR/DIR) as presented below in Table 6 be adopted, based on (AS 1547, 2012).

Table 6: Effluent Design Loading / Irrigation Rates

Disposal System	Effluent Design Loading / Irrigation Rates	
	Primary Treated Effluent	Secondary Treated Effluent
Conventional Trenches or Beds	6 to 10 mm/day	20 mm/day
Evapotranspiration/absorption (ETA/ETS) system	8 mm/day	
Irrigation System – Drip or spray	3.5 mm/day[A]	
Irrigation System – Low pressure effluent distribution (LPED)	3 mm/day	
Mound System	8 mm/day	

Notes: A requires a minimum of 150 mm of high-quality topsoil

8. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 1299 Mossman Daintree Road in accordance with DP's proposal dated 23 April 2022 and acceptance received from John Deicke dated 28 April 2022. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Office Deicke for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope of work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

9. References

AS 1547. (2012). *On-site domestic wastewater management.* Standards Australia.

AS 2870. (2011). *Residential Slabs and Footings.* Standards Australia.

AS 3798. (2007). *Guidelines on Earthworks for Commercial and Residential Developments.* Standards Australia.

AS 4678. (2002). *Earth-retaining structures.* Standards Australia.

Department of Mines and Energy. (1999). Mossman. Brisbane, QLD: Queensland Government.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w <PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w >PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈LL' (i.e. near the liquid limit).
- 'Wet' or 'w >LL' (i.e. wet of the liquid limit).

Symbols & Abbreviations

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Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

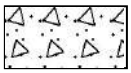
Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

Soils


Topsoil

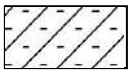

Peat


Clay

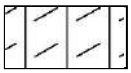

Silty clay

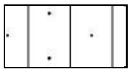

Sandy clay

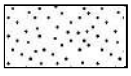

Gravelly clay


Shaly clay

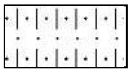

Silt

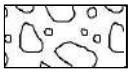

Clayey silt


Sandy silt

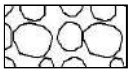

Sand

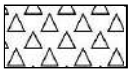

Clayey sand


Silty sand


Gravel

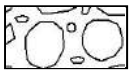

Sandy gravel


Cobbles, boulders

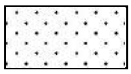

Talus

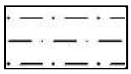
Sedimentary Rocks

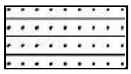

Boulder conglomerate

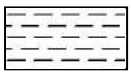

Conglomerate


Conglomeratic sandstone

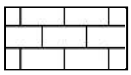

Sandstone


Siltstone

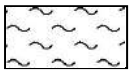

Laminite

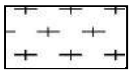

Mudstone, claystone, shale

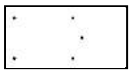

Coal


Limestone

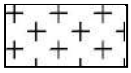
Metamorphic Rocks


Slate, phyllite, schist

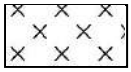

Gneiss


Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite

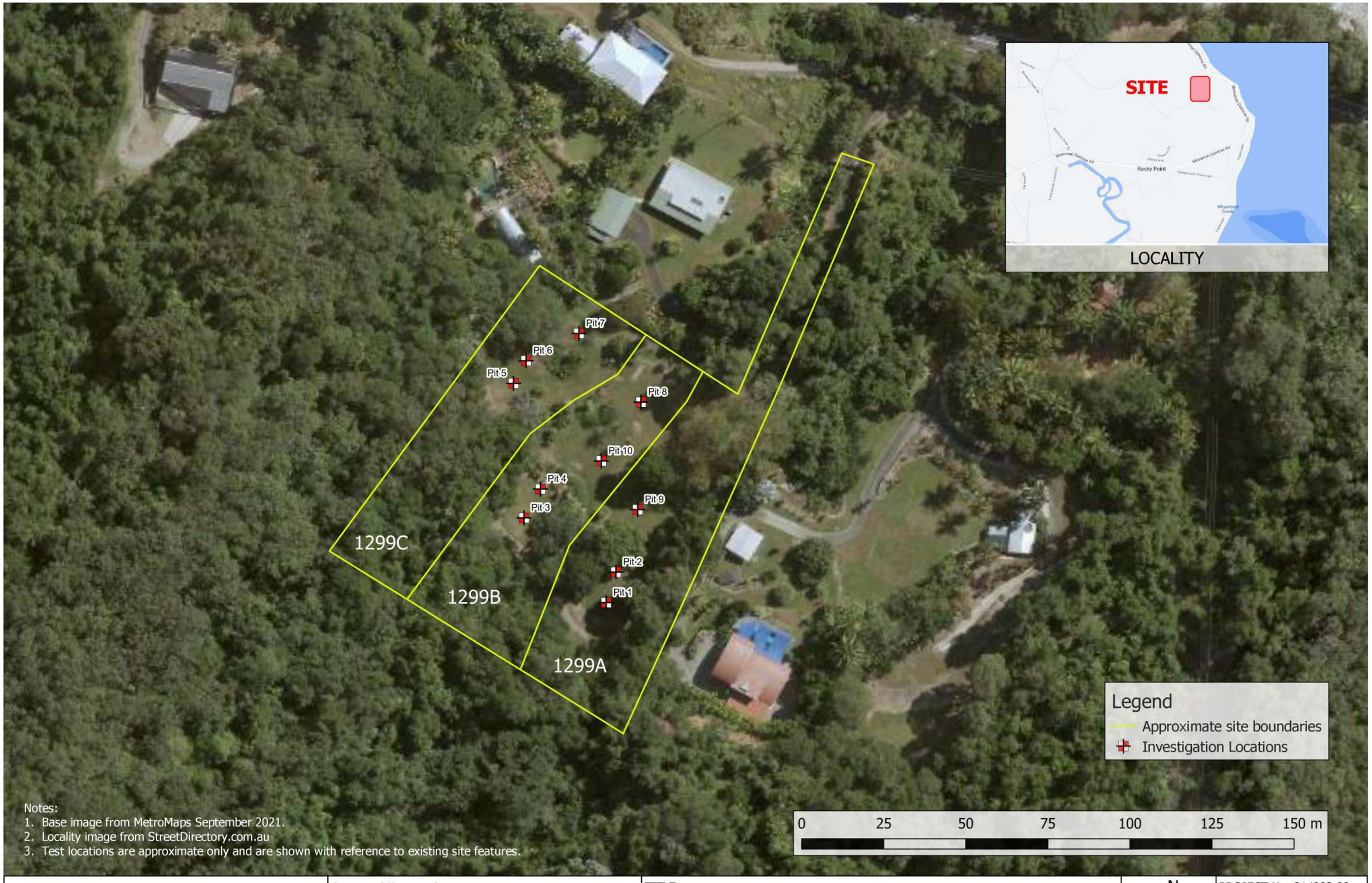

Dacite, epidote


Tuff, breccia


Porphyry

Appendix B

Drawings



Notes:
1. Base image from MetroMaps September 2021.
2. Locality image from StreetDirectory.com.au
3. Test locations are approximate only and are shown with reference to existing site features.

Douglas Partners Geotechnics · Environment · Groundwater	CLIENT: Office Deicke	TITLE: Site and Test Location Plan Proposed Residences Mossman Daintree Road, Rocky Point	N
	OFFICE: Cairns / DRAWN BY: CM		PROJECT No: 214803.00
	SCALE: As shown / DATE: June 2022		DRAWING No: 1
			REVISION: 0

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Appendix C

Table C1 - Effluent Disposal Soil Assessment Summary
Table C2 - Effluent Disposal Site Assessment Summary

Table C1 - Soil Assessment Summary

Soil Feature	Relevant System(s)	Minor Limitation	Moderate Limitation	Major Limitation	Restrictive Feature
Depth to bedrock or hardpan (m)	Surface and sub-surface irrigation	**>1.0**	0.5 – 1.0	<0.5	Restricts plant growth (trees), excessive runoff, waterlogging
	Absorption system	**>1.5**	1.0 – 1.5	<1.0	Groundwater pollution hazard. Resurfacing hazard
Depth to high episodic or seasonal water table (m)*	Surface and sub-surface irrigation	**>1.0**	0.5 – 1.0	<0.5	Groundwater pollution hazard. Resurfacing hazard
	Absorption system	**>1.5**	1.0 – 1.5	<1.0	Potential for groundwater pollution
Soil permeability Category	Surface and sub-surface irrigation	**2b, 3 and 4**	2a, 5	1 and 6	Excessive run-off, waterlogging, percolation
	Absorption system	**3 and 4**		1,2,5 and 6	
Coarse fragments (%)	All land application systems	**0-20**	20-40	>40	May restrict plant growth, affect trench installation
pH	All land application systems	>6.0	**4.5 – 6.0**	<4.5	Reduces optimum plant growth
Electrical conductivity (dS/m)	All land application systems	**<4**	4-8	>8	Excessive salt may restrict plant growth
Sodicity (exchangeable sodium percentage)[#]	Surface and sub-surface irrigation (0-0.4m)	**0-5**	5-10	>10	Potential for structural degradation
	Absorption system (0-1.2m)				
Cation exchange capacity (cmol+/kg) (0-40cm)	Surface and sub-surface irrigation	>15	5-15	**<5**	Unable to hold plant nutrients
Phosphorous sorption (kg P/ha) (0-1m for irrigation) (1 m below intended base of trench)	All land application systems	**>6000**	2000-6000	<2000	Unable to immobilise any excess P

Bold text indicates applicable limitation

** water table taken as 2.0 m below ground level*

Adapted from NSW EPA, "Environmental and Health Protection Guidelines, on-site Sewage Management for Single Households", January 1998

Table C2 - Site Assessment Summary

Site Feature	Relevant System(s)	Minor Limitation	Moderate Limitation	Major Limitation	Restrictive Feature
Flood potential	All land application systems	**Rare, above 1 in 20 year flood contour**		Frequent, below 1 in 20 year flood contour	Transport of wastewater off-site
	All treatment systems	**Vents, openings, and electrical components above 1 in 100 year flood contour**		Vents, openings, and electrical components below 1 in 100 year flood contour	Transport of wastewater off-site. System failure and electrocution hazard
Exposure	All land application systems	**High sun and wind exposure**		Low sun and wind exposure	Poor evapotranspiration
Slope %	Surface irrigation	**0-6**	6-12	**>12**	Run-off, erosion
	Sub-surface irrigation	**0-10**	10-20	**>20**	
	Absorption system	**0-10**	10-20	**>20**	
Landform	All systems	Hill crests, convex side slopes and plains	**Concave side slopes and foot slopes**	Drainage plains and incised channels	Groundwater pollution and resurfacing hazard
Run-on and upslope seepage	All land application systems	None – low	**Moderate**	High – diversion not practical	Transport of wastewater off-site
Erosion potential	All land application systems	**No signs of erosion potential present**		Signs of erosion, eg rills, mass movement and slope failure present	Soil degradation and transport, system failure
Site drainage	All land application systems	**No visible signs of surface dampness**		Visible signs of surface dampness, such as moisture-tolerant vegetation, and seepages, soaks and springs	Groundwater pollution hazard. Resurfacing hazard
Fill	All systems	**No fill**	Fill present		Subsidence. Variable permeability
Land area	All systems	**Area is available**	Area is limited	Area is not available	Health and pollution risks
Rocks and rock outcrops (% of land surface containing boulders)	All land application systems	**<10%**	10-20%	>20%	Limits system performance
Geology/ Regolith	All land application systems			Major geological discontinuities, fractured or highly porous regolith	Groundwater pollution hazard

Bold text indicates applicable limitations

Adapted from NSW EPA, "Environmental and Health Protection Guidelines, on-site Sewage Management for Single Households", January 1998

Appendix D

Field Work Results

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 38.8 m AHD
EASTING: 330539
NORTHING: 8187979

PIT No: 1
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
38	0	Silty Sandy GRAVEL GM: pale brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, loose, colluvial							
		- medium dense below 0.4 m depth		D	0.4		pp = 170		
					0.6		pp = 200		
					0.8		pp = 180		
	1				1.0		pp = 170		
37									
	2								
36									
	3								
		- boulder at 3.6 m depth							
35	3.9	Pit discontinued at 3.9m depth - limit of excavator reach							

Dynamic Penetrometer Test (blows per 100mm): 5, 10, 15, 20

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 39.6 m AHD
EASTING: 330542
NORTHING: 8187989

PIT No: 2
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
39	0.3	FILL / Silty Sandy GRAVEL: dark brown and pale brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, trace rootlet, moist, medium dense							
				D	0.5		pp = 150		
					0.6		pp = 140		
					0.9		pp = 100		
38	1.2	Silty Sandy GRAVEL: pale brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense, colluvial							
		- very dense below 2.2 m		D	2.5				
37	3.0	Pit discontinued at 3.0m depth							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 38.8 m AHD
EASTING: 330514
NORTHING: 8188005

PIT No: 3
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
38	0.2	Clayey SILT ML / SILTSTONE HW: Approximately 50% pale brown, low plasticity, w<PL, hard (extremely weathered Argillite) and 50% pale brown, very low strength, highly weathered siltstone		D	0.2		pp >600		5 10 15 20
	0.3				0.3		pp >600		
	0.4				0.4		pp >600		
	0.6				0.6		pp >600		
	0.8				0.8		pp >600		
1									1
	1.5								
	1.7	SILTSTONE HW: brown and grey, very low-low strength, Hodgkinsons Formation		D	1.6				
		Pit discontinued at 1.7m depth - refusal on very low strength siltstone							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 38.6 m AHD
EASTING: 330519
NORTHING: 8188014

PIT No: 4
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
38	0	FILL / Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense		D	0.2		pp = 180		
					0.4		pp = 150		
					0.5				
					0.6		pp = 100		
					0.8		pp = 90		
37	2.2	Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense, colluvial		D	3.0				
35	3.7	Pit discontinued at 3.7m depth - limit of excavator reach							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 36.6 m AHD
EASTING: 330511
NORTHING: 8188046

PIT No: 5
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
36	0.5	Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense, colluvial		D	0.4				
					0.5		pp >600		
		Clayey SILT ML: brown, low plasticity, trace sand and gravel, w<PL, hard, extremely weathered Hodgkinsons Formation			0.6		pp >600		
	1				0.9		pp >600		
				D	1.0				
35	1.4	SILTSTONE HW: brown and grey, very low strength							
	2	2.0 Pit discontinued at 2.0m depth - refusal on very low strength siltstone							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Dynamic penetrometer test completed at ground surface, and reattempted at 1.1 m depth

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
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TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 36.4 m AHD
EASTING: 330515
NORTHING: 8188054

PIT No: 6
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
36	0.0	FILL / Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense		D	0.5		pp range from 100-200 kPa in top 1.0 m depth		
35	1				1.0				
34	2	Clayey SILT ML: brown, low plasticity, trace sand and gravel, trace cobble, w<PL, very stiff, residual							
	3			D	3.0				
	3.2	Pit discontinued at 3.2m depth - refusal on very low strength siltstone							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 31 m AHD
EASTING: 3305314
NORTHING: 8188062

PIT No: 7
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
31	0.2	Topsoil / Clayey SILT ML: dark brown, low plasticity, with organics (rootlets), trace sand and gravel, w~PL, firm		D	0.1		pp = 100		
		Clayey SILT ML: brown, low plasticity, with subrounded and subangular sand and gravel, w<PL, stiff, colluvial		D	0.3 0.4 0.5		pp = 180 pp = 220		
30	1				0.7		pp = 190		1
					0.9		pp = 200		
	1.5	Silty CLAY CI: red brown, medium plasticity, trace sand and gravel, very stiff, possibly residual		D	1.7				
29	2 2.0	Pit discontinued at 2.0m depth							2

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 32 m AHD
EASTING: 330550
NORTHING: 8188041

PIT No: 8
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
32	0.2	Topsoil / Clayey SILT ML: dark brown, low plasticity, with organics (rootlets), trace sand and gravel, w~PL, stiff							
		Clayey SILT ML: brown, low plasticity, with subangular and subrounded sand and gravel, trace cobble, w~PL, stiff, colluvial		D	0.3		pp = 180		
		- becoming w>PL below 0.4 m depth			0.6		pp = 200		
31	1				0.9		pp = 190		
				D	1.0				
		- very stiff grading to hard below 1.4 m depth							
				D	1.8				
30	2								
				D	2.5				
29	3	3.0 Pit discontinued at 3.0m depth							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 35 m AHD
EASTING: 330549
NORTHING: 8188008

PIT No: 9
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
35	0.2	Topsoil / Clayey SILT ML: dark brown, low plasticity, with organics (rootlets), trace sand and gravel, w>PL, firm to stiff			0.3		pp = 220		
		Clayey SILT ML: brown, low plasticity, trace subrounded and subangular sand and gravel, trace cobble, w>PL, stiff, colluvial		D	0.5 0.6		pp = 190		
34	1				0.9		pp = 240		
		- with subrounded to subangular sand and gravel and subangular to subrounded cobble, below 1.1 m depth		D	1.0				
33	2	- hard below 1.9 m depth							
32	3								
	3.9	Pit discontinued at 3.9m depth - limit of excavator reach							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Dynamic penetrometer test completed at ground surface, and reattempted at 1.0 m depth

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 34 m AHD
EASTING: 330538
NORTHING: 8188023

PIT No: 10
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
34	0.15	Topsoil Clayey / SILT ML: dark brown, low plasticity, with sand and gravel, with organics (rootlets) w>PL, firm to stiff							
		Clayey SILT ML: brown, low plasticity, with subangular to subrounded sand and gravel, trace cobble, w=PL, stiff, colluvial			0.3		pp = 150		
				D	0.5				
					0.6		pp = 200		
		- w>PL below 0.8 m depth			0.9		pp = 150		
33	1			D	1.0				1
				D	1.5				
		- hard below 1.7 m depth							
32	2								2
				D	2.5				
	2.7	Pit discontinued at 2.7m depth							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Appendix E

Laboratory Test Results

Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
Phone: (07) 4779 9866
Email: Townsville@douglaspartners.com.au

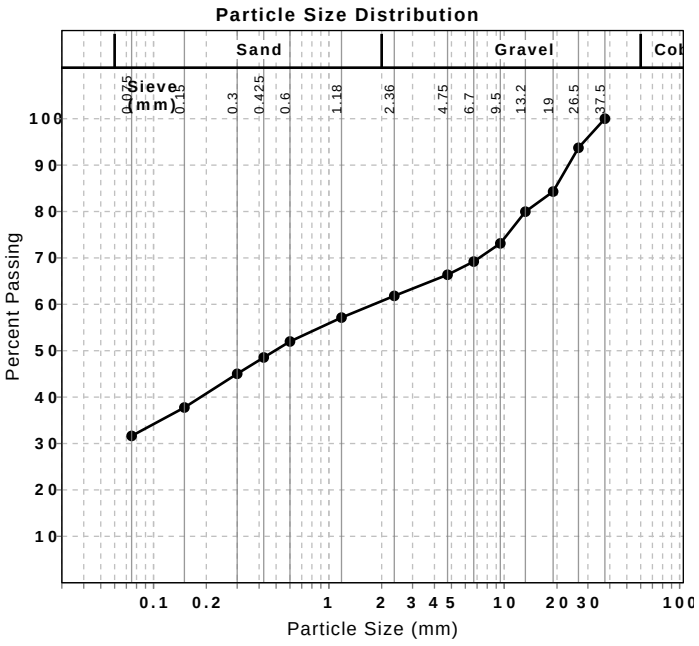
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777A
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 16/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 1 , Depth: 0.4**
Material: Soil & Cobble

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
37.5 mm	**100**		
26.5 mm	**94**		
19 mm	**84**		
13.2 mm	**80**		
9.5 mm	**73**		
6.7 mm	**69**		
4.75 mm	**66**		
2.36 mm	**62**		
1.18 mm	**57**		
0.6 mm	**52**		
0.425 mm	**49**		
0.3 mm	**45**		
0.15 mm	**38**		
0.075 mm	**32**		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	14.1



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
Phone: (07) 4779 9866
Email: Townsville@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

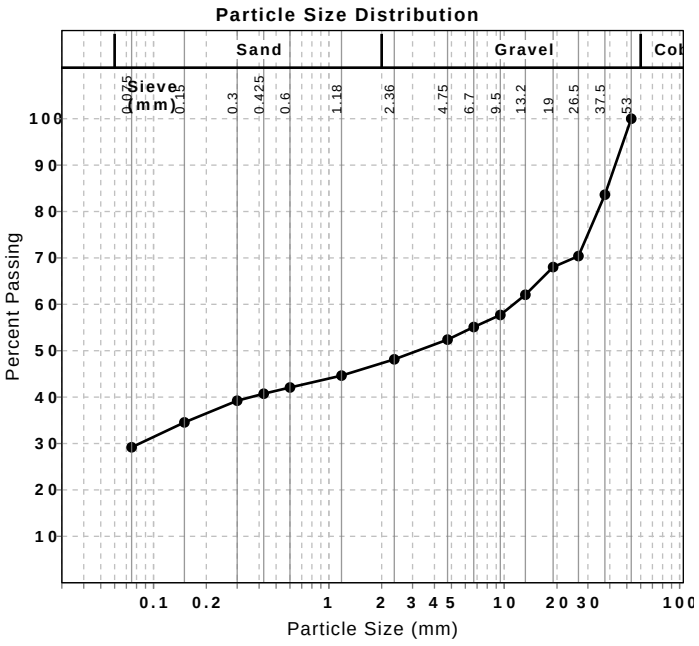
Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777B
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 16/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 4 , Depth: 0.5**
Material: Soil & Cobble

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
53 mm	**100**		
37.5 mm	**84**		
26.5 mm	**70**		
19 mm	**68**		
13.2 mm	**62**		
9.5 mm	**58**		
6.7 mm	**55**		
4.75 mm	**52**		
2.36 mm	**48**		
1.18 mm	**45**		
0.6 mm	**42**		
0.425 mm	**41**		
0.3 mm	**39**		
0.15 mm	**35**		
0.075 mm	**29**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	28		
Plastic Limit (%)	23		
Plasticity Index (%)	**5**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	3.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	18.1



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
Phone: (07) 4779 9866
Email: Townsville@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777C
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 16/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 5 , Depth: 1.0**
Material: Clayey Silt

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	34		
Plastic Limit (%)	23		
Plasticity Index (%)	**11**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	4.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	18.0

Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
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Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777D
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 13/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 8 , Depth: 0.3**
Material: Clayey Silt

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	24		
Plastic Limit (%)	19		
Plasticity Index (%)	**5**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	2.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	14.7

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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 294891

Client Details

Client	Douglas Partners (Cairns) Pty Ltd
Attention	Aidan McDonald
Address	13 Industrial Ave, Stratford, QLD, 4870

Sample Details

Your Reference	**214803.00 Rocky Point, Proposed Residences**
Number of Samples	3 Soil
Date samples received	06/05/2022
Date completed instructions received	06/05/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

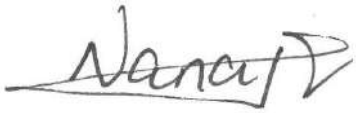
Date results requested by	16/05/2022
Date of Issue	16/05/2022

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager

Authorised By



Nancy Zhang, Laboratory Manager

Misc Inorg - Soil				
Our Reference		294891-1	294891-2	294891-3
Your Reference	UNITS	Pit 7	Pit 9	Pit 10
Depth		1.7	1.5	1
Date Sampled		04/05/2022	04/05/2022	04/05/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	12/05/2022	12/05/2022	12/05/2022
Date analysed	-	12/05/2022	12/05/2022	12/05/2022
pH 1:5 soil:water	pH Units	5.2	5.2	5.4
Electrical Conductivity 1:5 soil:water	µS/cm	48	51	45
Total Nitrogen in Soil	mg/kg	170	180	270
Sodium Adsorption Ratio		1.2	1.8	0.56
Emerson Class No.	-	5.0	6.0	5.0
Phosphorus Sorption Capacity	mg/kg	670	560	530

ESP/CEC				
Our Reference		294891-1	294891-2	294891-3
Your Reference	UNITS	Pit 7	Pit 9	Pit 10
Depth		1.7	1.5	1
Date Sampled		04/05/2022	04/05/2022	04/05/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	12/05/2022	12/05/2022	12/05/2022
Date analysed	-	13/05/2022	13/05/2022	13/05/2022
Exchangeable Ca	meq/100g	0.2	0.1	0.5
Exchangeable K	meq/100g	<0.1	<0.1	<0.1
Exchangeable Mg	meq/100g	0.1	<0.1	0.2
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	<1	<1	<1
ESP	%	<1	<1	<1

Method ID	Methodology Summary
Ext-037	Analysed by Sydney Environmental & Soil Laboratory
Ext-062	Analysed by East West Enviroag
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-020	Calcium and Magnesium analysed by ICP-AES and SAR calculated.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			12/05/2022	1	12/05/2022	12/05/2022		12/05/2022	[NT]
Date analysed	-			12/05/2022	1	12/05/2022	12/05/2022		12/05/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	5.2	5.1	2	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	48	39	21	104	[NT]
Total Nitrogen in Soil	mg/kg	10	INORG-127	<10	1	170	170	0	92	[NT]
Sodium Adsorption Ratio		0.01	Metals-020	<0.01	1	1.2	[NT]		113	[NT]
Emerson Class No.	-	0	Ext-037	[NT]	1	5.0	[NT]		[NT]	[NT]
Phosphorus Sorption Capacity	mg/kg	na	Ext-062	[NT]	1	670	[NT]		[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			12/05/2022	[NT]	[NT]	[NT]	[NT]	12/05/2022	[NT]
Date analysed	-			13/05/2022	[NT]	[NT]	[NT]	[NT]	13/05/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
ESP	%	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Emerson Class No. & Phosphorus Sorption Capacity analysed by East West Geo Ag Enviro. Report No. EW220977

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ENGINEERS

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ONSITE & SOIL EVALUATION FOR EFFLUENT DISPOSAL

FOR

PROPOSED RESIDENCES MOSSMAN-DAINTREE ROAD ROCKY POINT

Prepared for: **Office Deicke**

Project no: **BR220116**

Date: **24th June 2022**

Revision: **02**

Revisions

Date	Issue	Revision Description	Prepared By	Reviewed By	Approved By
22.06.22	01	Draft Issue	David Colmer	Karl Paton	David Colmer
24.06.22	02	Final Issue	David Colmer	Karl Paton	David Colmer

It is the responsibility of the reader to verify the currency of the version number of this report. All subsequent releases will be made directly to the Client.

TABLE OF CONTENTS

1 INTRODUCTION

ACOR Consultants have been engaged by Office Deicke to prepare an On-site and Soil Evaluation (OSE) for the purposes of effluent disposal on an unsewered property at 1299 Mossman-Daintree Road, Rocky Point.

This OSE addresses management of disposal of effluent generated from the domestic waste stream from three (3) individual residences located on three (3) separate but adjoining allotments in accordance with the "Queensland Plumbing and Wastewater Code" and AS/NZS 1547:2012 "On-site domestic-wastewater management".

2 PROPOSED DEVELOPMENT

The project comprises construction of three (3) individual residences located on three (3) separate but adjoining allotments Lot 2, Lot 3 and Lot 4 of the subdivided property at 1299 Mossman Daintree Road. Each residence to be two storey and constructed on the existing building platforms provisioned when the property was subdivided.

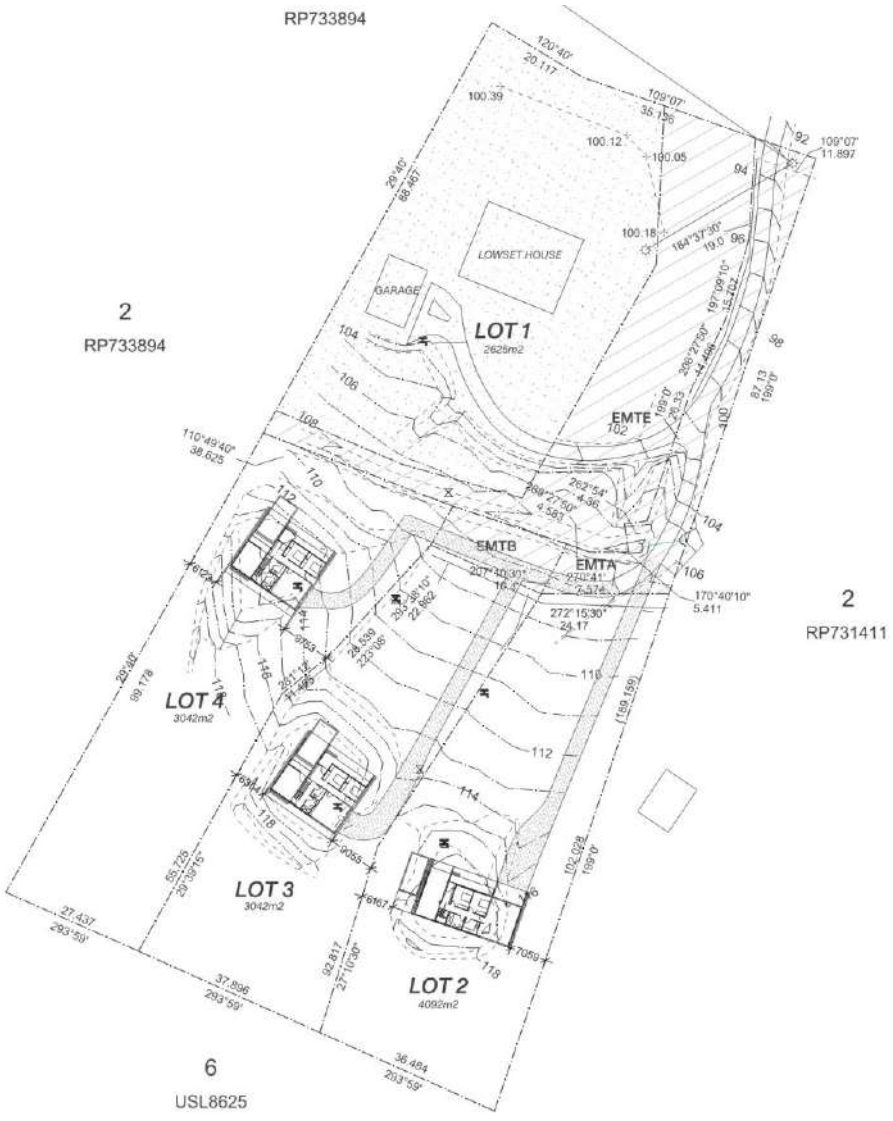


Figure 2.1 – Proposed Site Locality

3 SITE INVESTIGATION

A site and soil investigation was undertaken on 4 May 2022 by Douglas and Partners. The investigation included the excavation of ten test pits and laboratory testing of selected samples. The details of the field and laboratory work are presented in Appendix B – Geotechnical Report.

The investigation assessed the subsurface soil and groundwater conditions to provide:

- site classification to AS 2870 (2011)
- allocation of soil categories and determination of design soil permeability and design effluent loading rates based on AS 1547 (2012)

3.1 Location & Site Description

Street Address	-	1299A, 1299B and 1299C Mossman-Daintree Road, Rocky Point QLD 4874.
Site Area	-	Lot 2 3745m2
		Lot 3 3309m2
		Lot 4 3042m2
Local Authority	-	Douglas Shire Council
Existing Land Use		Vacant (part of a recently completed subdivision)

3.2 Topography & Features

A site survey is presented in Appendix A – Site Survey Plan, including contours and levels over the site.

The site comprises three adjoining allotments within a battle-axe area above an existing residence (refer Appendix A - Site Survey Plan). Each individual lot is approximately rectangular in shape.

The entire site (3 lots) is situated on the north-eastern facing foot slopes of the Dagmar Range and site elevations approximately range from 35 AHD to 55 AHD.

The southwestern portion of the site (approximately 25%) comprises steeply sloping hillside vegetated by dense rainforest. Previous earthworks have been undertaken to prepare a building platform at each of the three allotments using localised cut and filling. The natural slope gradients downhill from each building platform at a range of between 10° to 15°.

An open unlined drain has been excavated along much of the site's eastern boundary along the driveway, presumably to divert overland flows down to the road reserve.

Deeply eroded ephemeral water courses / surface drains were observed to the east and north of site indicating the likelihood of significant overland flows during and following significant rainfall events.

The site is bordered by residential properties downhill to the north, to the east and to the west, and steeply sloping, densely vegetated slopes uphill to the south.

3.3 Vegetation

The southwestern portion of the site (approximately 25%) comprises steeply sloping hillside vegetated by dense rainforest.

The main portion of the site, below the south-western steep slopes, has been cleared of native vegetation and is generally vegetated by short grass with several large trees and shrubs around the building platforms.

3.4 Soils

Subsurface conditions may be grouped into two areas for discussion, the Modified Areas or building platforms and the Natural Areas downslope of the building platforms.

- Modified Areas: Fill comprising medium dense clayey sandy gravel was encountered to depths of between 1.2 m and 2.2 m at the building platforms. Natural materials encountered within the building platform test locations are broadly characterised by colluvial clayey or silty sandy gravel with cobbles (generally assessed to be medium dense or denser).
- Natural Areas: The downslope hillside test locations generally comprised a shallow (0.15 m or 0.2 m thick) layer of firm or stronger clayey silt topsoil overlying stiff or stronger clayey silt.

The Geotechnical Report states that the controlling soil for on-site effluent disposal by traditional systems is likely to be the residual clayey silt due to its low permeability and poor soil structure. Based on Table 5.1 of (AS 1547, 2012), for a weakly structured Category 4 soil an indicative permeability of between 0.12 and 0.5 m/day is suggested.

Free groundwater was not observed in any of the test pits.

4 WASTEWATER SOURCES AND QUANTITY

Wastewater generated from the proposed development is anticipated to be of a domestic nature only. Tradewaste discharge (such as oils, paints, etc) is not expected to be generated from any residence. The owners are to consult with the manufacturer of the wastewater treatment plant to ensure that any waste disposed of to the sewer system is capable of being treated by the plant.

Domestic wastewater flow design allowances for each proposed residence are presented below table in accordance with AS:1547 (2012) Table H1 and equivalent Queensland Plumbing and Wastewater Code Table T2.

Table 4.1 – Domestic Wastewater Flow Design Allowance

Source	Number of Persons	Total Flow (l/person/day)
3 Bedroom Residence	4	600

5 WASTEWATER TREATMENT AND DISPOSAL

5.1 Site Factors

The following factors are identified as those that will govern the level of effluent treatment and the land application system type (Absorption Beds and Trenches, Evapotranspiration Area, Mounds, Subsoil Drip Irrigation and Surface Irrigation).

5.1.1 Soil Category

The soil category for this site is category 4 and comprised a shallow layer of firm clayey topsoil with low permeability. Mounds are suitable for this application.

5.1.2 Setback distances

A 10m offset distance is required from the intermittent water course found on the site provided advanced secondary treatment sewage plant is used. This distance increases for sewage treatment plants that discharge a lower quality effluent.

5.1.3 Vegetation

The main portion of the site, below the south-western steep slopes, has mostly been cleared of native vegetation and is generally vegetated by short grass with several large trees and shrubs around the building platforms. There are significant large trees that will cast shadow over the available areas for effluent application.

5.1.4 Slope gradient

Most of the proposed effluent disposal area is moderately sloped at 10-15%. Although Subsoil Drip Irrigation is most suitable for this application (up to 30°), Mounds are also suitable up to 15°.

5.1.5 Land availability

Due to the steep slope and vegetation at the rear of the sites the land available for land application will be limited. This is further limited by the siting of the building pad for Lot 4. Mound beds with a smaller footprint will be the preferred option for effluent disposal.

5.1.6 Climate factors

The site is in a wet climate. Mounds are preferred in this instance.

5.2 Proposed Pre-Treatment

Water reduction facilities are recommended to be installed to all fixtures discharging to the wastewater treatment plant. Note that water reduction facilities will be required under Queensland Development Code MP4.1 – Sustainable Buildings and include installation of 3 star WELS water saving shower roses, 4 Star WELS dual flush (3/4.5 litre) flush toilets, and 3 Star WELS tapware to all other fixtures at minimum. The owners can elect to use further reduction facilities such as front load washing machines, higher WELS rated tapware, and aerator faucets to further reduce hydraulic loading.

5.3 Proposed Treatment

To ensure that horizontal separation distances are minimised, and the land application area can adequately fit on the site, it is proposed to utilise a proprietary treatment plant capable of achieving effluent to an advanced secondary standard.

The owners are to ensure the treatment plant selected is approved by the Local Authority and has Chief Executive Approval under the Queensland Plumbing and Wastewater Code.

A maintenance agreement between the property owners and the manufacturer of the treatment plant, or authorized service agent, is to be entered into to ensure the continued proper operation of the treatment plant and that it complies with the secondary effluent compliance criteria in accordance with the Queensland Plumbing and Wastewater Code Appendix 1 (and below).

Table 5.1 – Advanced Secondary Effluent Compliance Criteria

Parameter	Level
Biochemical Oxygen Demand (BOD_5)	90% of samples taken over test period must have a BOD_5 less than 10g/m^3 with no sample greater than 20g/m^3
Total Suspended Solids (TSS)	90% of samples taken over test period must have a BOD_5 less than 30g/m^3 with no sample greater than 20g/m^3
Thermotolerant Coliform (org/100mL)	90% of samples taken over test period must have a thermotolerant coliform count not exceeding 10 organisms per 100mL with no sample exceeding 200 organisms per 100mL.
Chlorination	Where chlorination is used the total chlorination must be greater than or equal to 0.5g/m^3 and less than 2.0g/m^3 in four

	out of five sample taken.

5.4 Proposed Land Application Area

Mounds are proposed to be provided for disbursement of the (treated) advanced secondary effluent. The northern portion of each site has been adopted as the location of the land application area.

The required irrigation area is 171m2 which has been calculated from recommended design irrigation rates in Table 4.2A4 of AS/NZS 1547:2012. Refer to Appendix F for calculations and assumptions. A reserve area of 171m2, representing 100% of the design area, can be accommodated on the site and is to be used for resting of the land-application system, if required, or for duplication of the land application system due to unforeseen circumstances.

The area set aside for subsurface irrigation shall be prepared in accordance with AS/NZS 1547:2012 Appendix M. Refer to Appendix B for a copy of the Effluent Disposal Plan, which provides a layout and details of the effluent disposal areas to ensure compliance with AS/NZS 1547:2012. There are proposed to be two irrigation zones for each allotment where an automatic distribution valve alternates irrigation between these areas. This allows for drying out of each area between irrigation events, rather than having a constantly wet area that gets dosed every irrigation event.

The irrigation area shall be planted to ensure the uptake of nutrients and to promote evapotranspiration. Australian natives are typically adversely affected if exposed to regular periods of effluent irrigation and a local nursery should be consulted for types and species of plants suitable for the land application area. The owner is to ensure that any trees planted near the irrigation areas do not cast excessive shade of the irrigation area when mature.

Diversion drains and/or cut off drains are to be installed upslope of all irrigation areas to direct stormwater runoff around the irrigation area. This will also aid in delineating the land application area. Warning signs complying with AS/NZS:1319 at the boundaries of the irrigation area, in at least two places, clearly visible to the occupants with wording such as “Recycled Water – Avoid Contact – DO NOT DRINK” are to be installed.

5.5 Separation Distances

The subsurface land application area shall have minimum separation distances as specified in Table T4 and T7 of the Queensland Plumbing and Wastewater Code. Refer to Table 5.2 and Table 5.3 below which reproduces these required separation distances.

Table 5.2 – Setback Distances for Subsurface Land Application Area

Feature	**Horizontal Separation Distance (metres)**		
	Up slope	**Down slope**	**Level**
Property boundaries, pedestrian paths, walkways, recreation areas, retaining wall, and footings for buildings and other structures.	2	4	2
Inground swimming pools	6	6	6
Inground potable water tank not exposed to primary effluent	6	6	6

Inground potable water tank exposed to primary effluent	15	15	15

(Ref: Table T4 Queensland Plumbing and Wastewater Code)

Table 5.3 – Setback Distances for On-site Sewerage Facilities – Protection of Surface Water and Groundwater

Feature	**Horizontal Separation Distance (metres)**
	Advanced Secondary
Top of bank of permanent water course	10
Top of bank of intermittent water course	
Top of bank of a lake, bay or estuary	
Top water level of a surface water source used for agriculture, aquaculture or stock purposes	
Open stormwater drainage channel or drain	
Bore or a dam	
Unsaturated soil depth to a permanent water table (vertically)	0.3

(Ref: Table T7 Queensland Plumbing and Wastewater Code)

Refer to Appendix B for a copy of the Effluent Disposal Plan, which provide separation distances on the site plan to ensure compliance with the Queensland Plumbing and Wastewater Code.

6 OPERATION AND MAINTENANCE

It is the responsibility of the property owner to ensure the effluent generated does not cause nuisance via seepage, runoff, drift, or spray to adjoin properties or water courses

The property owner is responsible for the operation and maintenance of the installation. This includes engaging an authorized service agent to maintain the facility at appropriate service intervals.

The wastewater treatment plant is to be installed and operated in accordance with the manufacturer's specifications, instructions, and recommendations.

The surface irrigated land application area shall be maintained by the property owner to ensure maximum uptake of nutrients and evapotranspiration. This will include mowing of grassed areas, pruning of all plants as required, weeding and replacement of dead plants as required.

Irrigation of food crops with secondary treated effluent shall not occur.

7 CONCLUSION

Based on the architectural plans presented in Appendix D, the wastewater generated from the proposed 3x residences will be capable of being disposed of on-site in a safe manner in accordance with the Queensland Plumbing and Wastewater Code and AS:1547 (2012).

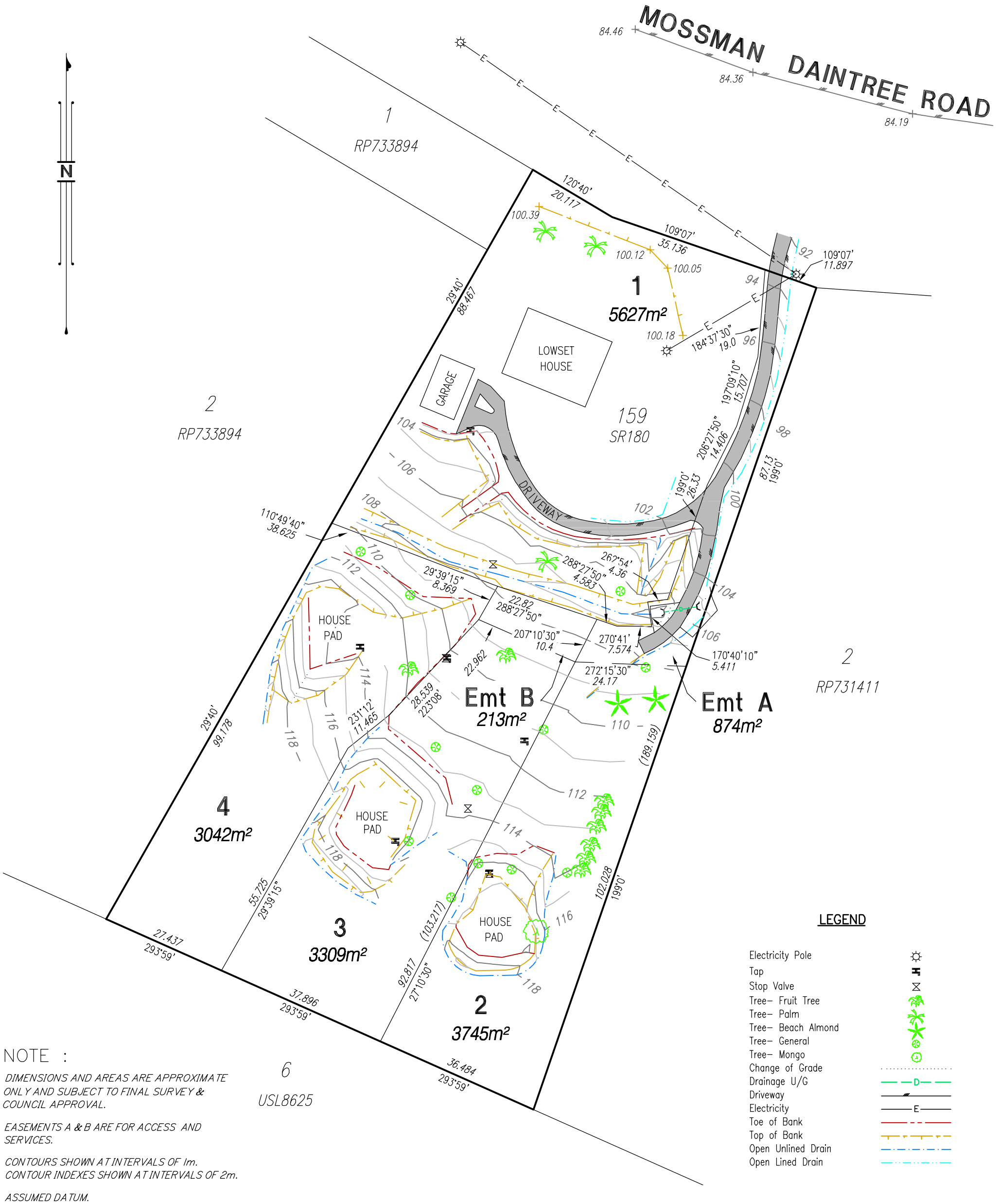
An Effluent Disposal Plan has been prepared and presented in Appendix C to ensure compliance.

If the land application system is not located in accordance with these plans, or if any alterations are made to the Architectural plans presented in Appendix D, or any other alterations occur that may alter the effectiveness of the management of land application system, then ACOR Consultants are to be notified so appropriate advice and suitable amendments to the design and documentation can be completed and re-submitted to the local authority if required.

8 REFERENCES

- AS/NZS 1547:2012 - Onsite domestic-waste water management, Australia/New Zealand Standard.
- Queensland Plumbing and Wastewater Code, Queensland Government, 26 March 2019.
- MP4.1 – Sustainable Buildings, Queensland Development Code, Queensland Government, 17 September 2020.
- FNQROC Development Manual, Design Manual D7, Version 11/19, Far North Queensland Regional Organisation of Council, November 2019

Appendix A – Site Survey Plan



NOTE :

DIMENSIONS AND AREAS ARE APPROXIMATE ONLY AND SUBJECT TO FINAL SURVEY & COUNCIL APPROVAL.

EASEMENTS A & B ARE FOR ACCESS AND SERVICES.

CONTOURS SHOWN AT INTERVALS OF 1m.
CONTOUR INDEXES SHOWN AT INTERVALS OF 2m.

ASSUMED DATUM.

LEGEND

- Electricity Pole
- Tap
- Stop Valve
- Tree– Fruit Tree
- Tree– Palm
- Tree– Beach Almond
- Tree– General
- Tree– Mongo
- Change of Grade
- Drainage U/G
- Driveway
- Electricity
- Toe of Bank
- Top of Bank
- Open Unlined Drain
- Open Lined Drain

AMENDMENT A: 03–03–2008
ADDED EDGE OF ROAD AND TOP OF BANK TO THE NORTHERN END OF THE 62493–1.

0 8 16 24 32 40
metres

SCALE 1:800 IS APPLICABLE ONLY TO THE ORIGINAL SHEET SIZE. (A3)

PROJECT MANAGER/SURVEYOR	A.SOLOMON
CHECKED	
DRAWN	JMG 15/10/07
DRAFTING CHECKED	
CAD	62493-1.dwg
DESIGNED	
SURVEYED	AJS 18/09/07
FIELD BK.	1141
LEVEL DATUM	Assumed
SHEET SIZE	A3
SHEET OF SHEETS	1 OF 1
SCALE	1:800

L & M COCKRELL

Proposed Reconfiguration of Lot 159 on SR180
Plan of Lots 1-4 & Easement A in Lot 2 & Easement B in Lot 3

AMENDED	ISSUE	DRAWING NO.
03-03-2008	A	62493-1

CONICS
DESIGN : PLANNING : SURVEYING
ECONOMICS + ADVISORY

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Appendix B – Geotechnical Report

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Geotechnical Investigation

Proposed Residences
Mossman Daintree Road, Rocky Point

Prepared for
Office Deicke

Project 214803.00
June 2022

Douglas Partners
Geotechnics / Environment / Groundwater

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
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Report on Geotechnical Investigation
Proposed Residences
Mossman Daintree Road, Rocky Point

1. Introduction

This report presents the results of geotechnical investigation undertaken by Douglas Partners Pty Ltd (DP) for three proposed residential dwellings at Mossman Daintree Road, Rocky Point. The investigation was commissioned in an email dated 28 April 2022 by Mr John Deicke of Office Deicke and was undertaken in accordance with DP proposal 214803.00.P.001.Rev0 dated 23 April 2022.

It is understood that the project includes the construction of three residential dwellings on separate but adjoining allotments of the subdivided 1299 Mossman Daintree Road.

The aim of the investigation was to assess the subsurface soil and groundwater conditions at the field test locations to provide:

- site classification to AS 2870 (2011);
- excavation conditions and suitable temporary and permanent batter slopes;
- site preparation earthworks and suitability of site won materials for re-use as engineered fill;
- geotechnical retaining wall design parameters;
- footing options and footing design parameters; and
- allocation of soil categories and determination of design soil permeability and design effluent loading rates based on AS 1547 (2012).

Slope risk assessment was excluded from the requested scope of work.

The investigation included the excavation of ten test pits and laboratory testing of selected samples. The details of the field and laboratory work are presented in this report, together with comments and recommendations on the items listed above.

This report must be read in conjunction with the notes entitled 'About This Report' in Appendix A and other explanatory notes, and should be kept in its entirety without separation of individual pages or sections.

2. Proposed Development

DP was supplied with a preliminary site plan (Drawing SD_A01_0101 dated 4 February 2022) for the purposes of investigation planning which is included in Appendix B for ease of reference. This plan indicated the proposed development to comprise the construction of three, two-level residential dwellings on the existing building platforms. It is assumed the buildings will be constructed using lightweight materials, elevated above ground and supported by steel posts.

3. Site Description

The site (designated as 1299A to 1299C Mossman Daintree Road) comprises three adjoining allotments within a battle-axe area above an existing residence (refer Drawing 1 in Appendix B and Figure 1 below). Each lot is approximately rectangular in shape, and comprising an area of 3042 m^2 (Lots 3 and 4) or 4092 m^2 (Lot 2). For the purposes of this report, 'site' refers to the combined area of the three allotments.

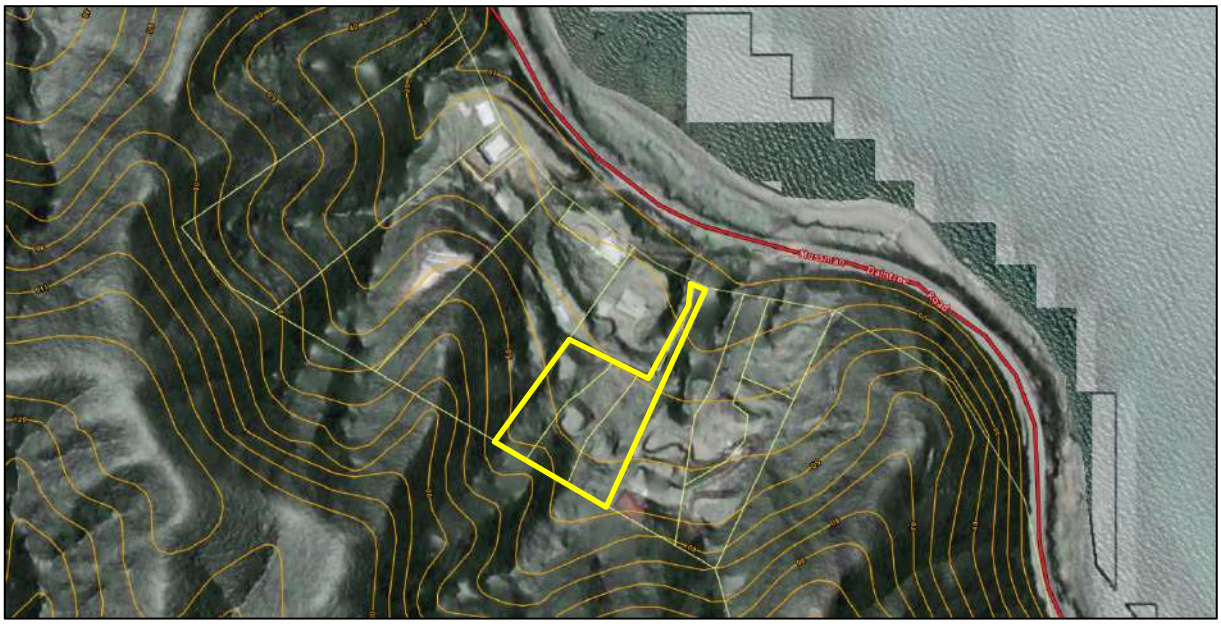

Figure 1: Qld Globe image showing site location in yellow outline.

The site is situated on the north-eastern facing foot slopes of the Dagmar Range and site elevations approximately range from 35 AHD to 55 AHD. Much of the southwestern portion of the site (approximately 25%) comprises steeply sloping hillside vegetated by dense rainforest.

Previous earthworks are evident on site including the preparation of building platforms using 'cut to fill' methodology, and an open unlined drain has been excavated along much of the site's eastern boundary, presumably to divert overland flows down to the road reserve. No structures were observed within site boundaries and other than that for the above earthworks, it appears that no previous site development has occurred.

The main portion of the site, below the south-western steep slopes, has mostly been cleared of native vegetation and is generally vegetated by short grass with several large trees and shrubs present mostly around the building platforms (refer Figures 2 to 5). The terrain in the cleared portions is generally uneven and hummocky, and the building platforms appear to have been created by localised cutting and filling. The natural slope gradients downhill of the of the building platforms generally range between 10° to 15°(ie 'moderately' sloping).

The site is bordered by residential properties downhill to the north, east and west, and steeply sloping, densely vegetated slopes uphill to the south.

Figure 2: Showing general site conditions. Photo is from the end of the shared driveway with a view towards the southwest.

Figure 3: View looking northeast showing the building platform at 1299A.

Figure 4: View looking northeast showing the building platform at 1299B.

Figure 5: View looking west showing the building platform at 1299C.

4. Geology

Reference to the Mossman 1:100,000 Geological Series Sheet (Department of Mines and Energy, 1999) indicates that the site is underlain by Hodgkinson Formation bedrock typically comprising siltstone and fine to coarse grained arenite, and residual soils thereof.

Investigation findings are generally consistent with the published findings however colluvial materials were commonly encountered, generally overlying residual soils in the majority of the test locations.

5. Field Work

5.1 Methods

The field work was completed on 4 May 2022 and comprised the excavation of ten test pits, designated as Pits 1 to 10, to depths ranging from 1.7 m to 3.9 m. Approximate test locations are shown on Drawing 1 in Appendix B.

The pits were excavated using a 5.5 tonne excavator. Strata identification was through observation of excavated spoil, and soil samples were taken at regular depth intervals for laboratory testing. Pocket penetrometer readings were taken in the walls of the pits and dynamic cone penetrometer (DCP) tests were undertaken alongside the pits to provide additional information for assessment of soil strength consistency. On completion of excavation, the pits were backfilled with excavated spoil in layers which were nominally compacted using the back of the excavator bucket. Any excess spoil was mounded and track rolled at the surface.

The field work was carried out in the presence of a DP engineering geologist.

A differential GPS unit was used to record UTM co-ordinates to GDA94. Surface levels were extrapolated from a supplied contour drawing. The co-ordinates and surface levels are presented on the test pit logs in Appendix D.

5.2 Results

The subsurface conditions encountered in the pits are detailed on the logs in Appendix D. Notes defining the sampling methods, soil descriptions, and symbols and abbreviations used in their preparation are given in Appendix A.

Subsurface conditions may be grouped into two areas for discussion, the building platform (ie modified) areas and downslope (ie natural) areas.

Fill, comprising medium dense clayey sandy gravel (similar to the naturally occurring colluvium encountered elsewhere on site) was encountered in Pits 2, 4 and 6 to depths of between 1.2 m and 2.2 m.

Natural materials encountered within the majority of the building platform test locations, either below the fill or from the surface (refer Pits 1, 2 and 4 to 6) are broadly characterised by colluvial clayey or silty

sandy gravel with cobbles (generally assessed to be medium dense or denser), underlain in Pits 5 and 6 by stiff or stronger residual clayey silt, transitioning to weathered siltstone within which virtual excavator refusal occurred on probable very low strength or stronger rock. Colluvium was not encountered in Pit 3, which encountered hard, residual clayey silt to 1.5 m depth, overlying siltstone to virtual excavator refusal at 1.7 m depth.

Within the downslope hillside test locations (refer Pits 7 to 10), ground conditions generally comprised a shallow (0.15 m or 0.2 m thick) layer of firm or stronger clayey silt topsoil overlying stiff or stronger clayey silt. The exception to this generalised profile description was the presence of very stiff silty clay encountered below 1.5 m depth in Pit 7, to the limit of investigation.

Free groundwater was not observed in any of the test pits, however it should be noted that groundwater depths and ground moisture conditions are affected by climatic conditions, soil permeability and human influences, and will therefore vary with time. Rocky Point is in the wet tropics and subject to wet and dry seasons, during which the groundwater levels may be prone to vary considerably.

Deeply eroded ephemeral water courses / surface drains were observed to the east and north of site indicating the likelihood of significant overland flows during and following significant rainfall events.

6. Laboratory Testing

6.1 Geotechnical Laboratory Testing

Geotechnical laboratory testing comprised:

- Atterberg limits, linear shrinkage, and field moisture content (three tests); and
- Particle size distribution, greater than 0.075 mm (two tests).

Geotechnical laboratory results are summarised in Tables 1 and 2, with laboratory certificates presented in Appendix E.

Table 1: Results of Laboratory Testing – Field Moisture, Atterberg Limits and Linear Shrinkage

Pit	Depth (m)	Primary Description	FMC (%)	LL (%)	PL (%)	PI (%)	LS (%)
4	0.5	Clayey Sandy GRAVEL	18.1	28	23	5	3.5
5	1.0	Clayey SILT	18.0	34	23	11	4.5
8	0.3	Clayey SILT	14.7	24	19	5	2.5

Notes to Table 3
FMC - Field Moisture Content LL - Liquid Limit PL - Plastic Limit PI - Plasticity Index LS – Linear Shrinkage

Table 2: Results of Laboratory Testing - Gradings

Pit	Depth (m)	Primary Description	Gravel (%)	Sand (%)	Silt and clay (%)
1	0.4	Clayey Sandy GRAVEL	38	30	32
4	0.5	Clayey GRAVEL	52	19	29

6.2 Effluent Disposal Laboratory Testing

Effluent disposal laboratory testing comprised:

- Emerson class number, soil pH, electrical conductivity (EC), cation exchange capacity (three tests); and
- total nitrogen, sodium adsorption ratio, phosphorous absorption capacity (three tests).

Effluent disposal laboratory results are summarised in Tables 3 and 4, with laboratory certificates presented in Appendix E.

Table 3: Results of pH, EC, Phosphorous Ssorption and Emerson Class Number Testing

Pit	Depth (m)	Primary Description	Soil pH 1:5	EC (µS/cm)	Phosphorous Sorption Capacity (mgP/kg)	Total Nitrogen in Soil (mg/kg)	Sodium Adsorption Ratio	Emerson Class Number
7	1.7	Silty CLAY	5.9	48	670	170	1.2	5
9	1.5	Clayey SILT	5.2	51	560	180	1.8	6
10	1.0	Clayey SILT	5.4	45	530	270	0.56	5

Table 4: Results of Cation Exchange Capacity Testing

Pit	Depth (m)	Description	Calcium (meq%)	Potassium (meq%)	Magnesium (meq%)	Sodium (meq%)	CEC (meq%)	ESP (%)
7	1.7	Silty CLAY	0.2	<0.1	0.1	<0.1	<1	<1
9	1.5	Clayey SILT	0.1	<0.1	<0.1	<0.1	<1	<1
10	1.0	Clayey SILT	0.5	<0.1	0.2	<0.1	<1	<1

Legend: CEC – cation exchange capacity
ESP – exchangeable sodium percentage

7. Comments

7.1 Appreciation of Site Geotechnical Conditions

The natural ground conditions at the field test locations are generally characterised as comprising medium dense or denser colluvial soils consisting of varying proportions of clayey silt, sand, gravel and cobbles, generally overlying residual stiff or stronger clayey silt transitioning with depth to weathered siltstone bedrock. Fill of similar properties to the colluvial soils was encountered to depths of between 1.2 m and 2.2 m within the north-western portions of each of the building platforms. It is assumed that the fill has been site-won from the uphill (south-western) sides of the building platform areas.

In isolation of upslope instability risk, the assessment of which was not requested by the client but is assumed to have been completed by others, the primary geohazard for this project is anticipated to be that of the existing uncontrolled fill, which should not be relied upon for structural support. The design of on-site effluent disposal systems should only be undertaken by appropriately experienced personnel familiar with the site and climatic conditions, giving particular consideration to hydraulic balance during the wet season.

Further comments on design and construction are given in the following sections of the report.

7.2 Site Classification

AS 2870 (2011) states that site classification is based on expected ground surface movement. Surface movement is usually due to soil reactivity under normal moisture conditions, however in some cases the level of ground movement may be controlled by other factors. Sites where ground movements may be significantly affected by factors other than reactive soil movements under normal moisture conditions are classified as 'Class P' under the standard and footing design must by based on engineering principles.

AS2870 (2011) provides a list of scenarios that would require a 'Class P' classification, including the presence of 'uncontrolled' fill, which applies to the existing building platforms in their current conditions.

7.3 Excavation Conditions

Excavations for high level footings and trenches for effluent disposal are anticipated to encounter either colluvial clayey/silty sandy gravel or residual clayey silt transitioning to very low strength weathered siltstone. It is considered that the colluvial and residual soils should be readily excavatable by standard small sized (ie 12 – 20 tonne) earthmoving equipment. Ripping would likely be required for excavations within low strength or stronger siltstone, depending on fracturing and strength variability.

7.4 Batter Slopes

Short-term temporary batter slopes of 1.5H:1V are suggested for unsurcharged, dry, temporary excavations in natural in-situ soils or existing fill up to 3 m deep. Permanent batter slope angles of no steeper than 3H:1V are suggested, with steeper slopes requiring additional geotechnical assessment, possibly requiring the construction of engineer designed retaining walls (refer Section 7.6).

Stockpiles or heavy plant should not be placed near the batter crests, as this may instigate slope failure. Further advice should be sought from DP if such surcharge is located within the batter vertical height laterally behind the crest.

Surface runoff should be diverted away from the crests and toes of the batters to reduce the potential for scour erosion. It is also recommended that all batters incorporate crest and toe drains and be appropriately vegetated with respect to erosion control.

7.5 Site Preparation

It is suggested that site preparation and fill for the support of ground slabs, pavements and upper level footings be carried out in accordance with the following guidelines::

- Remove all existing uncontrolled fill, surface vegetation, organic topsoil, and any deleterious soft, wet or highly compressible material;.
- Tine the subgrade and adjust the moisture content to within 2% of optimum moisture content for standard compaction (SOMC);
- Compact the subgrade with at least six passes of a minimum 12 t static weight smooth drum roller. Test roll the compacted subgrade under careful inspection by a geotechnical engineer to detect any remaining relatively soft or loose zones, which should be excavated out and replaced with approved engineered fill under ‘Level 1’ inspection and testing;
- If additional fill is required, place approved engineered fill in layers not exceeding 200 mm loose thickness, and compact to at least 98% standard dry density ratio or density index of at least 75%. Moisture contents within cohesive fill should be maintained within 2% of SOMC, during and after compaction; and
- Undertake ‘Level 1’ inspection and testing for all additional fill placement works, in accordance with AS 3798 (2007).

It is important to note that dry, over-compacted cohesive fill or cohesive subgrade (ie compacted to move than 102% SMDD and dry of OMC) is generally more prone to swelling and softening. For this reason, fill compaction and moisture should be carefully controlled on site, with both compaction and moisture control criteria included in the bulk earthworks specification.

Fill placement and compaction under ‘Level 1’ inspection and testing in accordance with AS 3798 (2007), is required where structural loads are to be supported by fill. A ‘Level 1’ inspection and test report must also be prepared at the completion of the works stating that the fill has been completed as recommended above and as required by AS 3798 (2007).

7.6 Retaining Walls

Table 5 presents lateral earth pressure, bulk density and sliding coefficient for the various soils encountered.

Table 5: Geotechnical Retaining Wall Design Parameters

Material	Strength Consistency /Relative Density	Ka	Ko	Kp	Bulk Unit Weight (kN/m^3)	tanδ*
Clayey Silt / Silty Clay	Stiff	0.4	0.55	2.5	18	0.3
	Very stiff or hard	0.4	0.55	2.5	20	
Granular	Medium dense (or denser)	0.28	0.45	3.5	20	0.4

Notes: * for concrete cast directly onto the clean soil surface

For design of retaining walls, due allowance should be made for the following:

- Surcharge loadings (over and above the lateral earth pressure coefficients presented above) where the finished ground level above retaining walls is above horizontal and where additional loading is likely to be applied from existing or future upslope structures, or from traffic.
- Drainage material installed for the full height behind the wall, to a width of at least 0.3 m. The material must be free draining and granular and have a perforated or slotted drainage pipe at the heel of the wall to rapidly remove the water into the stormwater system. If drainage is not provided, the wall loading caused by flooding or inundation, must be considered. Such flooding may penetrate up to 0.9 m depth into cracks behind the wall and result in a hydrostatic load.

Care should be taken when placing soils behind retaining walls, to reduce the risk of damage associated with the use of heavy compaction plant and swelling. Compaction should not exceed 95% to 98% standard maximum dry density ratio and all filling should be placed within 2% of OMC.

It is recommended that factors of safety of 2 against overturning and sliding stability and 1.5 for global stability, be adopted in the design of all retaining walls.

For limit state design methods, the ultimate parameters provided above in Table 5 will need to be factored in accordance with (AS 4678, 2002). Guidance on the selection of material strength partial factors is provided in Section 5.2 of (AS 4678, 2002) and is dependent upon the nature and state of the natural in-situ soil.

7.7 Footings

High level pad and strip footings up to 1 m and 0.6 m wide, respectively, founding in 'controlled' fill, medium dense or denser colluvium or stiff or stronger clayey silt may be sized for a maximum allowable bearing pressure of 100 kPa.

Settlements of approximately 10 mm to 15 mm are estimated for properly designed and constructed pad or strip footings dimensioned and supported as above. Wider footings are possible but would be subject to specific settlement assessment.

7.8 Soil and Site Assessment

The suitability of the site to accept effluent is dependent on a number of factors, including:

- the subsurface profile (soil and groundwater) within the proposed application area;
- the type and output nutrient quality of the treatment system utilised;
- the physical characteristics such as topography, landform, distances to water bodies, etc; and
- prevailing climatic conditions.

The controlling soil for on-site effluent disposal by traditional systems is likely to be the residual clayey silt due to its low permeability and poor soil structure. Based on Table 5.1 of (AS 1547, 2012), for a weakly structured Category 4 soil an indicative permeability of between 0.12 and 0.5 m/day is suggested.

Site and soil characteristics observed during the field work are assigned either a minor, moderate or major limitation depending on the restrictions to the disposal area in accordance with (AS 1547, 2012). The moderate/major limitations for effluent disposal within the site are shown below. Soil and site assessment summaries are provided in Appendix C.

Cation Exchange Capacity (CEC)

The CEC results of <1 meq% fall into the major limitation category due to the inability of these soils to hold plant nutrients.

Soil pH

Soil pH test results of 5.2 and 5.4 fall into the moderate limitation category due to non-optimal plant growth conditions.

Slope Angle

Slope angle of between 10° and 20° (approximately 20% to 40% grade) is a major limiting factor for all disposal systems due to the risk of runoff.

Landform and Site Drainage

The site topography presents a moderate risk of groundwater pollution and transport of waste offsite.

Upslope seepage

The run on and upslope seepage potential is a moderate risk due to transport of wastewater off site.

7.9 Design Effluent Loading Rates

For Category 4 soil it is recommended that the effluent design loading rates and design irrigation rates (DLR/DIR) as presented below in Table 6 be adopted, based on (AS 1547, 2012).

Table 6: Effluent Design Loading / Irrigation Rates

Disposal System	Effluent Design Loading / Irrigation Rates	
	Primary Treated Effluent	Secondary Treated Effluent
Conventional Trenches or Beds	6 to 10 mm/day	20 mm/day
Evapotranspiration/absorption (ETA/ETS) system	8 mm/day	
Irrigation System – Drip or spray	3.5 mm/day[A]	
Irrigation System – Low pressure effluent distribution (LPED)	3 mm/day	
Mound System	8 mm/day	

Notes: A requires a minimum of 150 mm of high-quality topsoil

8. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 1299 Mossman Daintree Road in accordance with DP's proposal dated 23 April 2022 and acceptance received from John Deicke dated 28 April 2022. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Office Deicke for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope of work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

9. References

AS 1547. (2012). *On-site domestic wastewater management.* Standards Australia.

AS 2870. (2011). *Residential Slabs and Footings.* Standards Australia.

AS 3798. (2007). *Guidelines on Earthworks for Commercial and Residential Developments.* Standards Australia.

AS 4678. (2002). *Earth-retaining structures.* Standards Australia.

Department of Mines and Energy. (1999). Mossman. Brisbane, QLD: Queensland Government.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

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Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w <PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w >PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈LL' (i.e. near the liquid limit).
- 'Wet' or 'w >LL' (i.e. wet of the liquid limit).

Symbols & Abbreviations

Douglas Partners

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

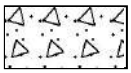
Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

Soils


Topsoil

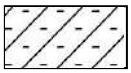

Peat


Clay

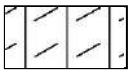

Silty clay

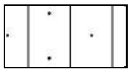

Sandy clay

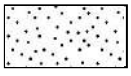

Gravelly clay


Shaly clay

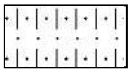

Silt

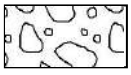

Clayey silt


Sandy silt

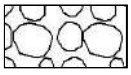

Sand

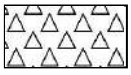

Clayey sand


Silty sand


Gravel

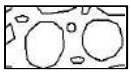

Sandy gravel


Cobbles, boulders

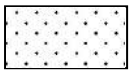

Talus

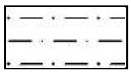
Sedimentary Rocks

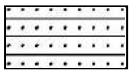

Boulder conglomerate

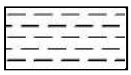

Conglomerate


Conglomeratic sandstone

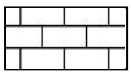

Sandstone


Siltstone

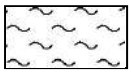

Laminite

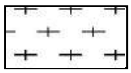

Mudstone, claystone, shale

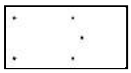

Coal


Limestone

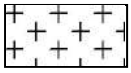
Metamorphic Rocks


Slate, phyllite, schist

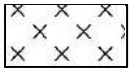

Gneiss


Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite

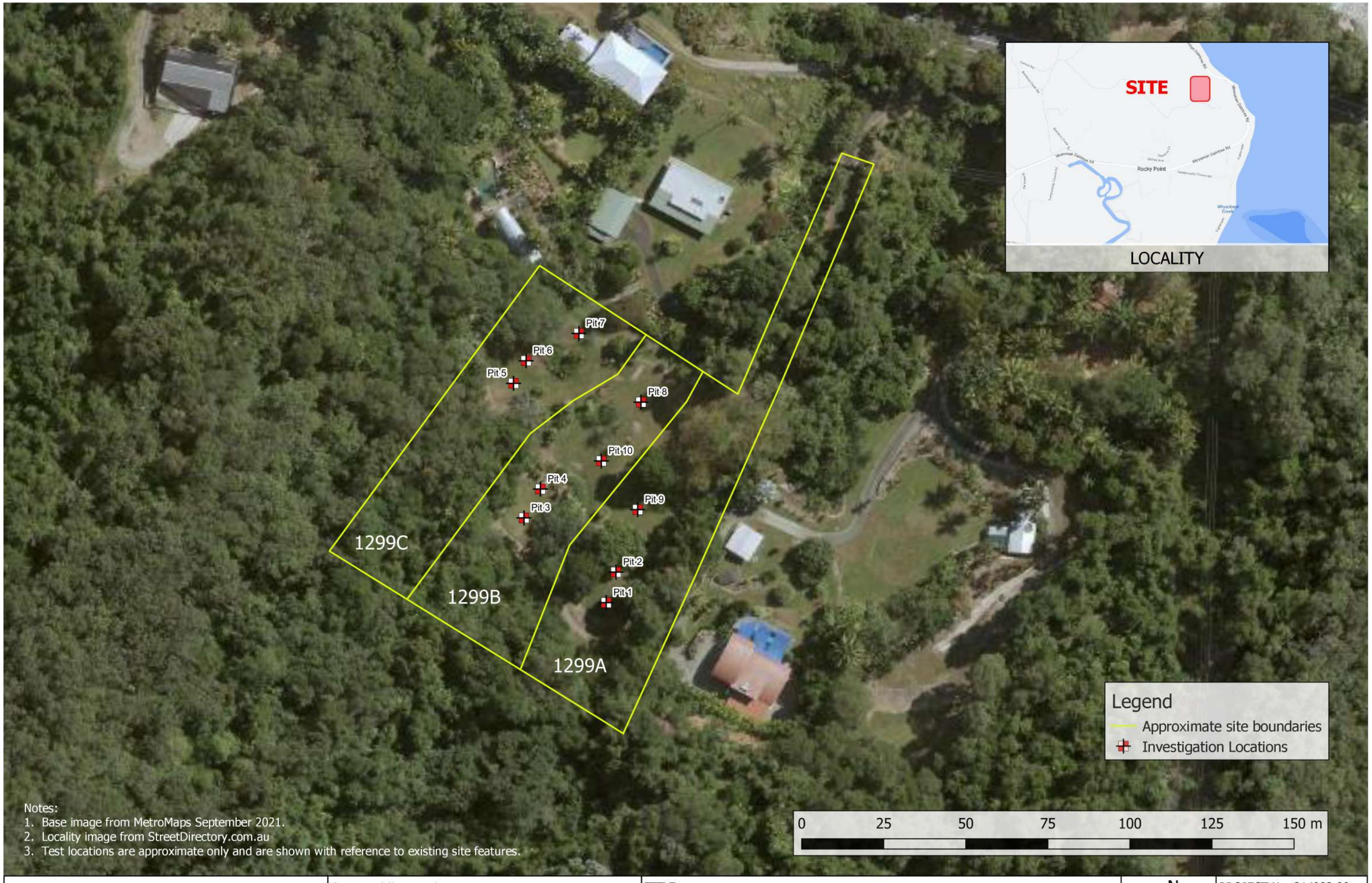

Dacite, epidote


Tuff, breccia


Porphyry

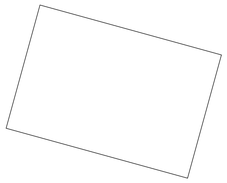
Appendix B

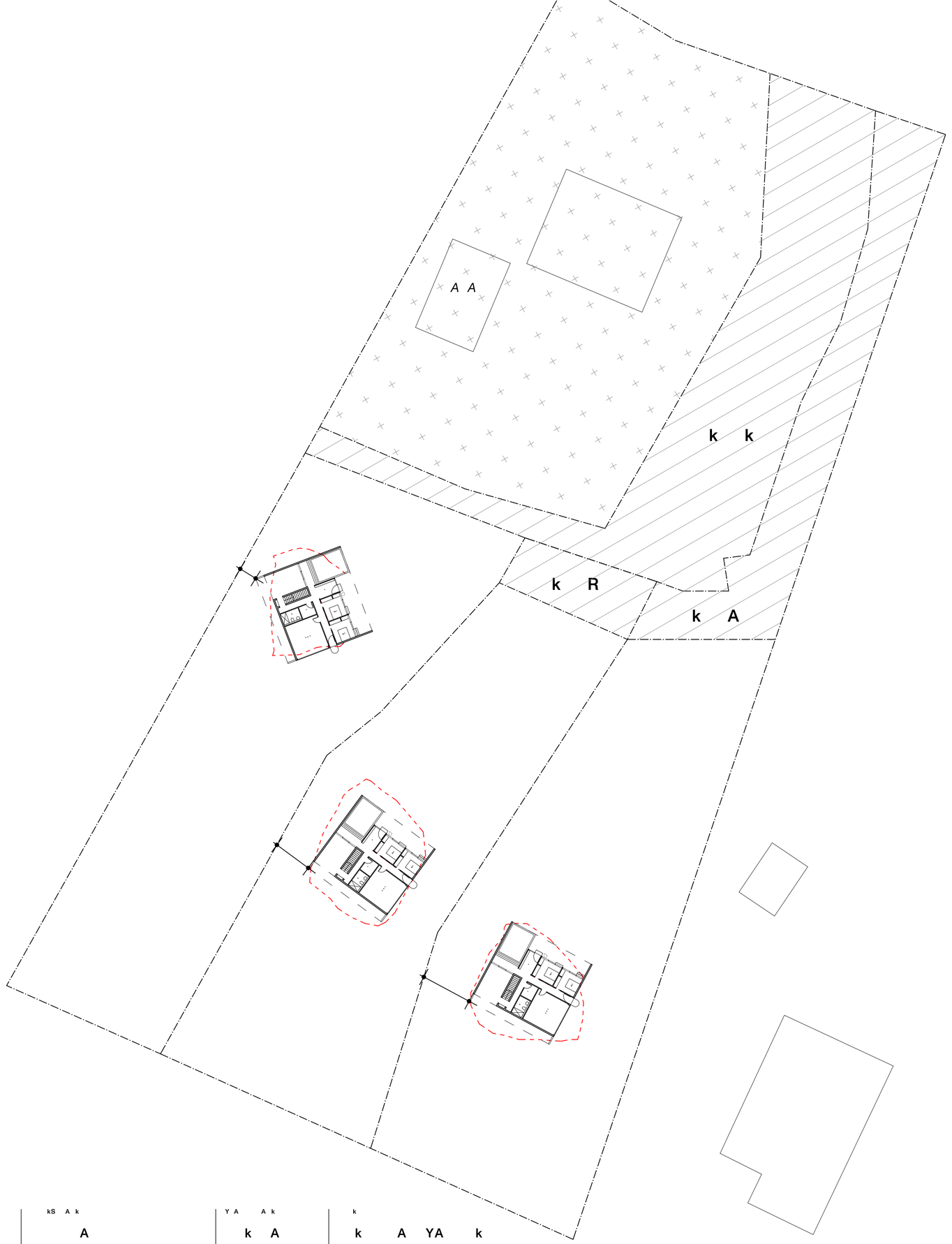
Drawings



Notes:
1. Base image from MetroMaps September 2021.
2. Locality image from StreetDirectory.com.au
3. Test locations are approximate only and are shown with reference to existing site features.

Douglas Partners Geotechnics · Environment · Groundwater	CLIENT: Office Deicke	TITLE: Site and Test Location Plan Proposed Residences Mossman Daintree Road, Rocky Point	N
	OFFICE: Cairns / DRAWN BY: CM		PROJECT No: 214803.00
	SCALE: As shown / DATE: June 2022		DRAWING No: 1
			REVISION: 0





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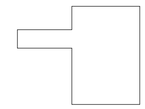

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Appendix C

Table C1 - Effluent Disposal Soil Assessment Summary
Table C2 - Effluent Disposal Site Assessment Summary

Table C1 - Soil Assessment Summary

Soil Feature	Relevant System(s)	Minor Limitation	Moderate Limitation	Major Limitation	Restrictive Feature
Depth to bedrock or hardpan (m)	Surface and sub-surface irrigation	**>1.0**	0.5 – 1.0	<0.5	Restricts plant growth (trees), excessive runoff, waterlogging
	Absorption system	**>1.5**	1.0 – 1.5	<1.0	Groundwater pollution hazard. Resurfacing hazard
Depth to high episodic or seasonal water table (m)*	Surface and sub-surface irrigation	**>1.0**	0.5 – 1.0	<0.5	Groundwater pollution hazard. Resurfacing hazard
	Absorption system	**>1.5**	1.0 – 1.5	<1.0	Potential for groundwater pollution
Soil permeability Category	Surface and sub-surface irrigation	**2b, 3 and 4**	2a, 5	1 and 6	Excessive run-off, waterlogging, percolation
	Absorption system	**3 and 4**		1,2,5 and 6	
Coarse fragments (%)	All land application systems	**0-20**	20-40	>40	May restrict plant growth, affect trench installation
pH	All land application systems	>6.0	**4.5 – 6.0**	<4.5	Reduces optimum plant growth
Electrical conductivity (dS/m)	All land application systems	**<4**	4-8	>8	Excessive salt may restrict plant growth
Sodicity (exchangeable sodium percentage)[#]	Surface and sub-surface irrigation (0-0.4m)	**0-5**	5-10	>10	Potential for structural degradation
	Absorption system (0-1.2m)				
Cation exchange capacity (cmol+/kg) (0-40cm)	Surface and sub-surface irrigation	>15	5-15	**<5**	Unable to hold plant nutrients
Phosphorous sorption (kg P/ha) (0-1m for irrigation) (1 m below intended base of trench)	All land application systems	**>6000**	2000-6000	<2000	Unable to immobilise any excess P

Bold text indicates applicable limitation

** water table taken as 2.0 m below ground level*

Adapted from NSW EPA, "Environmental and Health Protection Guidelines, on-site Sewage Management for Single Households", January 1998

Table C2 - Site Assessment Summary

Site Feature	Relevant System(s)	Minor Limitation	Moderate Limitation	Major Limitation	Restrictive Feature
Flood potential	All land application systems	**Rare, above 1 in 20 year flood contour**		Frequent, below 1 in 20 year flood contour	Transport of wastewater off-site
	All treatment systems	**Vents, openings, and electrical components above 1 in 100 year flood contour**		Vents, openings, and electrical components below 1 in 100 year flood contour	Transport of wastewater off-site. System failure and electrocution hazard
Exposure	All land application systems	**High sun and wind exposure**		Low sun and wind exposure	Poor evapotranspiration
Slope %	Surface irrigation	**0-6**	6-12	**>12**	Run-off, erosion
	Sub-surface irrigation	**0-10**	10-20	**>20**	
	Absorption system	**0-10**	10-20	**>20**	
Landform	All systems	Hill crests, convex side slopes and plains	**Concave side slopes and foot slopes**	Drainage plains and incised channels	Groundwater pollution and resurfacing hazard
Run-on and upslope seepage	All land application systems	None – low	**Moderate**	High – diversion not practical	Transport of wastewater off-site
Erosion potential	All land application systems	**No signs of erosion potential present**		Signs of erosion, eg rills, mass movement and slope failure present	Soil degradation and transport, system failure
Site drainage	All land application systems	**No visible signs of surface dampness**		Visible signs of surface dampness, such as moisture-tolerant vegetation, and seepages, soaks and springs	Groundwater pollution hazard. Resurfacing hazard
Fill	All systems	**No fill**	Fill present		Subsidence. Variable permeability
Land area	All systems	**Area is available**	Area is limited	Area is not available	Health and pollution risks
Rocks and rock outcrops (% of land surface containing boulders)	All land application systems	**<10%**	10-20%	>20%	Limits system performance
Geology/ Regolith	All land application systems			Major geological discontinuities, fractured or highly porous regolith	Groundwater pollution hazard

Bold text indicates applicable limitations

Adapted from NSW EPA, "Environmental and Health Protection Guidelines, on-site Sewage Management for Single Households", January 1998

Appendix D

Field Work Results

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 38.8 m AHD
EASTING: 330539
NORTHING: 8187979

PIT No: 1
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
38	0	Silty Sandy GRAVEL GM: pale brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, loose, colluvial							
		- medium dense below 0.4 m depth		D	0.4		pp = 170		
					0.6		pp = 200		
					0.8		pp = 180		
	1				1.0		pp = 170		
37									
	2								
36									
	3								
		- boulder at 3.6 m depth							
35	3.9	Pit discontinued at 3.9m depth - limit of excavator reach							

Dynamic Penetrometer Test (blows per 100mm): 5, 10, 15, 20

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 39.6 m AHD
EASTING: 330542
NORTHING: 8187989

PIT No: 2
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
39	0.3	FILL / Silty Sandy GRAVEL: dark brown and pale brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, trace rootlet, moist, medium dense							
				D	0.5		pp = 150		
					0.6		pp = 140		
					0.9		pp = 100		
38	1.2	Silty Sandy GRAVEL: pale brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense, colluvial							
		- very dense below 2.2 m		D	2.5				
37	3.0	Pit discontinued at 3.0m depth							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 38.8 m AHD
EASTING: 330514
NORTHING: 8188005

PIT No: 3
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
38	0.2	Clayey SILT ML / SILTSTONE HW: Approximately 50% pale brown, low plasticity, w<PL, hard (extremely weathered Argillite) and 50% pale brown, very low strength, highly weathered siltstone		D	0.2		pp >600		5 10 15 20
	0.3				0.3		pp >600		
	0.4				0.4		pp >600		
	0.6				0.6		pp >600		
	0.8				0.8		pp >600		
1									1
	1.5								
	1.7	SILTSTONE HW: brown and grey, very low-low strength, Hodgkinsons Formation		D	1.6				
		Pit discontinued at 1.7m depth - refusal on very low strength siltstone							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 38.6 m AHD
EASTING: 330519
NORTHING: 8188014

PIT No: 4
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
38	0	FILL / Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense		D	0.2		pp = 180		
					0.4		pp = 150		
					0.5				
					0.6		pp = 100		
					0.8		pp = 90		
37	2.2	Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense, colluvial		D	3.0				
35	3.7	Pit discontinued at 3.7m depth - limit of excavator reach							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 36.6 m AHD
EASTING: 330511
NORTHING: 8188046

PIT No: 5
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
36	0.5	Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense, colluvial		D	0.4				
					0.5		pp >600		
		Clayey SILT ML: brown, low plasticity, trace sand and gravel, w<PL, hard, extremely weathered Hodgkinsons Formation			0.6		pp >600		
	1				0.9		pp >600		
				D	1.0				
35	1.4	SILTSTONE HW: brown and grey, very low strength							
	2	2.0 Pit discontinued at 2.0m depth - refusal on very low strength siltstone							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Dynamic penetrometer test completed at ground surface, and reattempted at 1.1 m depth

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 36.4 m AHD
EASTING: 330515
NORTHING: 8188054

PIT No: 6
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
36	0.0	FILL / Silty Sandy GRAVEL: brown, fine to coarse subangular gravel and sand, low plasticity silt with subangular cobble, moist, medium dense		D	0.5		pp range from 100-200 kPa in top 1.0 m depth		
35	1				1.0				
34	2	Clayey SILT ML: brown, low plasticity, trace sand and gravel, trace cobble, w<PL, very stiff, residual							
	3			D	3.0				
	3.2	Pit discontinued at 3.2m depth - refusal on very low strength siltstone							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 31 m AHD
EASTING: 3305314
NORTHING: 8188062

PIT No: 7
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
31	0.2	Topsoil / Clayey SILT ML: dark brown, low plasticity, with organics (rootlets), trace sand and gravel, w~PL, firm		D	0.1		pp = 100		
		Clayey SILT ML: brown, low plasticity, with subrounded and subangular sand and gravel, w<PL, stiff, colluvial		D	0.3 0.4 0.5		pp = 180 pp = 220		
30	1				0.7		pp = 190		1
					0.9		pp = 200		
	1.5	Silty CLAY CI: red brown, medium plasticity, trace sand and gravel, very stiff, possibly residual		D	1.7				
29	2 2.0	Pit discontinued at 2.0m depth							2

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 32 m AHD
EASTING: 330550
NORTHING: 8188041

PIT No: 8
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
32	0.2	Topsoil / Clayey SILT ML: dark brown, low plasticity, with organics (rootlets), trace sand and gravel, w~PL, stiff							
		Clayey SILT ML: brown, low plasticity, with subangular and subrounded sand and gravel, trace cobble, w~PL, stiff, colluvial		D	0.3		pp = 180		
		- becoming w>PL below 0.4 m depth			0.6		pp = 200		
31	1				0.9		pp = 190		
				D	1.0				
		- very stiff grading to hard below 1.4 m depth							
				D	1.8				
30	2								
				D	2.5				
29	3	3.0 Pit discontinued at 3.0m depth							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 35 m AHD
EASTING: 330549
NORTHING: 8188008

PIT No: 9
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
35	0.2	Topsoil / Clayey SILT ML: dark brown, low plasticity, with organics (rootlets), trace sand and gravel, w>PL, firm to stiff			0.3		pp = 220		
		Clayey SILT ML: brown, low plasticity, trace subrounded and subangular sand and gravel, trace cobble, w>PL, stiff, colluvial		D	0.5 0.6		pp = 190		
34	1				0.9		pp = 240		
		- with subrounded to subangular sand and gravel and subangular to subrounded cobble, below 1.1 m depth		D	1.0				
33	2	- hard below 1.9 m depth							
32	3								
	3.9	Pit discontinued at 3.9m depth - limit of excavator reach							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Dynamic penetrometer test completed at ground surface, and reattempted at 1.0 m depth

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Office Deicke
PROJECT: Proposed Residences
LOCATION: Mossman Daintree Road, Rocky Point

SURFACE LEVEL: 34 m AHD
EASTING: 330538
NORTHING: 8188023

PIT No: 10
PROJECT No: 214803.00
DATE: 4/5/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 100mm)
34	0.15	Topsoil Clayey / SILT ML: dark brown, low plasticity, with sand and gravel, with organics (rootlets) w>PL, firm to stiff							
		Clayey SILT ML: brown, low plasticity, with subangular to subrounded sand and gravel, trace cobble, w=PL, stiff, colluvial			0.3		pp = 150		
				D	0.5				
					0.6		pp = 200		
		- w>PL below 0.8 m depth			0.9		pp = 150		
33	1			D	1.0				1
				D	1.5				
		- hard below 1.7 m depth							
32	2								2
				D	2.5				
	2.7	Pit discontinued at 2.7m depth							

RIG: Kubota 6 tonne with 450 mm bladed bucket

LOGGED: McDonald

SURVEY DATUM: GDA94 Zone 55K

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☒ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

Appendix E

Laboratory Test Results

Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
Phone: (07) 4779 9866
Email: Townsville@douglaspartners.com.au

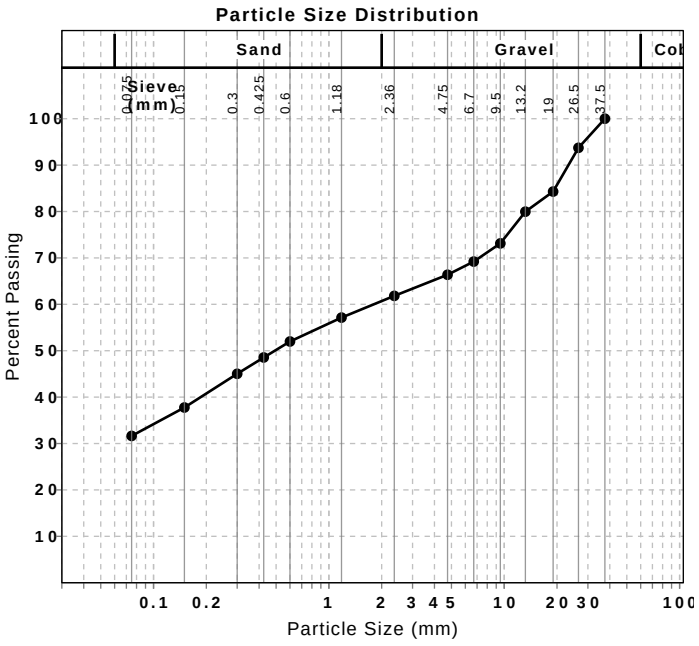
Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777A
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 16/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 1 , Depth: 0.4**
Material: Soil & Cobble

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
37.5 mm	**100**		
26.5 mm	**94**		
19 mm	**84**		
13.2 mm	**80**		
9.5 mm	**73**		
6.7 mm	**69**		
4.75 mm	**66**		
2.36 mm	**62**		
1.18 mm	**57**		
0.6 mm	**52**		
0.425 mm	**49**		
0.3 mm	**45**		
0.15 mm	**38**		
0.075 mm	**32**		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	14.1



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
Phone: (07) 4779 9866
Email: Townsville@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

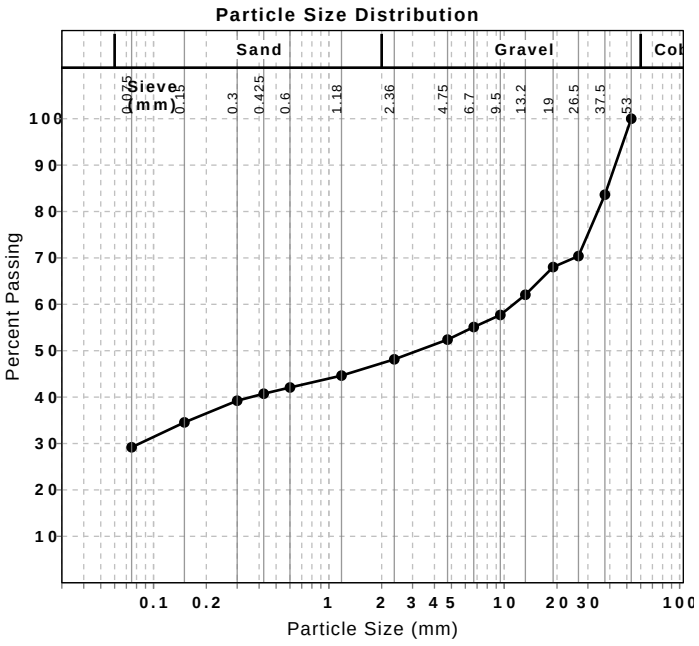
Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777B
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 16/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 4 , Depth: 0.5**
Material: Soil & Cobble

Particle Size Distribution (AS1289 3.6.1)			
Sieve	Passed %	Passing Limits	
53 mm	**100**		
37.5 mm	**84**		
26.5 mm	**70**		
19 mm	**68**		
13.2 mm	**62**		
9.5 mm	**58**		
6.7 mm	**55**		
4.75 mm	**52**		
2.36 mm	**48**		
1.18 mm	**45**		
0.6 mm	**42**		
0.425 mm	**41**		
0.3 mm	**39**		
0.15 mm	**35**		
0.075 mm	**29**		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	28		
Plastic Limit (%)	23		
Plasticity Index (%)	**5**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	3.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	18.1



Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
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Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777C
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 16/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 5 , Depth: 1.0**
Material: Clayey Silt

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	34		
Plastic Limit (%)	23		
Plasticity Index (%)	**11**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	4.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	18.0

Material Test Report

Douglas Partners
Geotechnics / Environment / Groundwater
Douglas Partners Pty Ltd
Townsville Laboratory
29 Civil Road Garbutt QLD 4814
Phone: (07) 4779 9866
Email: Townsville@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Tanya Dilley
Laboratory Manager
Laboratory Accreditation Number: 828

Report Number: **214803.00-1**
Issue Number: 1
Date Issued: 17/05/2022
Client: Office Deicke
71 Gilgandra Street, Indooroopilly QLD 4006
Contact: John Deicke
Project Number: 214803.00
Project Name: Proposed Residences
Project Location: Mossman Daintree Road, Rocky Point QLD
Work Request: 2777
Sample Number: TW-2777D
Date Sampled: 05/05/2022
Dates Tested: 09/05/2022 - 13/05/2022
Sampling Method: Sampled by Engineering Department
The results apply to the sample as received
Sample Location: **Pit 8 , Depth: 0.3**
Material: Clayey Silt

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	24		
Plastic Limit (%)	19		
Plasticity Index (%)	**5**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	2.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)	
Moisture Content (%)	14.7

Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 294891

Client Details

Client	Douglas Partners (Cairns) Pty Ltd
Attention	Aidan McDonald
Address	13 Industrial Ave, Stratford, QLD, 4870

Sample Details

Your Reference	**214803.00 Rocky Point, Proposed Residences**
Number of Samples	3 Soil
Date samples received	06/05/2022
Date completed instructions received	06/05/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

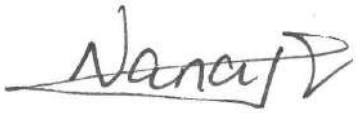
Date results requested by	16/05/2022
Date of Issue	16/05/2022

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager

Authorised By



Nancy Zhang, Laboratory Manager

Misc Inorg - Soil				
Our Reference		294891-1	294891-2	294891-3
Your Reference	UNITS	Pit 7	Pit 9	Pit 10
Depth		1.7	1.5	1
Date Sampled		04/05/2022	04/05/2022	04/05/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	12/05/2022	12/05/2022	12/05/2022
Date analysed	-	12/05/2022	12/05/2022	12/05/2022
pH 1:5 soil:water	pH Units	5.2	5.2	5.4
Electrical Conductivity 1:5 soil:water	µS/cm	48	51	45
Total Nitrogen in Soil	mg/kg	170	180	270
Sodium Adsorption Ratio		1.2	1.8	0.56
Emerson Class No.	-	5.0	6.0	5.0
Phosphorus Sorption Capacity	mg/kg	670	560	530

ESP/CEC				
Our Reference		294891-1	294891-2	294891-3
Your Reference	UNITS	Pit 7	Pit 9	Pit 10
Depth		1.7	1.5	1
Date Sampled		04/05/2022	04/05/2022	04/05/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	12/05/2022	12/05/2022	12/05/2022
Date analysed	-	13/05/2022	13/05/2022	13/05/2022
Exchangeable Ca	meq/100g	0.2	0.1	0.5
Exchangeable K	meq/100g	<0.1	<0.1	<0.1
Exchangeable Mg	meq/100g	0.1	<0.1	0.2
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	<1	<1	<1
ESP	%	<1	<1	<1

Method ID	Methodology Summary
Ext-037	Analysed by Sydney Environmental & Soil Laboratory
Ext-062	Analysed by East West Enviroag
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
INORG-127	Total Nitrogen by high temperature catalytic combustion with chemiluminescence detection.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-020	Calcium and Magnesium analysed by ICP-AES and SAR calculated.

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			12/05/2022	1	12/05/2022	12/05/2022		12/05/2022	[NT]
Date analysed	-			12/05/2022	1	12/05/2022	12/05/2022		12/05/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	1	5.2	5.1	2	100	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	1	48	39	21	104	[NT]
Total Nitrogen in Soil	mg/kg	10	INORG-127	<10	1	170	170	0	92	[NT]
Sodium Adsorption Ratio		0.01	Metals-020	<0.01	1	1.2	[NT]		113	[NT]
Emerson Class No.	-	0	Ext-037	[NT]	1	5.0	[NT]		[NT]	[NT]
Phosphorus Sorption Capacity	mg/kg	na	Ext-062	[NT]	1	670	[NT]		[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			12/05/2022	[NT]	[NT]	[NT]	[NT]	12/05/2022	[NT]
Date analysed	-			13/05/2022	[NT]	[NT]	[NT]	[NT]	13/05/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
ESP	%	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

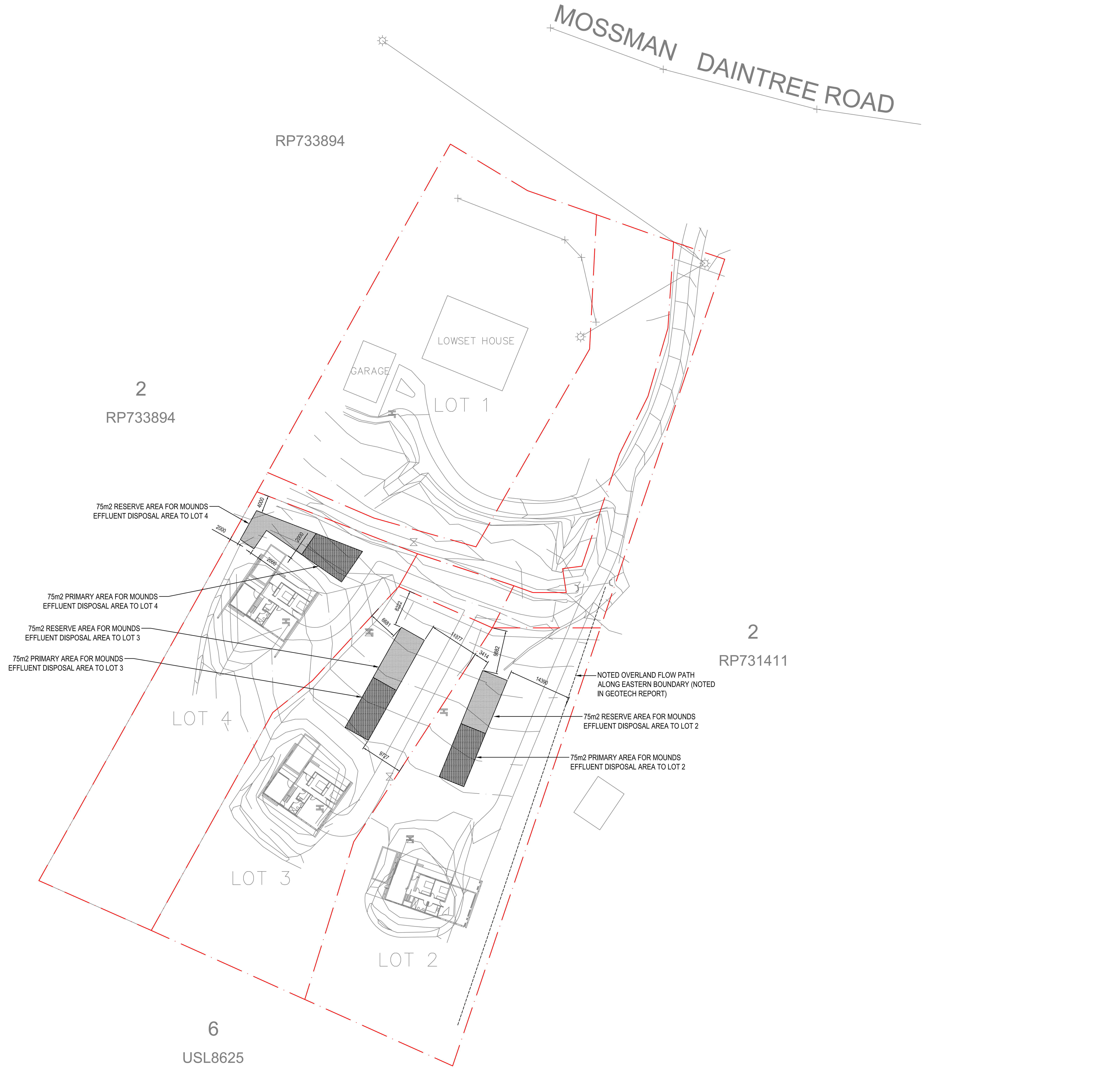
Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Emerson Class No. & Phosphorus Sorption Capacity analysed by East West Geo Ag Enviro. Report No. EW220977

Appendix C – Site Plan – Effluent Disposal Plan



NOTES

1. THE WHOLE OF THE PLUMBING AND DRAINAGE WORK SHALL BE INSTALLED IN ACCORDANCE WITH QLD PLUMBING AND DRAINAGE ACT 2018, QLD PLUMBING AND DRAINAGE REGULATION 2019, AS/NZS:3500, AS/NZS1547, THE LOCAL AUTHORITY APPROVED DRAWINGS, REQUIREMENTS & COMPLIANCE PERMIT CONDITIONS.

EXISTING SERVICES

SERVICES SHOWN AS EXISTING HAVE BEEN INTERPOLATED FROM RECORD DRAWINGS. CONTRACTOR TO VERIFY LOCATIONS AND LEVELS PRIOR TO COMMENCEMENT OF WORK.

0 10 20 30 m

SCALE 1:1000 @ A3 / SCALE 1:500 @ A1

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
02	FOR APPROVAL	24.06.22	CC	DC
01	DRAFT ISSUE	22.06.22	CC	DC

North

Client: DEBELL PROPERTY TRUST

Architect: OFFICE Deicke
46 Little La Trobe Street
Melbourne, VIC 3004
PHONE : 0438 182 712

ACOR Consultants (QLD) Pty Ltd
Level 7, 22 Cordelia Street
South Brisbane QLD 4101
T +61 7 3844 5900
CONSULTANTS ENGINEERS | MANAGERS | INFRASTRUCTURE PLANNERS | DEVELOPMENT CONSULTANTS

Project: MOSSMAN HOUSES
1295 MOSSMAN - DAINTREE ROAD
ROCKY POINT, QLD 4873

Drawing Title: HYDRAULIC SERVICES
SITE PLAN - EFFLUENT DISPOSAL PLAN

Drawn	Date	Scale A1	Q.A. Check	Date
CC	JUN 2022	1:500	-	-

Designed	Project No.	Dwg. No.	Issue
DC	BR220116	H2.01	02

Jun 24, 2022 - 4:56pm

Appendix D – Architectural Plans

NOTE: EXACT LOCATION AND ORIENTATION OF DWELLING TO BE CONFIRMED

1 - SITE PLAN

ARCHITECT

OFFICE Deicke

46 Little La Trobe St
Melbourne 3004
Victoria
0438 182 712
officedeicke.com.au
ABN 66 655 606 858

AMENDMENTS

ISSUE	DATE	SUBJECT	AUTH
A	25.04.2022	CONSULTANT ISSUE	JD
B	04.05.2022	PRELIMINARY DA ISSUE	JD

CONSULTANTS

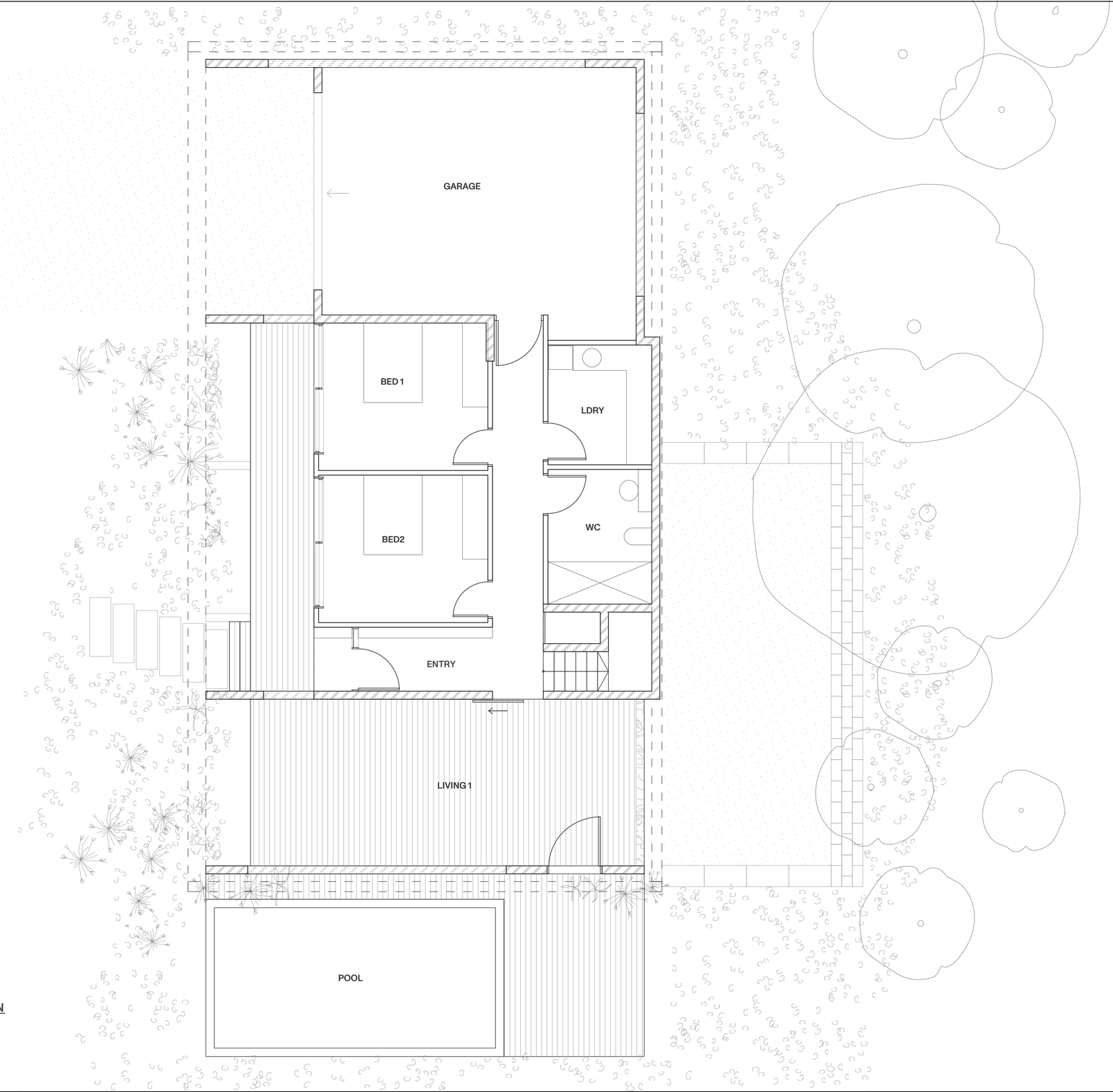
CONTRACTOR

CLIENT
DEBELL PROPERTY TRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
SITE PLAN

PROJECT NO. 21.004
SCALE 1:500 @ A1
DRAWING NO. DA_A0_0101
REVISION B
DRAWN CD
CHECKED JD
AUTH. JD
STATUS DEVELOPMENT APPLICATION



1 / - GROUND FLOOR PLAN

ARCHITECT

OFFICE Deicke

46 Little La Trobe St
Melbourne 3004
Victoria
0438 182 712
officedeicke.com.au
ABN 66 655 606 858

AMENDMENTS

ISSUE	DATE	SUBJECT	AUTH
A	25.04.2022	CONSULTANT ISSUE	JD
B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 2 HOUSE GROUND FLOOR PLAN

PROJECT NO. 21.004

SCALE 1:50 @ A1

DRAWING NO. DA_A2_0201

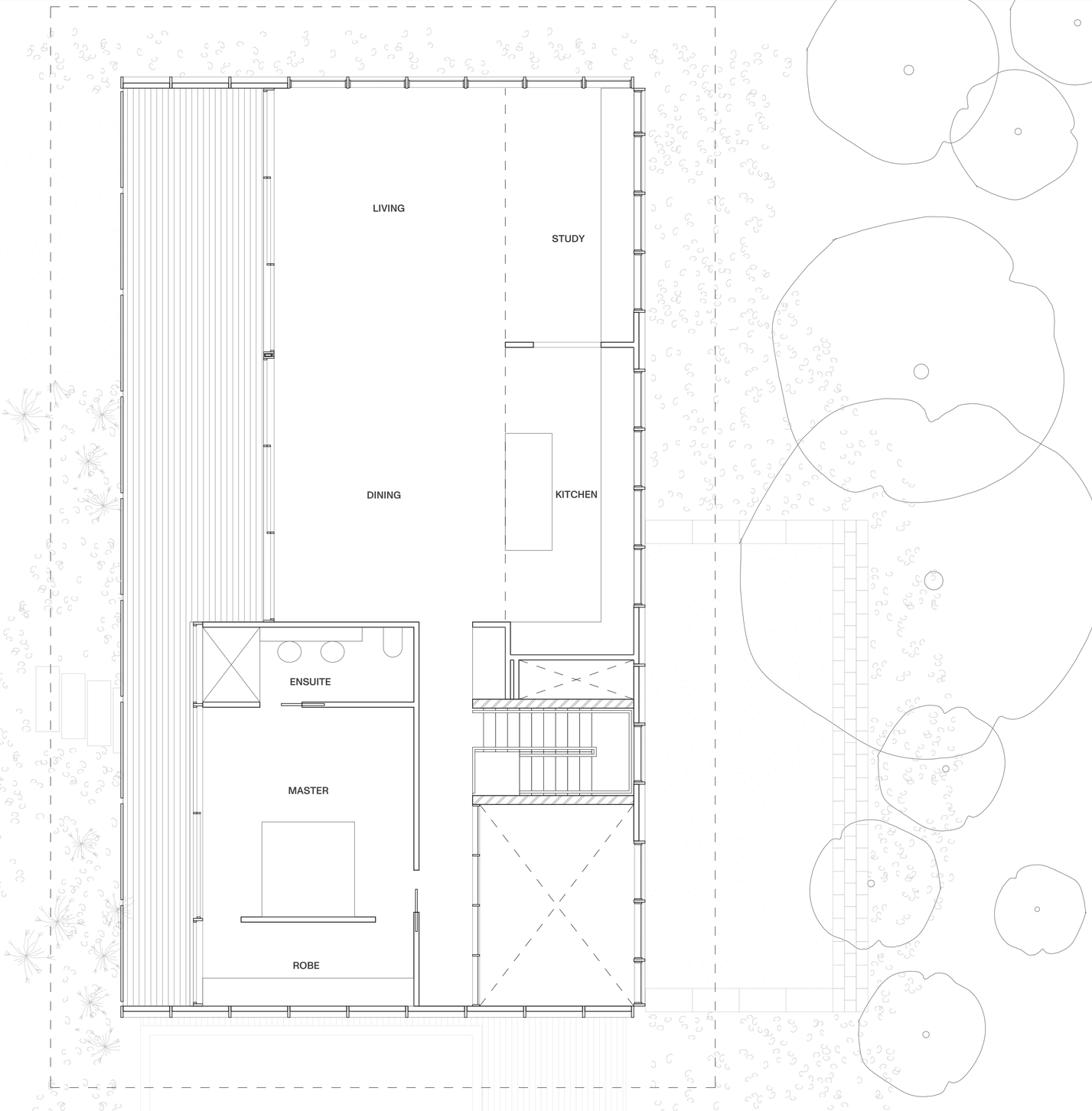
REVISION B

DRAWN CD

CHECKED JD

AUTH. JD

STATUS
DEVELOPMENT APPLICATION



1 / - FIRST FLOOR PLAN

ARCHITECT

OFFICE Deicke

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Melbourne 3004
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ABN 66 655 606 858

AMENDMENTS

ISSUE	DATE	SUBJECT	AUTH
A	25.04.2022	CONSULTANT ISSUE	JD
B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 2 HOUSE FIRST FLOOR PLAN

PROJECT NO.
21.004

SCALE
1:50 @ A1

DRAWING NO.
DA_A2_0202

REVISION
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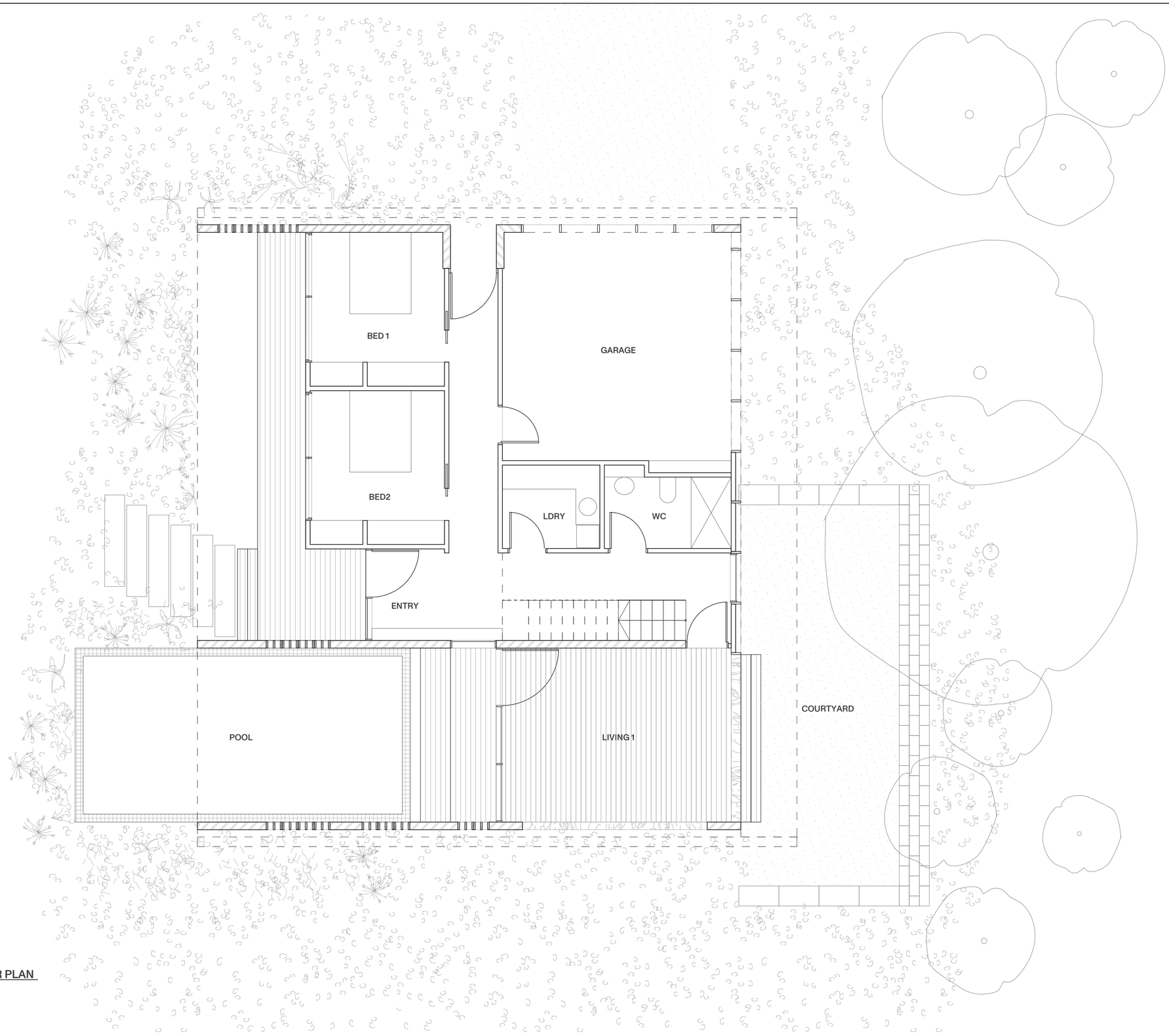
JD

STATUS
DEVELOPMENT APPLICATION



1 / - GROUND FLOOR PLAN

ARCHITECT

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ABN 66 655 606 858

AMENDMENTS

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B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 3 HOUSE GROUND FLOOR PLAN

PROJECT NO. 21.004
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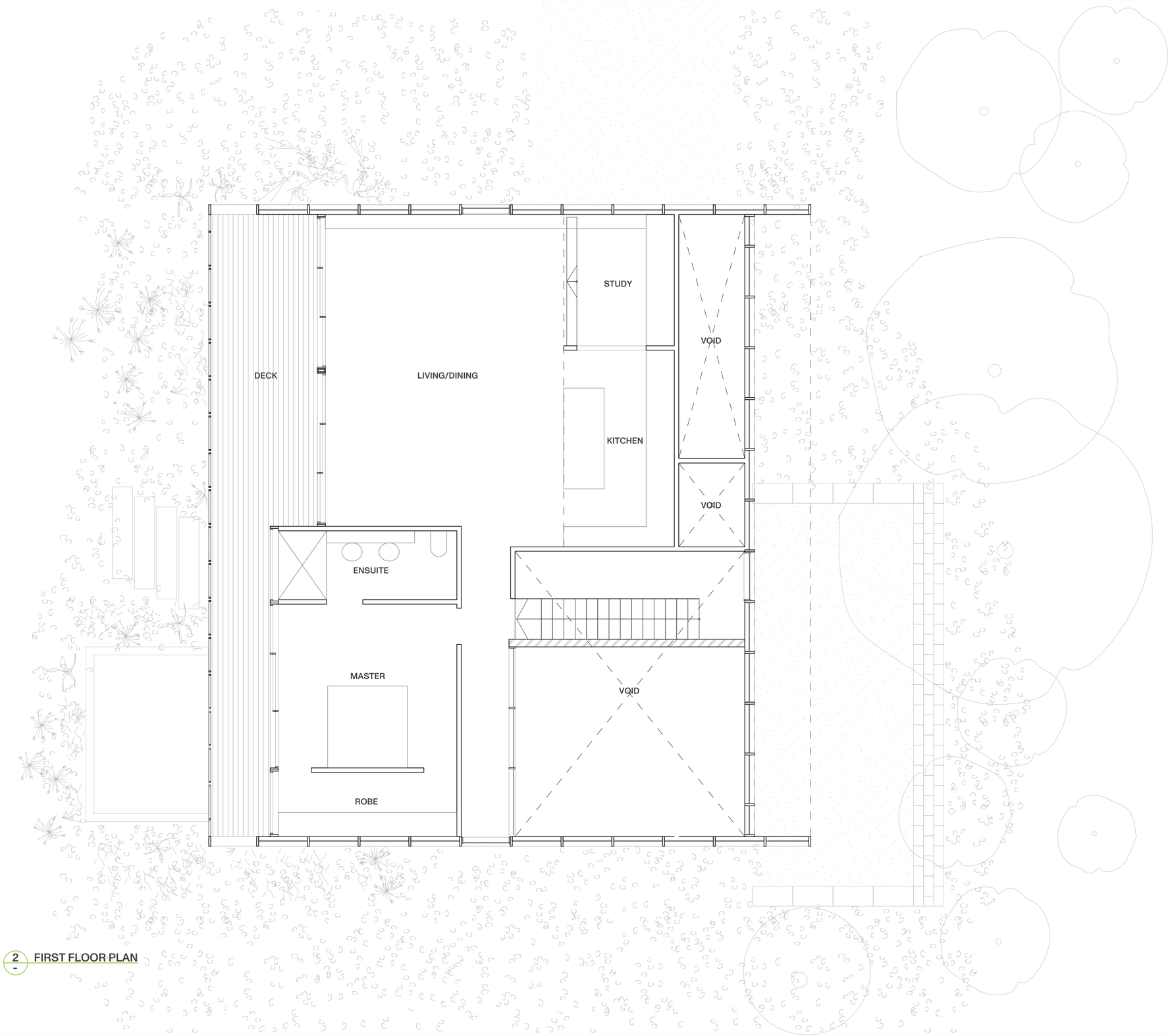
DRAWING NO. DA_A3_0201
REVISION B
DRAWN CD
CHECKED JD
AUTH. JD
STATUS DEVELOPMENT APPLICATION



2 - FIRST FLOOR PLAN

ARCHITECT

OFFICE Deicke

46 Little La Trobe St
Melbourne 3004
Victoria
0438 182 712
officedeicke.com.au
ABN 66 655 606 858

AMENDMENTS

ISSUE	DATE	SUBJECT	AUTH
A	25.04.2022	CONSULTANT ISSUE	JD
B	04.05.2022	PRELIMARY DA ISSUE	JD

CONSULTANTS

CONTRACTOR

CLIENT
DEBELL PROPERTY STRUST

PROJECT NAME
MOSSMAN

DRAWING NAME
LOT 3 HOUSE FIRST FLOOR PLAN

PROJECT NO.
21.004

SCALE
1:50 @ A1

DRAWING NO.
DA_A3_0202

REVISION
B

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CD

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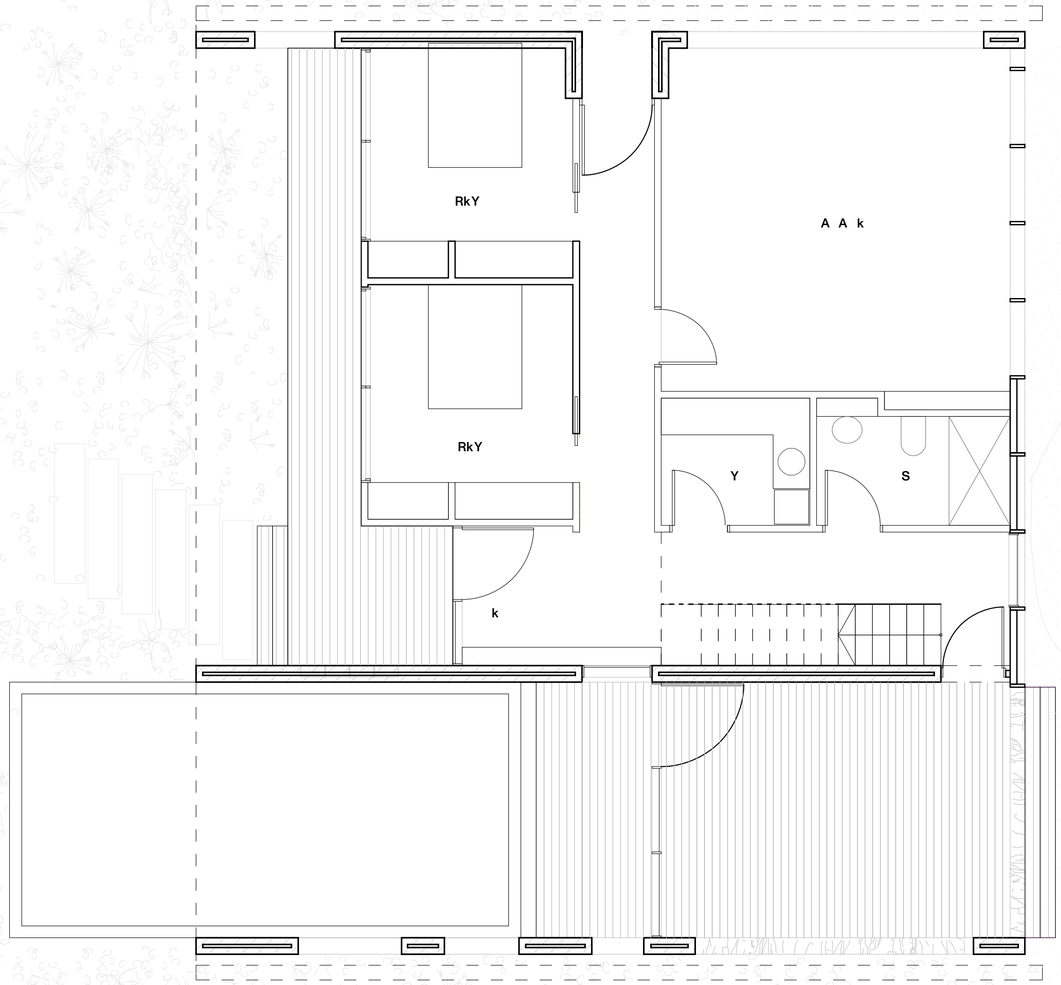
JD

AUTH.
JD

STATUS
DEVELOPMENT APPLICATION



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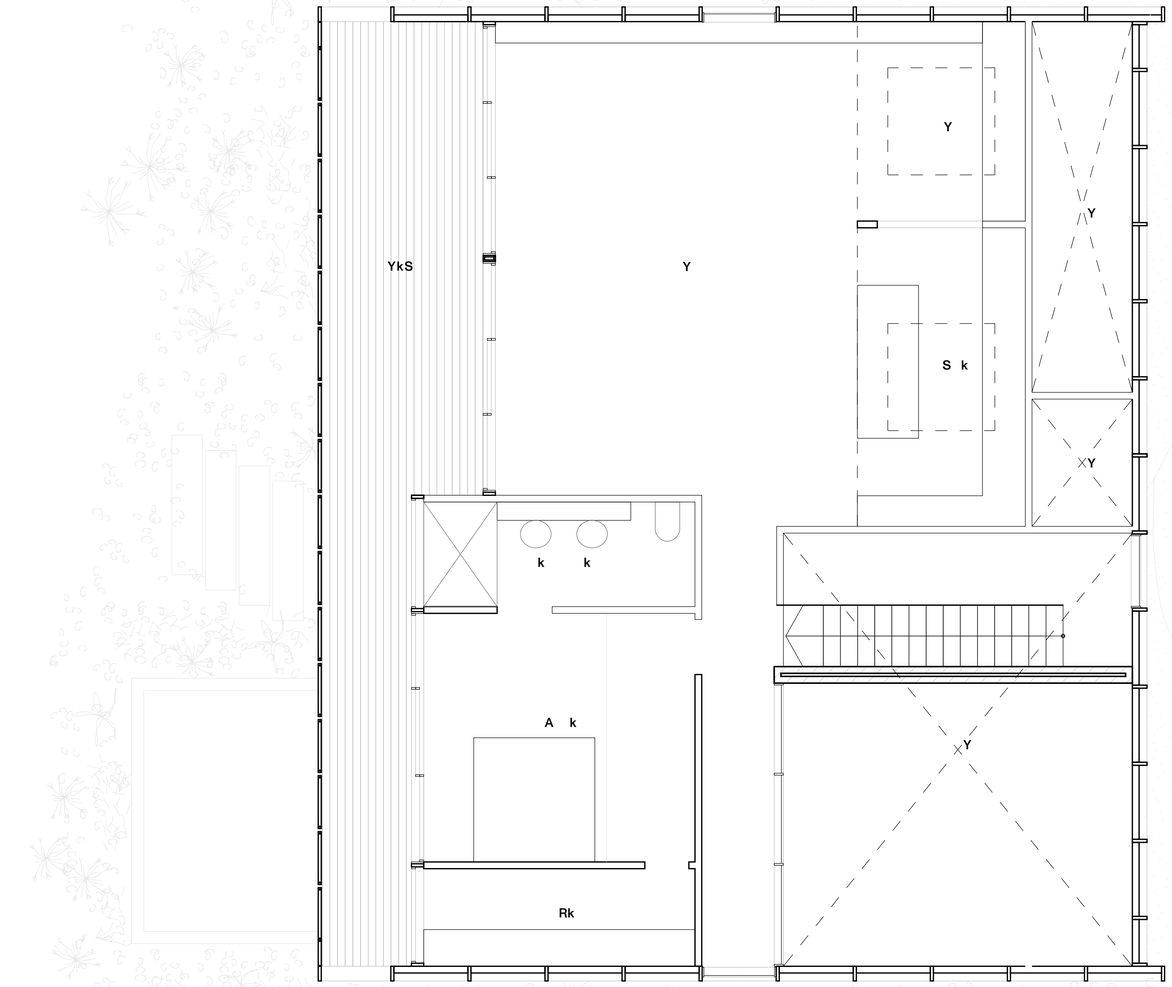

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Appendix E – Calculations

Job Number - BR220116
Job Name - Proposed Residences
Mossman-Daintree Road, Rocky Point
Engineer - DC
Date - 22/06/2022

Effluent Land Application System Calculations

1. Effluent Volume Calculations

Source	Flow Allowance (l/person/day)	Initial	
		No. persons	Total Flow (l/day)
People Residing	150	4	600
TOTAL			600
TOTAL / week			4200

<- based on advice from Architect and Appendix H AS1547:2012

Note: 1. Residence uses reticulated community mains water and flow allowance makes the calculated total flow conservative as all new houses require water saving devices to comply with the QDC.

2. Soil Properties

Texture - Clay Loams
Structure - Weekly Structured
Indicative Permeability - <0.12mm/d
Indicative drainage class - Poorly Drained
Soil Category - 4 *<-----refer table M1 AS1547:2012*

3. Irrigation Area Calculations

Design Irrigation Rate (DIR) - 3.5 mm/day *<-----refer table M1 AS1547:2012*

Area Requirement (A) - Q(week) / DIR

Irrigation Area Requirement	
	sq.m.
Area	171

4. Mound Bed Area Calculations

Design Loading Rate (DLR) - 8 mm/day *<----- refer table N1 AS1547:2012 (requires further qualificiation)*

Basal Area Requirement (A) - Q(day) / DLR

Mound Bed Basal Area Requirement	
	sq.m.
Area	75

<--- ADOPTED

5. Evapotranspiration Area Calculations

Design Loading Rate (DLR) - 6 mm/day *<-----refer table L1 AS1547:2012*

Area Requirement (A) - Q(day) / DLR

Evapotranspiration Area Requirement	
	sq.m.
Area	100
Length if 4.0m wide	25

<---- would not recommend this system on a steeply sloping site

6. Absorption Trench and Beds

Design Loading Rate (DLR) - 20 mm/day *<-----refer table L1 AS1547:2012*

Area Requirement (A) - Q(day) / DLR

Absorption Trench and Bed Area Requirement	
	sq.m.
Area	30
Length if 4.0m wide	8

<---based on secondary treated effluent disposal (NOT recommended in Class 6 soils)

Notes :

1. Calculations have been based on proccedures set out in AS/NZS 1547:2012 "On-site domestic-wastewater management"

CONSULTANTS

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ENGINEERS

MANAGERS

INFRASTRUCTURE PLANNERS

DEVELOPMENT CONSULTANTS

WATER PRESSURE EVALUATION FOR DOMESTIC WATER SUPPLY

FOR

PROPOSED RESIDENCES MOSSMAN-DAINTREE ROAD ROCKY POINT

Prepared for: **Office Deicke**

Project no: **BR220116**

Date: **24th June 2022**

Revision: **01**

Revisions

Date	Issue	Revision Description	Prepared By	Reviewed By	Approved By
24.06.22	02	Final Issue	David Colmer	Karl Paton	David Colmer

It is the responsibility of the reader to verify the currency of the version number of this report. All subsequent releases will be made directly to the Client.

TABLE OF CONTENTS

1 INTRODUCTION

ACOR Consultants have been engaged by Office Deicke to prepare water assessment for the domestic water supply at 1299 Mossman-Daintree Road, Rocky Point to determine domestic water storage and pump requirements for the project.

DA conditions from Douglas Shire Council state the client must provide council with flow and pressure testing from a fire hydrant on the authority main at the front of the property to determine the available domestic water flow and pressure to site.

2 PROPOSED DEVELOPMENT

The project comprises construction of three (3) individual residences located on three (3) separate but adjoining allotments Lot 2, Lot 3 and Lot 4 of the subdivided property at 1299 Mossman Daintree Road. Each residence to be two storey and constructed on the existing building platforms provisioned when the property was subdivided.

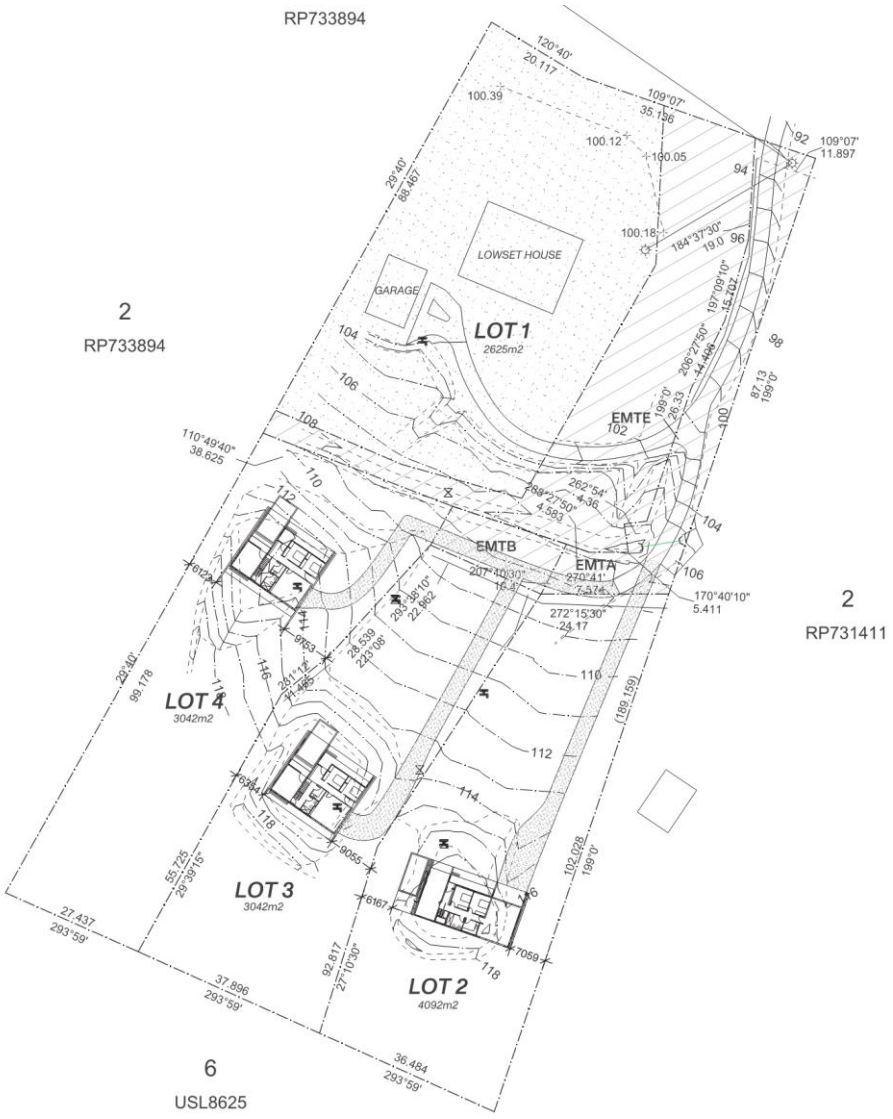


Figure 2.1 – Proposed Site Locality

3 SITE INVESTIGATION

A flow and pressure investigation was undertaken on the 30 May 2022 by Budget Fire Protection.

There is a Ø150mm water main on the opposite side of Mossman-Daintree Road. Council advised this service is to be made redundant in the future. There is a Ø225mm water main on the same side of Mossman-Daintree Road with a fire hydrant located towards the end of this main. This street hydrant was used for testing purposes.

The site has three water meters located at the north-east corner of the site which are fed via a Ø50mm branch pipe connected to the Ø225mm authority main.

To ascertain the available flow and pressure in the Ø225mm authority main, water was drawn at 5L/s increments from the fire hydrant while recording the pressure at each increment up to a maximum flow of 16L/s @ 0kPa. This was done while simultaneously recording the residual pressure at each increment at the water supply entering the property. Refer Appendix A – Flow and Pressure Testing.

4 PROPOSED SOLUTION

We note the following design parameters:

- Flow and pressure testing indicated there is 480kPa of pressure available in the authority main at static (no water being drawn).
- The authority main is located at approx. RL 91m and the most disadvantaged
- The most disadvantaged fixture in the Lot 2 residence will be at approx. RL 120m
- The most disadvantaged fixture in the Lot 3 residence will be at approx. RL 120m
- The most disadvantaged fixture in the Lot 4 residence will be at approx. RL 116m
- The minimum design pressure to be provided at fixtures is 250kPa
- The maximum design pressure to be provided at fixtures is 500kPa

It is not proposed to provide any domestic water storage at each residence noting the authority main is capable of suppling 5L/s @ 400kPa, with each residence only requiring 0.38L/s.

It is proposed to provide a domestic water pressure booster pump at each residence to ensure minimum domestic water pressures for the residences. Refer Appendix B site plan for proposed locations.

Each pump to be a Grundfos JP PT-V booster (or approved equivalent) that consists of a vertical pressure tank and a self-priming, single-stage centrifugal pump. Refer to Appendix C for pump specification and Appendix B for calculations.

Appendix A – Flow and Pressure Testing

BUDGET
FIRE PROTECTION
Quality Service to
Australian Standards

TOWNSVILLE
PO Box 1133
Oonoonba QLD 4811
Phone 4780 4339
Fax 4778 8299

BURDEKIN
PO Box 9
Brandon QLD 4808
Phone 4782 5691
Fax 4778 8299

QBSA 1126843
ABN 27 127 284 539

Accor Consultants
PO Box 3635
South Brisbane
4101
30/4/2022

Attention David Colmer

Report on 1299 Mossman Daintree Road flow readings

At the front of the property, you have a 150-mil pipe on the opposite side of the highway to the property.

On the same side as 1299 you have a 225-mil pipe that is feeding the properties.1299 has 3 water meters entering the property via a 50-mil pipe.

The water authority officer for the shire said that the 150-mil pipe will become redundant due to age and condition.

He advised that we would be wasting our time taking readings from this main.

There is a hydrant nearly at the end of the 225-mil pipe line so I connected my flow meter up to it and discharged water at 5 litres per second up to a maximum flow of 16 litres per second where the pressure was 0 at my flow meter.

The council fellows took pressure readings going into the property as follows

Flow meter at hydrant (close to the end of the line)		Pressure readings going into 1299
Static 480kPa		400Kpa
5 Litres a second	440Kpa	400Kpa
10 Litres a second	300Kpa	390Kpa
15 Litres a second	120Kpa	380Kpa
16 litres a second	0Kpa	380Kpa

If you require additional information in regards to the above please ring me on 0408 279 322.

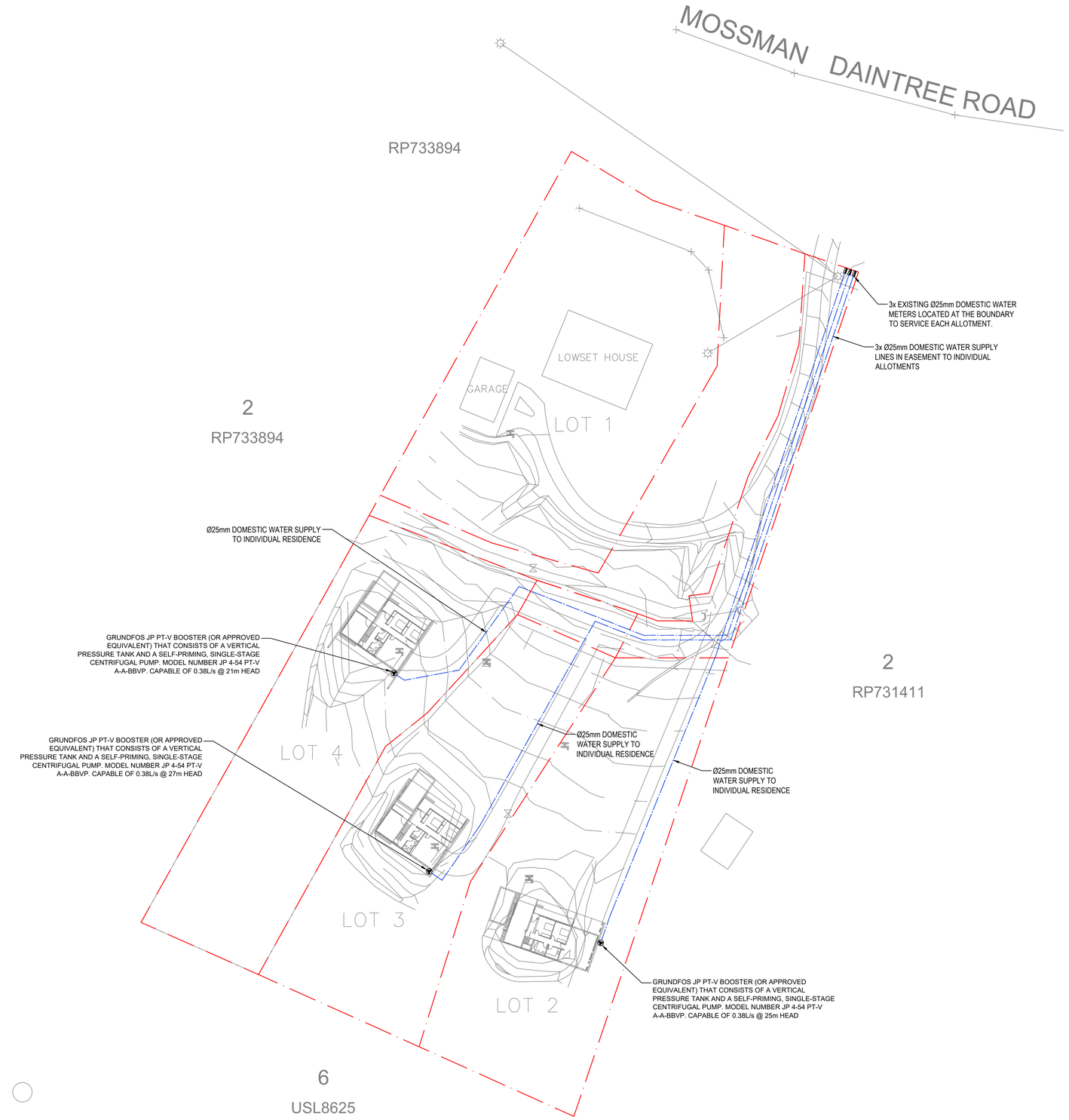
Kind Regards,

Brian Bates
Budget Fire Protection

Appendix B – Site Plan – Water Services

NOTES

1. THE WHOLE OF THE PLUMBING AND DRAINAGE WORK SHALL BE INSTALLED IN ACCORDANCE WITH QLD PLUMBING AND DRAINAGE ACT 2018, QLD PLUMBING AND DRAINAGE REGULATION 2019, AS/NZS:3500, THE LOCAL AUTHORITY APPROVED DRAWINGS, REQUIREMENTS & COMPLIANCE PERMIT CONDITIONS.



EXISTING SERVICES

SERVICES SHOWN AS EXISTING HAVE BEEN INTERPOLATED FROM RECORD DRAWINGS. CONTRACTOR TO VERIFY LOCATIONS AND LEVELS PRIOR TO COMMENCEMENT OF WORK.

0 10 20 30 m

SCALE 1:1000 @ A3 / SCALE 1:500 @ A1

NOT FOR CONSTRUCTION

This drawing has been assigned an electronic code that signifies the drawing has been checked and approved by:

Issue	Description	Date	Drawn	Approved
01	FOR APPROVAL	24.06.22	CC	DC

1cm at full size

North

Client: DEBELL PROPERTY TRUST

Architect
OFFICE Deicke
46 Little La Trobe Street
Melbourne, VIC 3004
PHONE : 0438 182 712

ACOR CONSULTANTS
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Level 7, 22 Cordelia Street
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T +61 7 3844 5900
ENGINEERS | MANAGERS | INFRASTRUCTURE PLANNERS | DEVELOPMENT CONSULTANTS

Project: MOSSMAN HOUSES
1295 MOSSMAN - DAINTREE ROAD
ROCKY POINT, QLD 4873

Drawing Title: HYDRAULIC SERVICES
SITE PLAN - WATER LAYOUT

Drawn	Date	Scale A1	Q.A. Check	Date
CC	JUN 2022	1:500	-	-
Designed	Project No.		Dwg. No.	Issue
DC	BR220116		H3.01	01

P:\BR220116\03 Mossman Housed\Drawings\CAD\H\Drawings\BR220116 H3.01.dwg
Jun 24, 2022 - 4:36pm

Appendix C – Pump Specification

Company name:
Created by:
Phone:

Date: 24/06/2022

Qty.	Description
1	**JP 4-54 PT-V A-A-BBVP**

Note! Product picture may differ from actual product

Product No.: 99463896

Grundfos JP 4-54 PT-V consist of a Grundfos JP pump, a pressure switch, a pressure gauge and a Grundfos GT-H 18-litre vertical diaphragm pressure tank. The pressure tank reduces water hammer in the pipework.

The JP 4-54 PT-V provides the comfort of constant water pressure with automatic start and stop.
This is controlled by the pressure switch and pressure tank combined ensuring optimal start/stop of the booster set according to demand.
The pressure tank limits the number of start/stop routines, as water stored in the tank can be used without starting the pump in cases of low water consumption or leakage loss.
The cut-in pressure is set to 2.2 bar.

The design is robust and built upon corrosion-free materials to ensure a long lifetime.
This booster set ensures optimum self-priming properties, featuring a suction-lift up to 8 meters.
The self-priming pump also ensures a stable operation as is it able to lift liquid from below the inlet level and can handle a mix of air and liquid until the pump reaches a fully-primed pumping condition.

The JP 4-54 PT-V booster set has built-in thermal protection, which immediately stops the pump if it overheats. The motor is air cooled and equipped with oversized, sealed, greased-for-life ball bearings to ensure silent operation and minimum service.

Liquid:	
Pumped liquid:	Water
Liquid temperature range:	0 .. 40 °C
Density:	998.2 kg/m³
Technical:	
Actual calculated flow:	1.021 l/s
Resulting head of the pump:	21 m
Primary shaft seal:	BBVP
Approvals:	CE,WM,C-TICK
Curve tolerance:	ISO9906:2012 3B
Adjustable start pressure:	Y
Start pressure:	1.0 - 5.0 bar
Rated speed:	2800 rpm
Materials:	
Pump housing:	Stainless steel EN 1.4301 AISI 304
Impeller:	Composite
Installation:	
Minimum ambient temperature:	0 °C

GRUNDFOS

Company name:
Created by:
Phone:

Date: 24/06/2022

Qty.	Description	
	Max. ambient:	40 °C
	Maximum operating pressure:	PN 6 bar
	Pump inlet:	G 1
	Pump outlet:	G 1
	Electrical data:	
	Power input - P1:	1130 W
	Rated power - P2:	0.746 kW
	Mains frequency:	50 Hz
	Rated voltage:	1 x 230 V
	Rated current:	5.1 A
	Starting current:	17.8 A
	Rated speed:	2800 rpm
	Capacitor size - run:	16 µF/450 V
	Enclosure class (IEC 34-5):	IP44
	Insulation class (IEC 85):	F
	Length of cable:	1.5 m
	Type of cable plug:	AUS
	Tank:	
	Volume of pressure tank:	18 l
	Others:	
	Net weight:	18 kg
	Gross weight:	19 kg
	Country of origin:	CN
	Custom tariff no.:	8413709062

Appendix D – Calculations

LOT 2 RESIDENCE CALCULATIONS

Cold Water Pressure Calculations

Job Name: Mossman Houses	Job No: BR220116	Date: 23.06.22
Minimum Pressure in Main at design flow rate:	470.88 m/head	4619.333 kPa
Design Flow Rate:	0.38 L's	
Approximate RL of Main:	91 m	892.71 kPa
Pressure Loss through backflow:	5.1 m/head	50 kPa
RL of most disadvantaged point:	120 m	1177.2 kPa
RL of most advantaged point:	114 m	1118.34 kPa
Minimum required pressure:	22.4 m/head	250 kPa
Pressure Loss From Main to Meter:	5.2 m/head	50.96 kPa
Pressure Loss After WaterMeter and backflow:	8.39 m/head	82.30 kPa
Pressure loss at Water main Connection Point:	5.16 m/head	50.60 kPa
Total Pipe Losses:	18.74 m/head	183.86 kPa
Residual Pressure:	-25.23 m/head	-247.47 kPa
Is a Pump Required:	**Pump is Required**	
Pump Flow:	**0.38 L's**	
Pump Head:	**25 m/head**	247 kPa
Pressure at most advantaged point with Pump running:	45 m/head/static	443 kPa/Static
Pressure at most advantaged point without Pump running:	6 m/head	61 kPa
Minimum pressure provided at most disadvantaged Point:	25.5 m/head	250 kPa

LOT 3 RESIDENCE CALCULATIONS

Cold Water Pressure Calculations

Job Name: Mossman Houses	Job No: BR220116	Date: 23.06.22
Minimum Pressure in Main at design flow rate:	470.88 m/head	4619.333 kPa
Design Flow Rate:	0.38 L's	
Approximate RL of Main:	91 m	892.71 kPa
Pressure Loss through backflow:	5.1 m/head	50 kPa
RL of most disadvantaged point:	120 m	1177.2 kPa
RL of most advantaged point:	114 m	1118.34 kPa
Minimum required pressure:	22.4 m/head	250 kPa
Pressure Loss From Main to Meter:	5.2 m/head	50.96 kPa
Pressure Loss After WaterMeter and backflow:	9.77 m/head	95.80 kPa
Pressure loss at Water main Connection Point:	5.16 m/head	50.60 kPa
Total Pipe Losses:	20.12 m/head	197.36 kPa
Residual Pressure:	-26.60 m/head	-260.97 kPa
Is a Pump Required:	**Pump is Required**	
Pump Flow:	**0.38 L's**	
Pump Head:	**27 m/head**	261 kPa
Pressure at most advantaged point with Pump running:	47 m/head/static	456 kPa/Static
Pressure at most advantaged point without Pump running:	5 m/head	48 kPa
Minimum pressure provided at most disadvantaged Point:	25.5 m/head	250 kPa

LOT 4 RESIDENCE CALCULATIONS

Cold Water Pressure Calculations

Job Name: Mossman Houses	Job No: BR220116	Date: 23.06.22
Minimum Pressure in Main at design flow rate:	470.88 m/head	4619.333 kPa
Design Flow Rate:	0.38 L's	
Approximate RL of Main:	91 m	892.71 kPa
Pressure Loss through backflow:	5.1 m/head	50 kPa
RL of most disadvantaged point:	116 m	1137.96 kPa
RL of most advantaged point:	112 m	1098.72 kPa
Minimum required pressure:	22.4 m/head	250 kPa
Pressure Loss From Main to Meter:	5.2 m/head	50.96 kPa
Pressure Loss After WaterMeter and backflow:	8.39 m/head	82.30 kPa
Pressure loss at Water main Connection Point:	5.16 m/head	50.60 kPa
Total Pipe Losses:	18.74 m/head	183.86 kPa
Residual Pressure:	-21.23 m/head	-208.23 kPa
Is a Pump Required:	**Pump is Required**	
Pump Flow:	**0.38 L's**	
Pump Head:	**21 m/head**	208 kPa
Pressure at most advantaged point with Pump running:	43 m/head/static	423 kPa/Static
Pressure at most advantaged point without Pump running:	8 m/head	81 kPa
Minimum pressure provided at most disadvantaged Point:	25.5 m/head	250 kPa